The Epi Manual

Guide to Surveillance, Investigations, and Reporting

Guide to Surveillance, Investigation, and Reporting

A publication of the Iowa Department of Public Health

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Comments, questions and suggestions regarding this reference manual are welcome. Please direct correspondence to:

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*Note: In general, it is STRONGLY recommended that health professionals NOT rely on printed copies of the Epi Manual. Anyone considering updating a "paper copy" of the Epi Manual may want to consider printing out the entire manual as **most** chapters during this review have grammar, statistical or new terminology corrections, revised review dates as well as the edits listed below. All fact sheets were reviewed and almost all have edits. Included in detail here are edits of a more substantial nature.*

General Contact Information

The following contact information maps were replaced with new versions in this section:

Public Health Epidemiologists

Disease Prevention Specialists

Child care Consultants

Community Health Consultants

State Veterinarians

Reportable Disease Information

Cyclospora
Edits to "Responsibilities" for investigation

E. coli
Many edits to classification of the various types of E. coli throughout the chapter.
E. coli Fact sheet was replaced

Hepatitis B - Maternal
All materials updated and replaced, primarily for the IDPH contact information.

Legionella
Laboratory information section replaced with updated information on legionella testing.

Meningitis
The Entire chapter has undergone grammar and other small edits. The most substantive changes are in Child Care Contacts

Polio
Edits made to the following sections and HP Fact Sheet:
Epidemiology
Protection of Contacts of a Case
Polio Vaccine and Travel

Plague
The Epidemiology section replaced with updated information.

Q Fever
Edits to "Responsibilities" for investigation

Rubella
Added comments to “Protection of Contacts” in this chapter.

Salmonella
The entire chapter has undergone edits to grammar and IDSS instructions

Shigella
The entire chapter has undergone edits to grammar and IDSS instructions. Child care investigations has important changes. In addition, edits to investigation of food handlers, fact sheet etc.

Syphilis
Laboratory information section replaced with updated information on syphilis testing.

Tetanus
Edits to Epidemiology section

Tuberculosis
New Tuberculosis Patient info sheet

Typhoid Fever
New language added to section on food handlers, and restrictions with diagnosis.
Epidemiology information updated
Fact sheet updated also

Viral Hemorrhagic Fever
Edits to Reservoirs, incubation period, and epidemiology

Law Changes
New Iowa Code 139A
New Iowa Code 141A
New IAC 641.1
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Glossary - food handler definition added.

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Lung Disease – Dr. Russell K. Brynes
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Iowa Department of Public Health

Mission & Vision Statements

Mission:

Promoting and protecting the health of Iowans

Vision:

Healthy Iowans living in healthy communities

One of the goals of public health professionals at the local and state level, in cooperation with private health professionals across the State of Iowa, is to prevent epidemics and the spread of disease. Strategies used to achieve this goal include monitoring for infectious diseases, detecting and investigating these diseases and providing disease prevention and control services. Members of this local, state and private medical "team" are in critical positions to deter potential public health threats due to communicable diseases. An effective surveillance system and prompt evaluation and response by the "team" are essential to the control of disease.

The purpose of this manual is:

1. To be a reference for all health care providers at the time of a suspected case, a particular disease or condition, or at the time of an outbreak of a communicable disease to institute public health prevention and control measures.

2. To assure more rapid and appropriate responses to situations that present danger to high-risk populations or the population at large.

3. To standardize the reporting and investigation of communicable diseases throughout the state.

4. To clarify the roles of the public and local providers and to optimize the surveillance of a population when a communicable disease(s) occur.

The book Control of Communicable Diseases Manual, Heymann, D., MD, Editor; Nineteenth Edition, 2008, (an official report of the American Public Health Association*) may also be consulted about disease investigation or follow-up.

If there are questions for which this manual or the Control of Communicable Diseases Manual does not provide answers, please contact the Iowa Department of Public Health, Center for Acute Disease Epidemiology (CADE) anytime at (800) 362-2736 or (515) 242-5935.

Introduction

Purpose of *Guide to Surveillance, Investigation, and Reporting*: Infectious diseases are a continuing threat to all people, regardless of age, gender, lifestyle, ethnic background, or socioeconomic status. They cause illness, suffering and even death, and place an enormous financial burden on society. Although modern advances have controlled some infectious diseases, new ones are constantly emerging. State public health officials rely on local public health agencies, healthcare providers, laboratories and other public health personnel to report the occurrence of notifiable diseases. Without such data, trends cannot be accurately monitored, unusual occurrences of diseases (such as outbreaks) might not be detected or appropriately responded to, and the effectiveness of control and prevention activities cannot be evaluated.

The Iowa Department of Public Health (IDPH), Center for Acute Disease Epidemiology (CADE) is placing increased emphasis on strengthening infectious disease surveillance and response. This reference manual is part of the IDPH focus on providing more training and technical assistance to local public health agencies and healthcare facilities. The purpose of this manual is to guide local public health agencies and healthcare providers through specific surveillance and reporting responsibilities for the diseases reportable to the IDPH. For more specific information on surveillance and reporting of reportable diseases, contact CADE (800) 362-2736.

The manual is arranged alphabetically by reportable disease, with each disease in its own chapter. While this manual is targeted to local public health agency personnel and infection preventionists, other healthcare professionals can also use the information to facilitate their understanding of communicable diseases. The private provider and laboratory responsibility in reporting and surveillance is a vital and collaborative piece in acquiring timely and accurate information for assuring healthy Iowa communities.

The terms "local public health agency" and "local health department" are used interchangeably.

"You" and "your" refers to the people/audience for whom this manual is intended, namely, personnel of local public health agencies and local health departments and infection preventionists from health care facilities.

All information in this manual must be considered in light of newer information available after publication. The three-ring binder format of this manual allows for addition of new and updated material as they become available. The web based version of the manual will have the most current information.

Organization

The Iowa Department of Public Health is a division of state government. The Division of Acute Disease Prevention and Emergency Response, and the Division of Environmental Health and Bureau of Health Statistics are located within IDPH, and are housed at the Lucas State Office Building in Des Moines, Iowa.

The Iowa Reportable Disease Surveillance System

A. What is surveillance? Disease surveillance is the regular collection, monitoring and analysis of data relevant for control and prevention of diseases. The data is used to define baseline levels of disease. By knowing the baseline, one may then identify unusual occurrences of disease.

The purposes of infectious disease surveillance are to interrupt transmission of disease to susceptible persons and to reduce morbidity and mortality through:

- Timely reporting,
- Identification and investigation of individual cases and outbreaks, and
- Interpretation of investigative data and dissemination of findings

Surveillance is often categorized into two types: "active surveillance" and "passive surveillance."
Active Surveillance: An active surveillance system is one in which public health officials regularly solicit disease reports. This is often accomplished by regularly (daily, weekly, bi-weekly) telephoning selected individuals and asking if specific diseases have been identified. The reports are generally solicited from health care providers, infection preventionists, laboratories, schools, minor emergency clinics, etc. This type of system has been shown to double the number of reports of some diseases.

In the case of active surveillance, the organization receiving information takes *direct* action in collecting this information. This may occur through direct review of medical records, laboratory records, or screening of high-risk populations.

Passive Surveillance: A passive surveillance system, such as Iowa has, is one in which reporting is left to individuals (i.e. physicians, nurse practitioners, physician assistants, infection preventionists, laboratories, etc.). Passive surveillance is the most common type of surveillance used in state and local health departments. The two major limitations of this type of system have been under reporting and delayed reporting.

Traditional reporting of diseases by healthcare providers and laboratories is considered passive surveillance. This means that the organization receiving the information waits for initial data on a case to be submitted. This usually leads to collection of additional information and the implementation of follow-up activities. An example of this would be when a local public health agency receives a report of invasive *Neisseria meningitidis* infection from a healthcare provider or facility and then initiates patient interview and contact tracing with recommendations on post-exposure prophylaxis.

A sub-category of passive surveillance is "enhanced passive surveillance." In this situation, the organization receiving data works closely with healthcare providers and laboratories that are most likely to report a particular disease or group of diseases and sets up systems to increase timeliness and completeness of reporting.

Guide to Using the Specific Disease Format: The format chosen for describing the specific diseases is designed to make the information easy to read and to orient the reader with terminology specific for communicable disease investigation. The following information defines the headings used and provides helpful hints in interpreting the information included in the specific disease sections.

Synonyms: Some disease names have changed over time, and some health professionals or laypersons may describe the disease by other terms.

Agent: The specific pathogen that produces the disease. Whether the agent is bacteria, virus, fungus, parasite, or other organism, it is important to refer to it appropriately when conversing with health professionals or the public. If the agent is an insect (e.g., lice) producing an infestation, the appropriate terminology for the problem is infestation, not disease or infection.

Reservoir: The normal habitats where the infectious agent can live, multiply, and reproduce. These habitats can include man, animals, or the environment.

Mode of Transmission: The direct (person-to-person or animal-to-person) or indirect (through vehicles such as food or water, vectors, etc.) transfer of an infectious agent from a reservoir to a susceptible host. The reservoir and mode of transmission are integrally related and the specific information about them should direct the types of questions asked during the case investigation. Let's take the example of two enteric diseases, salmonellosis and shigellosis. The reservoir for *Salmonella* includes domestic and wild animals and man. The mode of transmission is most often by ingestion of contaminated food, but also may be by the fecal-oral route resulting from contact with infected animals or persons. Having this information, the case investigation to determine the source must include a complete food history and investigation of possible ways persons and animals could transmit the organism via their feces. For *Shigella* the only reservoir is man and the mode of transmission is the fecal-oral route. In this instance, the case investigation to determine the source centers only on the possible ways that a person(s) can transmit the organism via their feces. No history about animals is necessary.

Incubation Period: The interval between exposure to an agent that results in infection and the appearance of the first symptom of illness. There will be a range (shortest - longest) and an average incubation period for each disease.

When investigating the occurrence of a specific disease, the shortest and longest incubation periods should compose the time frame in question. For example, the incubation period for hepatitis A is 15-50 days, average 28-30. When interviewing the case, you should ask, "In the 15-50 days (2-6 weeks) before you became ill . . ." or preferably use specific dates. For example, if the person with hepatitis A had onset of symptoms on February 14, ask about specific exposures from January 1-30.

Period of Communicability: The time during which a person or animal with an infectious disease is a potential source of infection. Period of communicability is important when assessing the risk that the case under investigation may have transmitted his/her disease to others. For example, when investigating a case of hepatitis A, request the names of "contacts" in the 2 weeks prior to and 1 week after the onset of illness (the period of communicability for hepatitis A).

Clinical Illness: The symptoms commonly associated with a particular disease. If specific laboratory testing is not completed, a good clinical history of signs (objective physical findings) and symptoms (experienced by the patient) are necessary to determine the likelihood of diseases for which follow-up would be indicated.

Diagnosis: The use of scientific and skillful methods to establish the cause and nature of a person's disease. Cases may be grouped as follows:

- Confirmed: A person who has a laboratory-confirmed infection with a particular agent. The person may have clinical symptoms or the infection may be sub clinical (asymptomatic). Sub clinical disease can only be diagnosed by laboratory testing.

- Probable: A person with clinical symptoms of a disease (but no laboratory confirmation) who is a contact to a laboratory-confirmed case or is associated with a documented outbreak. The case is then epidemiologically linked.

- Suspect: (frank, apparent) A person with a clinical syndrome suggesting a particular disease. Epidemiologically, this refers to a case which is not (yet) either laboratory confirmed or epidemiologically linked.

Prevention: Slowing or stopping the occurrence of disease. This may include direct intervention by the public health or educating the cases and contacts about the disease, how it is transmitted and how to prevent transmission.

Glossary: A glossary of other pertinent terms can be found at the end of this manual.

Investigation of Communicable Diseases: Not every disease reported requires a detailed follow-up. Diseases are to be reported by health care providers, laboratories, infection preventionists, school nurses, local health department personnel, and can be reported by private citizens.

Confirmation: The first step taken before any action is initiated is to confirm the diagnosis (if at all possible). If the disease is being reported by a physician or infection preventionists, confirmation in most instances is obtained by requesting information on specific laboratory tests to confirm the diagnosis.

When a disease that requires public health follow-up is reported by a private citizen, confirmation requires contact with the appropriate physician, laboratory, or both, and requesting specific test results used to make the diagnosis. If the diagnosis is a clinical diagnosis without laboratory confirmation, it is sometimes necessary to request a clinical history in order to determine if the illness is consistent with the diagnosis. If the symptoms are not consistent with the diagnosis, contact the Center for Acute Disease Epidemiology (CADE) at (800) 362-2736 for recommendations.

Case Investigation: Case investigation involves determining possible sources of the person's infection, assessing the likelihood that the individual will transmit the infection to others, and providing education regarding prevention of further spread to the ill person and their contacts. This may lead to investigation of the possible source and/or other cases.

Critical factors in any case investigation include:

- **Timely response to the initial disease report**. Investigation of diseases requiring follow-up should be initiated within 24 hours.

- **Collection of appropriate data needed to make an accurate assessment**. Prior to interviewing, review material related to the specific disease. Critical information to

consider when collecting data is the reservoir(s), incubation period, mode of transmission, period of communicability and appropriate control measures necessary for the disease.

- **Follow-up of leads regarding a possible source of infection**.

Example: An adult with shigellosis reports his child had fever and diarrhea a few days earlier and the child attends a child care center. An appropriate response would be to visit the child care center to evaluate if other children in the center are, or have been, ill with fever and diarrhea.

Intervening appropriately to interrupt transmission and prevent disease.
Example: A patient with salmonellosis reports that she had eaten at a local food establishment with a large group and several members of the group had become ill with fever and diarrhea. While you are taking food histories on all ill persons, an environmental health specialist/sanitarian should be consulted to visit the food establishment to conduct an inspection, gather necessary information, and collect food samples if warranted.

Accurate documentation of information obtained.
Complete information regarding any case investigation should be recorded in a neat, organized manner and filed. Case investigations should either be filed in a communicable disease file (for example: Hepatitis A Cases - 1985), in a patient file (by patient name) or entered into the Iowa Disease Surveillance System (IDSS), Iowa's secure web-based disease reporting system. If the patient file is used, a log of all case investigations performed in the county should be kept. The record should not only include information given to you about the case but also any recommendations, instructions and education that was provided to the case. Recording should be done as information is obtained or service given. **Do not rely on your memory.**

Legal Basis: Reporting of communicable diseases is required under Iowa Code Chapter 139A. These laws are implemented by regulation under Iowa Administrative Code Chapter 641.1 The purpose of these regulations is "to list those diseases declared dangerous by the Iowa Department of Public Health, and to establish reporting, isolation, and quarantine requirements. This is intended for use by local public health agencies, hospitals, healthcare providers, laboratories, educational and recreational program health officials, food industry officials, and the public."

Infectious diseases designated as a threat to the public health must be reported directly to the local public health agency and the Iowa Department of Public Health. The only exceptions to this are sexually transmitted diseases, tuberculosis, and HIV/AIDS, which are reported directly to the IDPH. Local public health agencies or their designees are authorized to accept, investigate and submit reportable disease case information to IDPH, Center for Acute Disease Epidemiology (CADE).

Reporting of Tuberculosis: Healthcare providers, laboratories, or local public health agencies who have knowledge of a case of confirmed tuberculosis (TB) or clinically suspected tuberculosis case shall notify the Tuberculosis Program within 24 hours. Upon receipt of such notice, the TB Program shall notify the local public health agency within 24 hours. This notice shall include the case name, date of birth, age, sex, case address, and provider name and provider phone number. For more information, local public health agencies should contact the

TB Program directly at (515) 281-7504.

Reporting of HIV/AIDS: HIV and AIDS (as determined by a laboratory test diagnostic of HIV infection or AIDS) are reportable directly to the IDPH, HIV/AIDS Surveillance Program. Perinatal exposures to HIV (i.e., births to HIV-infected women) are also reportable, as are deaths of persons with HIV/AIDS. Reporting is to be done by healthcare providers, laboratories, and other officials using the HIV/AIDS Case Report Form developed and approved by the IDPH. Because information beyond what can be captured in the Iowa Disease Surveillance System is needed for HIV/AIDS reports, reporting through IDSS will prompt the HIV/AIDS Surveillance Office to send the initial reporter the case report form to complete reporting. Local public health agencies should contact the HIV/AIDS Surveillance Program directly at (515) 242-5141 to obtain a case report form or if there are any questions regarding reporting of HIV/AIDS.

Reporting of STDs: Cases of certain sexually transmitted diseases (STD), as determined by a clinical diagnosis and/or from laboratory evidence of an infection, are reportable directly to the IDPH, STD Prevention Program. Specifically, Syphilis, Gonorrhea, and Chlamydia are reportable. Reporting is accomplished by clinicians, laboratories and other officials designated by the IDPH using a form or format approved by the IDPH or by reporting through the Iowa Disease Surveillance System. When using IDSS to report STDs, providers should indicate any treatment provided in the NOTES tab because the follow-up form is closed from view due the partner services information located within it. Local public health agencies, clinicians and laboratories can contact the STD Prevention Program directly at (515) 281-3031.

Reportable sexually transmitted diseases include chlamydial infection, syphilis, and gonorrhea. Minors may give consent for STD prevention, tests, and treatment without parental consent or notification. Case investigation will be conducted by trained disease prevention specialists at the state or local level.

Reporting and Case Investigation; State versus Local Role: CADE collaborates with local public health agencies and health care facilities in the investigation of cases of communicable disease and the implementation of appropriate control and prevention measures. The guidelines in this manual, as well as other referenced material, form the basis for local public health agency communicable disease reporting, investigation and control measures.

When clusters or outbreaks of illness, potential bioterrorist agents, emerging infections or other serious threats to public health are identified, IDPH will provide technical assistance to local public health agencies. IDPH assistance may range from serving in a medical consulting capacity to direct management of the investigation, implementation of control and prevention measures, and initiating follow-up activities. In special situations, IDPH may request technical assistance from the Centers for Disease Control and Prevention (CDC). (**Note**: Requests for CDC technical assistance must be made by the IDPH.)

When an institution such as a healthcare facility or a school is the site of possible transmission, the infection preventionist of the healthcare facility or the school nurse is typically actively involved in the investigation and the application of control and prevention measures. Ideally decisions about control measures are made collectively by the IDPH, the local public health agency, and the infection preventionist (or equivalent) in the affected institution. However, IDPH and the local board of health working together have ultimate authority.

Timeliness of Reporting: Cases of diseases reportable to IDPH are reported to CADE. Certain diseases should be **immediately reported by phone** to the IDPH when a suspect or confirmed case is identified. Diseases that require immediate reporting should always be prioritized above other case investigations. In addition, any disease where a cluster exists or where there is a suspected cluster or outbreak of disease should be reported immediately and prioritized accordingly. Post investigation, the local public health agency can follow up with the official case report form(s). All diseases that are not categorized as "immediate" should be reported as outlined in IAC 641.1 and investigated within a week and a completed case report form with appropriate laboratory test confirmation (if applicable for the disease) should be submitted preferably through the IDSS.

Note: Local public health agencies (LPHA) are responsible for residents of their county. Reports of illness received for residents of other cities/towns outside of the county should be forwarded to CADE or the appropriate LPHA.

The importance of timely reporting cannot be overemphasized. For example, if a local health authority holds reports of salmonella and only submits them once a month, a potential outbreak occurring across city/town limits may go unnoticed and uncontrolled.

The Center for Acute Disease Epidemiology (CADE) has an epidemiologist available during normal business hours (515) 242-5935 or (800) 362-2736 to answer questions about case investigation and control measures. Surveillance information is available during normal business hours at (515) 281-6493 for questions about reporting requirements. For disease reporting please call the Disease Reporting Hotline at (800) 362-2736. A medical epidemiologist is also available during non-work hours and weekends for emergency situations *e.g.,* if you receive several complaints and are concerned about a potential foodborne illness outbreak. All calls are returned promptly.

Examples of top priorities include:

- Clusters of illness
- Diseases that require prompt administration of countermeasures to prevent further spread and/or to reduce morbidity and mortality (*e.g.,* rabies, hepatitis A, or meningococcal invasive disease)
- Diseases with high mortality rates (*e.g.,* eastern equine encephalitis)
- Suspect bioterrorist agents (*e.g.,* anthrax or smallpox)
- Diseases that are unusual in the infected individual's demographic group or within a geographic region
- Disease with a high potential for spread to others (*e.g.,* measles)

Note*:* To help local public health agencies distinguish those diseases that pose a more serious public health threat, certain chapters have been flagged. These disease chapters have a box with the notation "Report Immediately" at the top of the first page. If you are unsure about which investigations to do first, or need technical assistance, contact the epidemiologist on-call at (800) 362-2736.

Confidentiality

Confidentiality is a legal requirement. The information that public health officials collect is often personal. Success and cooperation lies in protecting an individual's right to privacy. It is important to realize that confidentiality concerns extend beyond the investigator. Clerical staff,

administrative staff, interns and local public health agency members who may be aware of personal information on a case should all be familiar with and mindful of the basic tenets of maintaining confidentiality. Only individuals who have a "need to know" should have access to sensitive records. During and after an investigation, only those individuals directly involved in interviewing a case or contacts and/or those directly involved in follow-up activities to control the spread of the disease, fall into the category of "need to know." This category would normally not include general administrators, town officials, elected officials and others involved in town government who are not directly providing disease control services. Individuals assisting in general education to the public also have no need to know personally identifying information about a case.

If you are unsure about whether it is appropriate to release information, ***do not release it!*** Check with a supervisor, the municipal attorney or legal advisor, or contact the Center for Acute Disease Epidemiology at (515) 242-5935 or (800) 362-2736 for advice. Make sure information is released only to people who are authorized to receive it. Do not be pressured into a hasty decision. Do not confirm an individual case unless you are certain it is appropriate to release that information. If you are unsure about who is requesting information, obtain confirmation of the requestor's identity before releasing information *i.e.,* a signed consent form with documented identification such as a driver's license; for guardians, documentation of guardianship. Inappropriate release of data could pose a liability threat to your agency and/or municipality and possibly endanger affected individuals.

It is important to realize that information may be shared between local public health officials, healthcare providers, and with IDPH during the course of a public health investigations and control activities. However, even in these instances "need to know" applies. Information on individual cases may be obtained from IDPH Center for Acute Disease Epidemiology (CADE) only by the responsible representative of a local public health authority involved in an investigation of the case, the person who is the case, the health care provider involved, or the individual's guardian or designee (with written informed consent).

The IDPH strongly encourages local public health agencies to acquire a secure fax machine for the use of individuals involved in communicable disease reporting, investigation and control. This machine should be located in a secured area where disease control staff work and should not be accessible to the general public. Communicable disease control personnel's use of a fax machine shared by many personnel in town government presents a heightened risk for breach of confidentiality.

Remember the type of information released cannot personally identify a case. What facts could be released can change with each situation. For example, demographic information such as age, race, sex, or zip code could or could not be used depending how large the outbreak is, and whether it can be traced back to an individual case. The rule remains that if released information can identify or be traced back to an individual case, the information should not be released.

Local and state public health authorities have investigated cases of infectious disease and collected sensitive information for more than 100 years. These efforts would not be as successful if all personnel did not uphold the public's trust by maintaining strict confidentiality.

Important Points Regarding Confidentiality

- Everyone with access to case information is required to maintain confidentiality.
- Confidential information can be released only to those who "need to know."
- Be certain of the identity of the person to whom you release confidential information. Insist on confirmation of identity *e.g.* copy of driver's license, if unsure.
- Maintain confidentiality during reporting. If reporting by fax, be certain that the receiving number is a confidential fax *e.g.,* (515) 281-5698 is the number of the Center for Acute Disease Epidemiology, Surveillance Program confidential fax. When receiving information by fax to your office, confidentiality also must be maintained.
- Personally identifying information from case report forms and other forms **cannot be released** without the individual's signed consent, except to those directly involved in case investigation, control and prevention who have a "need to know."

Reporting by Clinicians: Throughout the country, reporting of diseases by clinicians is variable. Clinicians are more likely to report disease with high mortality or diseases spotlighted in local and national media. Some strategies to increase reporting by clinicians include:

- Education on the importance of reporting.
- Appropriate mechanisms for reporting.
- Identification of professional or support staff who work with clinicians and who are able to take on the responsibility for reporting of clinician-diagnosed reportable disease.
- Prioritization of reportable diseases that pose a more serious risk to public health.

Note: Local public health agencies (LPHA) having difficulty obtaining information from clinicians should contact the Center for Acute Disease Epidemiology at (515) 242-5935 for assistance. Also, sample letters outlining the roles and responsibilities of the local public health agency for use with healthcare providers and patients are available in disease specific chapters.

An important strategy to improve reporting by healthcare providers is to develop better working relationships with those in your jurisdiction through education, provision of reports on public health activities and disease data, and by asking for their participation in timely public health initiatives. This includes such things pandemic influenza planning, or a bioterrorism response and/or surveillance planning for emerging infections.

Healthcare providers do not always inform patients that a disease is reportable to local or state health departments. This may lead to distress in a patient when they are contacted for a case investigation. Healthcare provider education on this issue is a good strategy for LPHAs. The LPHA should ask when the test results and diagnoses were communicated to a patient. It is usually best to begin an investigation by contacting the reporting clinician.

Laboratory Reporting: Laboratory results are often reported directly to the IDPH from laboratories. This has led to more timely disease reporting. IDPH sends these laboratory results to LPHAs for follow-up using the Iowa Disease Surveillance System (IDSS). Some laboratories batch their test results and submit them periodically, potentially leading to long delays in receipt and identification or confirmation of cases. IDPH is working to eliminate this situation through laboratory education and the implementation of electronic laboratory data transmission via IDSS. The University of Iowa State Hygienic Laboratory (SHL) reports directly into IDSS. As

time progresses IDPH will reach out to additional laboratories to initiate secure electronic data submission.

Current laboratory systems often are not equipped to collect much of the information needed, nor are they linked directly to clinical/patient information systems. As hospital and laboratory databases become more integrated, better demographic information will become available. IDPH currently attempts to gather additional information when patient information is too limited to allow local public health agency follow-up.

Sentinel Surveillance and Reporting of Selected Diseases: In addition to passive, enhanced passive and active surveillance, IDPH has several "sentinel" surveillance projects. The primary purpose of sentinel surveillance is the initial and/or representative detection of disease, whether it is emergent or recurrent. This requires that the organization receiving data work closely with a select number of sites, *e.g.,* healthcare providers, laboratories, or school nurses, to supplement standard reporting. Sentinel surveillance reporting is particularly useful in providing warning of the arrival of a disease. For diseases that are high in volume and not individually reportable, such as influenza, it can also provide estimates about the burden of disease among the general population. Sentinel surveillance and reporting may also be helpful when monitoring a disease that is newly introduced to a population, such as West Nile virus, or when providing information about a disease disproportionately affecting specific populations, such as varicella surveillance in schools.

Limitations of Data; Under-Reporting and Incomplete Data: Because most surveillance systems are based on a passive disease reporting, under-reporting is inevitable. It is estimated that, depending on the disease, only 5% to 80% of cases that actually occur will be reported. For example, foodborne illness is often underreported because individuals with disease do not consult a healthcare provider, or a diagnosis of "gastrointestinal illness" is made and treated without any diagnostic tests that might identify the particular pathogen. Even with incomplete information, it is often possible to detect key trends and/or sources of infection. For diseases that occur less frequently, the need for completeness becomes more important. Each individual case must be treated as a "key" event.

Lack of Representativeness of Reported Cases: Health conditions are not reported randomly. For example, illnesses in a healthcare facility are reported more frequently than those diagnosed by outpatient care providers. A provider is more likely to report a case of hepatitis A if the patient is ill than if the patient has few or no symptoms. A case of meningitis is more likely to be reported than a case of chickenpox. Reporting bias can distort interpretation of disease data.

Changing/Evolving Case Definitions: Different practitioners frequently use different case definitions for health problems. The more complex the disease syndrome, the greater the difficulty in reaching consensus on a case definition. With newly emerging diseases and as understanding progresses, case definitions are frequently adjusted to allow greater accuracy of diagnosis. Also, as new diagnostic tests are developed, case definitions sometimes change to incorporate these tests. Case definitions establish uniform criteria for disease reporting and are not definitive for diagnosis. The case definitions used by IDPH for disease reporting are put forth by the Council of State and Territorial Epidemiologist (CSTE) and are used nationwide for accurate comparison of disease burden across states. The case definitions can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

Bioterrorism: Bioterrorism is the intentional use of disease agents to create fear, disrupt society or cause injuries and/or death. The use of biologic agents by terrorists may involve acts that are announced or otherwise immediately recognized. Alternatively, and considered to be more likely, would be the silent introduction of a biologic agent into the population that could take days to weeks before illness becomes apparent.

Because some diseases caused by bioterrorism may initially resemble common infectious diseases, the detection of a bioterrorist event may be difficult. **Local health departments should immediately notify the epidemiologist on-call for Center for Acute Disease Epidemiology at (800) 362-2730** if any of the following are noticed:

- A cluster of illness that is unexplained after preliminary investigation
- One or more cases of disease in a community in which the disease does not normally occur
- Illness in an unusual geographic distribution *e.g.,* patients all residing in one area possibly downwind of a point-location or in an unusual population or *e.g.,* serious pneumonia among young adults.

Local communities must lead the response to a bioterrorist event, or to any infectious disease emergency. Planning, exercising plans, and communication are important and will be most effective if a strong partnership among public health, first responders *e.g.,* fire departments, emergency management, law enforcement, local health care providers and hospitals have been developed in advance.

Conclusion: The best surveillance lies in collecting accurate and timely data, and in carefully and correctly interpreting the data. The interpretation should focus on elements that might lead to control and prevention of the condition. Investigators can use surveillance as a basis for appropriate public health actions. The results of such actions can be assessed for effectiveness. This manual is designed to give an overview of local public health agency responsibility for surveillance, reporting, control, and prevention of the diseases reportable to the Center of Acute Disease Epidemiology. As experience has proved, case investigation can vary greatly from setting to setting, and it is impossible to address all the questions and situations that may arise. The Center for Acute Disease Epidemiology is available at (515) 242-5935 to offer guidance and assistance as needed.

Reportable Disease Information

CHAPTER 139A COMMUNICABLE AND INFECTIOUS DISEASES AND POISONINGS

139A.1 TITLE.

This chapter shall be known as the *"Communicable and Infectious Disease Reporting and Control Act"*.

139A.2 DEFINITIONS.

For purposes of this chapter, unless the context otherwise requires:

1. *"Area quarantine"* means prohibiting ingress and egress to and from a building or buildings, structure or structures, or other definable physical location, or portion thereof, to prevent or contain the spread of a suspected or confirmed quarantinable disease or to prevent or contain exposure to a suspected or known chemical, biological, radioactive, or other hazardous or toxic agent.
2. *"Business"* means and includes every trade, occupation, or profession.
3. *"Care provider"* means an individual who is trained and authorized by federal or state law to provide health care services or services of any kind in the course of the individual's official duties, for compensation or in a voluntary capacity, who is a health care provider, emergency medical care provider as defined in section 147A.1, fire fighter, or peace officer. *"Care provider"* also means an individual who renders emergency care or assistance in an emergency or due to an accident as described in section 613.17.
4. *"Communicable disease"* means any disease spread from person to person or animal to person.
5. *"Contagious or infectious disease"* means hepatitis in any form, meningococcal disease, tuberculosis, and any other disease, with the exception of AIDS or HIV infection as defined in section 141A.1, determined to be life-threatening to a person exposed to the disease as established by rules adopted by the department, based upon a determination by the state epidemiologist and in accordance with guidelines of the centers for disease control and prevention of the United States department of health and human services.
6. *"Department"* means the Iowa department of public health.
7. *"Designated officer"* means a person who is designated by a department, agency, division, or service organization to act as an infection control liaison officer.
8. *"Exposure"* means the risk of contracting disease as determined by the centers for disease control and prevention of the United States department of health and human services and adopted by rule of the department.
9. *"Exposure-prone procedure"* means a procedure performed by a health care provider which presents a recognized risk of percutaneous injury to the health care provider and if such an injury occurs, the health care provider's blood is likely to contact a patient's body cavity, subcutaneous tissues, or mucous membranes, or an exposure-prone procedure as defined by the centers for disease control and prevention of the United States department of health and human services.
10. *"HBV"* means hepatitis B virus.
11. *"Health care facility"* means a health care facility as defined in section 135C.1, an ambulatory surgical center, or a clinic.
12. *"Health care provider"* means a person licensed to practice medicine and surgery, osteopathic medicine and surgery, chiropractic, podiatry, nursing, dentistry, optometry, or as a physician assistant, dental hygienist, or acupuncturist.
13. *"HIV"* means HIV as defined in section 141A.1.
14. *"Hospital"* means hospital as defined in section 135B.1.

15. *"Isolation"* means the separation of persons or animals presumably or actually infected with a communicable disease or who are disease carriers for the usual period of communicability of that disease in such places, marked by placards if necessary, and under such conditions as will prevent the direct or indirect conveyance of the infectious agent or contagion to susceptible persons.
16. *"Local board"* means the local board of health.
17. *"Local department"* means the local health department.
18. *"Placard"* means a warning sign to be erected and displayed on the periphery of a quarantine area, forbidding entry to or exit from the area.
19. *"Public health disaster"* means public health disaster as defined in section 135.140.
20. *"Quarantinable disease"* means any communicable disease designated by rule adopted by the department as requiring quarantine or isolation to prevent its spread.
21. *"Quarantine"* means the limitation of freedom of movement of persons or animals that have been exposed to a quarantinable disease within specified limits marked by placards for a period of time equal to the longest usual incubation period of the disease in such manner as to prevent the spread of a quarantinable disease which affects people.
22. *"Reportable disease"* means any disease designated by rule adopted by the department requiring its occurrence to be reported to an appropriate authority.
23. *"Sexually transmitted disease or infection"* means a disease or infection as identified by rules adopted by the department, based upon a determination by the state epidemiologist and in accordance with guidelines of the centers for disease control and prevention of the United States department of health and human services.
24. *"Terminal cleaning"* means cleaning procedures defined in the isolation guidelines issued by the centers for disease control and prevention of the United States department of health and human services.

139A.3 REPORTS TO DEPARTMENT -- IMMUNITY -- CONFIDENTIALITY -- INVESTIGATIONS.

1. The health care provider or public, private, or hospital clinical laboratory attending a person infected with a reportable disease shall immediately report the case to the department. However, when a case occurs within the jurisdiction of a local health department, the report shall be made to the local department and to the department. A health care provider or public, private, or hospital clinical laboratory who files such a report which identifies a person infected with a reportable disease shall assist in the investigation by the department, a local board, or a local department. The department shall publish and distribute instructions concerning the method of reporting. Reports shall be made in accordance with rules adopted by the department and shall require inclusion of all the following information:

a. The patient's name.
b. The patient's address.
c. The patient's date of birth.
d. The sex of the patient.
e. The race and ethnicity of the patient.
f. The patient's marital status.
g. The patient's telephone number.
h. The name and address of the laboratory.
i. The date the test was found to be positive and the collection date.

j. The name of the health care provider who performed the test.

k. If the patient is female, whether the patient is pregnant.

2. *a.* Any person who, acting reasonably and in good faith, files a report, releases information, or otherwise cooperates with an investigation under this chapter is immune from any liability, civil or criminal, which might otherwise be incurred or imposed for such action.

b. A report or other information provided to or maintained by the department, a local board, or a local department, which identifies a person infected with or exposed to a reportable or other disease or health condition, is confidential and shall not be accessible to the public.

c. Notwithstanding paragraph *"b"*, information contained in the report may be reported in public health records in a manner which prevents the identification of any person or business named in the report. If information contained in the report concerns a business, information disclosing the identity of the business may be released to the public when the state epidemiologist or the director of public health determines such a release of information necessary for the protection of the health of the public.

3. A health care provider or public, private, or hospital clinical laboratory shall provide the department, local board, or local department with all information reasonably necessary to conduct an investigation pursuant to this chapter upon request of the department, local board, or local department. The department may also subpoena records, reports, and any other evidence necessary to conduct an investigation pursuant to this chapter from other persons, facilities, and entities pursuant to rules adopted by the department.

139A.3A INVESTIGATION AND CONTROL.

When the department receives a report under this chapter or acts on other reliable information that a person is infected with a disease, illness, or health condition that may be a potential cause of a public health disaster, the department shall identify all individuals reasonably believed to have been exposed to the disease, illness, or health condition and shall investigate all such cases for sources of infection and ensure that such cases are subject to proper control measures. Any hospital, health care provider, or other person may provide information, interviews, reports, statements, memoranda, records, or other data related to the condition and treatment of any individual, if not otherwise prohibited by the federal Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191, to the department to be used for the limited purpose of determining whether a public health disaster exists.

139A.4 TYPE AND LENGTH OF ISOLATION OR QUARANTINE.

1. The type and length of isolation or quarantine imposed for a specific communicable disease shall be in accordance with rules adopted by the department.

2. The department and the local boards may impose and enforce isolation and quarantine restrictions.

3. The department shall adopt rules governing terminal cleaning.

4. The department and local boards may impose and enforce area quarantine restrictions according to rules adopted by the department. Area quarantine shall be imposed by the least restrictive means necessary to prevent or contain the spread of the suspected or confirmed quarantinable disease or suspected or known hazardous or toxic agent.

139A.5 ISOLATION OR QUARANTINE SIGNS ERECTED.

When isolation or a quarantine is established, appropriate placards prescribed by the department shall be erected to mark the boundaries of the place of isolation or quarantine.

139A.6 COMMUNICABLE DISEASES.

If a person, whether or not a resident, is infected with a communicable disease dangerous to the public health, the local board shall issue orders in regard to the care of the person as necessary to protect the public health. The orders shall be executed by the designated officer as the local board directs or provides by rules.

139A.7 DISEASED PERSONS MOVING -- RECORD FORWARDED.

If a person known to be suffering from a communicable disease dangerous to the public health moves from the jurisdiction of a local board into the jurisdiction of another local board, the local board from whose jurisdiction the person moves shall notify the local board into whose jurisdiction the person is moving.

139A.8 IMMUNIZATION OF CHILDREN.

1. A parent or legal guardian shall assure that the person's minor children residing in the state are adequately immunized against diphtheria, pertussis, tetanus, poliomyelitis, rubeola, rubella, and varicella, according to recommendations provided by the department subject to the provisions of subsections 3 and 4.

2. *a.* A person shall not be enrolled in any licensed child care center or elementary or secondary school in Iowa without evidence of adequate immunizations against diphtheria, pertussis, tetanus, poliomyelitis, rubeola, rubella, and varicella.

b. Evidence of adequate immunization against Haemophilus influenza B and invasive pneumococcal disease shall be required prior to enrollment in any licensed child care center.

c. Evidence of hepatitis type B immunization shall be required of a child born on or after July 1, 1994, prior to enrollment in school in kindergarten or in a grade.

d. Immunizations shall be provided according to recommendations provided by the department subject to the provisions of subsections 3 and 4.

3. Subject to the provision of subsection 4, the state board of health may modify or delete any of the immunizations in subsection 2.

4. *a.* Immunization is not required for a person's enrollment in any elementary or secondary school or licensed child care center if either of the following applies:

(1) The applicant, or if the applicant is a minor, the applicant's parent or legal guardian, submits to the admitting official a statement signed by a physician, advanced registered nurse practitioner, or physician assistant who is licensed by the board of medicine, board of nursing, or board of physician assistants that the immunizations required would be injurious to the health and well-being of the applicant or any member of the applicant's family.

(2) The applicant, or if the applicant is a minor, the applicant's parent or legal guardian, submits an affidavit signed by the applicant, or if the applicant is a minor, the applicant's parent or legal guardian, stating that the immunization conflicts with the tenets and practices of a recognized religious denomination of which the applicant is an adherent or member.

b. The exemptions under this subsection do not apply in times of emergency or epidemic as determined by the state board of health and as declared by the director of public health.

5. A person may be provisionally enrolled in an elementary or secondary school or licensed child care center if the person has begun the required immunizations and if the person continues to receive the necessary immunizations as rapidly as is medically feasible. The department shall adopt rules relating to the provisional admission of persons to an elementary or secondary school or licensed child care center.

6. The local board shall furnish the department, within sixty days after the first official day of school, evidence that each person enrolled in any elementary or secondary school has been immunized as required in this section subject to subsection 4. The department shall adopt rules pursuant to chapter 17A relating to the reporting of evidence of immunization.

7. Local boards shall provide the required immunizations to children in areas where no local provision of these services exists.

8. The department, in consultation with the director of the department of education, shall adopt rules for the implementation of this section and shall provide those rules to local school boards and local boards.

139A.8A VACCINE SHORTAGE -- DEPARTMENT ORDER -- IMMUNITY.

1. In the event of a shortage of a vaccine, or in the event a vaccine shortage is imminent, the department may issue an order controlling, restricting, or otherwise regulating the distribution and administration of the vaccine. The order may designate groups of persons which shall receive priority in administration of the vaccine and may prohibit vaccination of persons who are not included in a priority designation. The order shall include an effective date, which may be amended or rescinded only through a written order of the department. The order shall be applicable to health care providers, hospitals, clinics, pharmacies, health care facilities, local boards of health, public health agencies, and other persons or entities that distribute or administer vaccines.

2. A health care provider, hospital, clinic, pharmacy, health care facility, local board of health, public health agency, or other person or entity that distributes or administers vaccines shall not be civilly liable in any action based on a failure or refusal to distribute or administer a vaccine to any person if the failure or refusal to distribute or administer the vaccine was consistent with a department order issued pursuant to this section.

3. The department shall adopt rules to administer this section.

139A.9 FORCIBLE REMOVAL -- ISOLATION -- QUARANTINE.

The forcible removal and isolation or quarantine of any infected person shall be accomplished according to the rules and regulations of the local board or the rules of the state board of health.

139A.10 FEES FOR REMOVING.

The officers designated shall receive reasonable compensation for their services as determined by the local board. The amount determined shall be certified and paid in the same manner as other expenses incurred under this chapter.

139A.11 SERVICES AND SUPPLIES -- ISOLATION -- QUARANTINE.

If the person under isolation or quarantine or the person liable for the support of the person, in the opinion of the local board, is financially unable to secure proper care, provisions, or medical attendance, the local board shall furnish supplies and services during the period of isolation or quarantine and may delegate the duty, by rules, to one of its designated officers.

139A.12 COUNTY LIABILITY FOR CARE, PROVISIONS, AND MEDICAL ATTENDANCE.

The local board shall provide proper care, provisions, and medical attendance for any person removed and isolated or quarantined in a separate house or hospital for detention and treatment, and the care, provisions, and medical attendance shall be paid for by the county in which the infected person has a legal settlement, if the patient or legal guardian is unable to pay.

139A.13 RIGHTS OF ISOLATED OR QUARANTINED PERSONS.

Any person removed and isolated or quarantined in a separate house or hospital may, at the person's own expense, employ the health care provider of the person's choice, and may provide such supplies and commodities as the person may require.

139A.13A EMPLOYMENT PROTECTION.

1. An employer shall not discharge an employee, or take or fail to take action regarding an employee's promotion or proposed promotion, or take action to reduce an employee's wages or benefits for actual time worked, due to the compliance of an employee with a quarantine or isolation order or voluntary confinement request issued by the department, a local board, or the centers for disease control and prevention of the United States department of health and human services.
2. An employee whose employer violates this section may petition the court for imposition of a cease and desist order against the person's employer and for reinstatement to the person's previous position of employment. This section does not create a private cause of action for relief of money damages.

139A.14 SERVICES OR SUPPLIES -- AUTHORIZATION.

All services or supplies furnished to persons under this chapter must be authorized by the local board or an officer of the local board, and a written order designating the person employed to furnish such services or supplies, issued before the services or supplies are furnished, shall be attached to the bill when presented for audit and payment.

139A.15 FILING OF BILLS.

All bills incurred under this chapter in establishing, maintaining, and terminating isolation and quarantine, in providing a necessary house or hospital for isolation or quarantine, and in making terminal cleanings, shall be filed with the local board. The local board at its next regular meeting or special meeting called for this purpose shall examine and audit the bills and, if found correct, approve and certify the bills to the county board of supervisors for payment.

139A.16 ALLOWING CLAIMS.

All bills for supplies furnished and services rendered for persons removed and isolated or quarantined in a separate house or hospital, or for persons financially unable to provide their own sustenance and care during isolation or quarantine, shall be allowed and paid for only on a basis of the local market price for such provisions, services, and supplies in the locality furnished. A bill for the terminal cleaning of premises or effects shall not be allowed, unless the infected person or those liable for the person's support are financially unable to pay.

139A.17 APPROVAL AND PAYMENT OF CLAIMS.

The board of supervisors is not bound by the action of the local board in approving the bills, but shall pay the bills for a reasonable amount and within a reasonable time.

139A.18 REIMBURSEMENT FROM COUNTY.

If any person receives services or supplies under this chapter who does not have a legal settlement in the county in which the bills were incurred and paid, the amount paid shall be certified to the board of supervisors of the county in which the person claims settlement or owns property, and the board of supervisors of that county shall reimburse the county from which the claim is certified, in the full amount originally paid.

139A.19 CARE PROVIDER NOTIFICATION.

1. *a.* Notwithstanding any provision of this chapter to the contrary, if a care provider sustains an exposure from an individual while rendering health care services or other services, the individual to whom the care provider was exposed is deemed to consent to a test to determine if the individual has a contagious or infectious disease and is deemed to consent to notification of the care provider of the results of the test, upon submission of an exposure report by the care provider to the hospital or other person specified in this section to whom the individual is delivered by the care provider. The exposure report form may be incorporated into the Iowa prehospital care report, the Iowa prehospital advanced care report, or a similar report used by an ambulance, rescue, or first response service or law enforcement agency.

b. The hospital or other person specified in this section to whom the individual is delivered shall conduct the test. If the individual is delivered by the care provider to an institution administered by the Iowa department of corrections, the test shall be conducted by the staff physician of the institution. If the individual is delivered by the care provider to a jail, the test shall be conducted by the attending physician of the jail or the county medical examiner. The sample and test results shall only be identified by a number and shall not otherwise identify the individual tested.

c. A hospital, institutions administered by the department of corrections, and jails shall have written policies and procedures for notification of a care provider under this section. The policies and procedures shall include designation of a representative of the care provider to whom notification shall be provided and who shall, in turn, notify the care provider. The identity of the designated representative of the care provider shall not be revealed to the individual tested. The designated representative shall inform the hospital, institution administered by the department of corrections, or jail of those parties who received the notification, and following receipt of this information and upon request of the individual tested, the hospital, institution administered by the department

of corrections, or jail shall inform the individual of the parties to whom notification was provided.

d. Notwithstanding any other provision of law to the contrary, a care provider may transmit cautions regarding contagious or infectious disease information in the course of the care provider's duties over the police radio broadcasting system under chapter 693 or any other radio-based communications system if the information transmitted does not personally identify an individual.

2. If the individual tested is diagnosed or confirmed as having a contagious or infectious disease, the hospital or other person conducting the test shall notify the care provider or the designated representative of the care provider who shall then notify the care provider.

3. The notification to the care provider shall advise the care provider of possible exposure to a particular contagious or infectious disease and recommend that the care provider seek medical attention. The notification shall be provided as soon as is reasonably possible following determination that the individual has a contagious or infectious disease. The notification shall not include

> the name of the individual tested for the contagious or infectious disease unless the individual consents. If the care provider who sustained an exposure determines the identity of the individual diagnosed or confirmed as having a contagious or infectious disease, the identity of the individual shall be confidential information and shall not be disclosed by the care provider to any other person unless a specific written release is obtained from the individual diagnosed with or confirmed as having a contagious or infectious disease.

4. This section does not require or permit, unless otherwise provided, a hospital, health care provider, or other person to administer a test for the express purpose of determining the presence of a contagious or infectious disease, except that testing may be performed if the individual consents and if the requirements of this section are satisfied.

5. This section does not preclude a hospital or a health care provider from providing notification to a care provider under circumstances in which the hospital's or health care provider's policy provides for notification of the hospital's or health care provider's own employees of exposure to a contagious or infectious disease that is not life-threatening if the notice does not reveal a patient's name, unless the patient consents.

6. A hospital, health care provider, or other person participating in good faith in complying with provisions authorized or required under this section is immune from any liability, civil or criminal, which might otherwise be incurred or imposed.

7. A hospital's or health care provider's duty of notification under this section is not continuing but is limited to a diagnosis of a contagious or infectious disease made in the course of admission, care, and treatment following the rendering of health care services or other services to which notification under this section applies.

8. A hospital, health care provider, or other person who is authorized to perform a test under this section who performs the test in compliance with this section or who fails to perform the test authorized under this section, is immune from any liability, civil or criminal, which might otherwise be incurred or imposed.

9. A hospital, health care provider, or other person who is authorized to perform a test under this section has no duty to perform the test authorized.

10. The department shall adopt rules pursuant to chapter 17A to administer this section. The department may determine by rule the contagious or infectious diseases for which testing is reasonable and appropriate and which may be administered under this section.
11. The employer of a care provider who sustained an exposure under this section shall pay the costs of testing for the individual who is the source of the exposure and of the testing of the care provider, if the exposure was sustained during the course of employment. However, the department shall pay the costs of testing for the individual who is the source of the significant exposure and of the testing of the care provider who renders direct aid without compensation.

139A.20 EXPOSING TO COMMUNICABLE DISEASE.

A person who knowingly exposes another to a communicable disease or who knowingly subjects another to a child or other legally incapacitated person who has contracted a communicable disease, with the intent that another person contract the communicable disease, shall be liable for all resulting damages and shall be punished as provided in this chapter.

139A.21 REPORTABLE POISONINGS AND ILLNESSES -- EMERGENCY INFORMATION SYSTEM.

1. If the results of an examination by a public, private, or hospital clinical laboratory of a specimen from a person in Iowa yield evidence of or are reactive for a reportable poisoning or a reportable illness from a toxic agent, including methemoglobinemia, the results shall be reported to the department on forms prescribed by the department. If the laboratory is located in Iowa, the person in charge of the laboratory shall report the results. If the laboratory is not in Iowa, the health care provider submitting the specimen shall report the results.
2. The health care provider attending a person infected with a reportable poisoning or a reportable illness from a toxic agent, including methemoglobinemia, shall immediately report the case to the department. The department shall publish and distribute instructions concerning the method of reporting. Reports shall be made in accordance with rules adopted by the department.
3. A person in charge of a poison control information center shall report to the department cases of reportable poisoning, received.
4. The department shall adopt rules designating reportable poisonings, including methemoglobinemia, and illnesses which must be reported under this section.
5. The department shall establish and maintain a central registry to collect and store data reported pursuant to this section.
6. The department shall timely provide copies of all reports of pesticide poisonings or illnesses received pursuant to this section to the secretary of agriculture who shall timely forward these reports and any reports of pesticide poisonings or illnesses received pursuant to section 206.14 to the registrant of a pesticide which is the subject of any reports.
7. The department shall adopt rules specifying the requirements for the operation of an emergency information system operated by a registrant pursuant to section 206.12, subsection 3, paragraph *"c"*, which shall not exceed requirements adopted by a poison control center as defined in section 206.2. The rules shall specify the qualifications of individuals staffing an emergency information system and shall specify the maximum

amount of time that a registrant may take to provide the information to a poison control center or an attending physician treating a patient exposed to the registrant's product.

139A.22 PREVENTION OF TRANSMISSION OF HIV OR HBV TO PATIENTS.

1. A hospital shall adopt procedures requiring the establishment of protocols applicable on a case-by-case basis to a health care provider determined to be infected with HIV or HBV who ordinarily performs exposure-prone procedures as determined by an expert review panel, within the hospital setting. The protocols established shall be in accordance with the recommendations issued by the centers for disease control and prevention of the United States department of health and human services. The expert review panel may be an established committee of the hospital. The procedures may provide for referral of the health care provider to the expert review panel established by the department pursuant to subsection 3 for establishment of the protocols. The procedures shall require reporting noncompliance with the protocols by a health care provider to the licensing board with jurisdiction over the relevant health care providers.
2. A health care facility shall adopt procedures in accordance with recommendations issued by the centers for disease control and prevention of the United States department of health and human services, applicable to a health care provider determined to be infected with HIV or HBV who ordinarily performs or assists with exposure-prone procedures within the health care facility. The procedures shall require referral of the health care provider to the expert review panel established by the department pursuant to subsection 3.
3. The department shall establish an expert review panel to determine on a case-by-case basis under what circumstances, if any, a health care provider determined to be infected with HIV or HBV practicing outside the hospital setting or referred to the panel by a hospital or health care facility may perform exposure-prone procedures. If a health care provider determined to be infected with HIV or HBV does not comply with the determination of the expert review panel, the panel shall report the noncompliance to the licensing board with jurisdiction over the health care provider. A determination of an expert review panel pursuant to this section is a final agency action appealable pursuant to section 17A.19.
4. The health care provider determined to be infected with HIV or HBV, who works in a hospital setting, may elect either the expert review panel established by the hospital or the expert review panel established by the department for the purpose of making a determination of the circumstances under which the health care provider may perform exposure-prone procedures.
5. A health care provider determined to be infected with HIV or HBV shall not perform an exposure-prone procedure except as approved by the expert review panel established by the department pursuant to subsection 3, or in compliance with the protocol established by the hospital pursuant to subsection 1 or the procedures established by the health care facility pursuant to subsection 2.
6. The board of medicine, the board of physician assistants, the board of podiatry, the board of nursing, the dental board, and the board of optometry shall require that licensees comply with the recommendations issued by the centers for disease control and prevention of the United States department of health and human services for preventing transmission of human immunodeficiency virus and hepatitis B virus to patients during exposure-prone invasive procedures, with the recommendations of the expert review panel established pursuant to subsection 3, with hospital protocols

established pursuant to subsection 1, and with health care facility procedures established pursuant to subsection 2, as applicable.
7. Information relating to the HIV status of a health care provider is confidential and subject to the provisions of section 141A.9. A person who intentionally or recklessly makes an unauthorized disclosure of such information is subject to a civil penalty of one thousand dollars. The attorney general or the attorney general's designee may maintain a civil action to enforce this section. Proceedings maintained under this section shall provide for the anonymity of the health care provider and all documentation shall be maintained in a confidential manner. Information relating to the HBV status of a health care provider is confidential and shall not be accessible to the public. Information regulated by this section, however, may be disclosed to members of the expert review panel established by the department or a panel established by hospital protocol under this section. The information may also be disclosed to the appropriate licensing board by filing a report as required by this section. The licensing board shall consider the report a complaint subject to the confidentiality provisions of section 272C.6. A licensee, upon the filing of a formal charge or notice of hearing by the licensing board based on such a complaint, may seek a protective order from the board.
8. The expert review panel established by the department and individual members of the panel shall be immune from any liability, civil or criminal, for reasonable actions taken in the good faith performance of functions authorized or required by this section. A hospital, an expert review panel established by the hospital, and individual members of the panel shall be immune from any liability, civil or criminal, for reasonable actions taken in the good faith performance of functions authorized or required by this section.Complaints, investigations, reports, deliberations, and findings of the hospital and its panel with respect to a named health care provider suspected, alleged, or found to be in violation of the protocol required by this section constitute peer review records under section 147.135, and are subject to the specific confidentiality requirements and limitations of that section.

139A.23 CONTINGENT REPEAL.

If the provisions of Pub. L. No. 102-141 relating to requirements for prevention of transmission of HIV or HBV to patients in the performance of exposure-prone procedures are repealed, section 139A.22 is repealed.

139A.24 BLOOD DONATION OR SALE -- PENALTY.

A person suffering from a communicable disease dangerous to the public health who knowingly gives false information regarding the person's infected state on a blood plasma sale application to blood plasma-taking personnel commits a serious misdemeanor.

139A.25 PENALTIES.

1. Unless otherwise provided in this chapter, a person who knowingly violates any provision of this chapter, or of the rules of the department or a local board, or any lawful order, written or oral, of the department or board, or of their officers or authorized agents, is guilty of a simple misdemeanor.
2. Notwithstanding subsection 1, an individual who repeatedly fails to file any mandatory report specified in this chapter is subject to a report being made to the licensing board governing the professional activities of the individual. The department

shall notify the individual each time that the department determines that the individual has failed to file a required report. The department shall inform the individual in the notification that the individual may provide information to the department to explain or dispute the failure to report.
3. Notwithstanding subsection 1, a public, private, or hospital clinical laboratory that repeatedly fails to file a mandatory report specified in this chapter is subject to a civil penalty of not more than one thousand dollars per occurrence. The department shall not impose the penalty under this subsection without prior written notice and opportunity for hearing.

139A.26 MENINGOCOCCAL DISEASE VACCINATION INFORMATION FOR POSTSECONDARY STUDENTS.

1. Each institution of higher education that has an on-campus residence hall or dormitory shall provide vaccination information on meningococcal disease to each student enrolled in the institution. The vaccination information shall be contained on student health forms provided to each student by the institution, which forms shall include space for the student to indicate whether or not the student has received the vaccination against meningococcal disease. The vaccination information about meningococcal disease shall include any recommendations issued by the national centers for disease control and prevention regarding the disease. Vaccination information obtained under this section that is in the possession of an institution of higher education pursuant to this section shall not be considered a public record. Data obtained under this section shall be submitted annually to the department in a manner prescribed by the department and such that no individual person can be identified.
2. This section shall not be construed to require any institution of higher education to provide the vaccination against meningococcal disease to students.
3. This section shall not apply if the national centers for disease control and prevention no longer recommend the meningococcal disease vaccine.
4. This section does not create a private right of action.
5. The department shall adopt rules for administration of this section. The department shall review the requirements of this section at least every five years, and shall submit its recommendations for modification to, or continuation of, this section based upon new information about the disease or vaccination against the disease in a report that shall be submitted to the general assembly no later than January 15, 2010, with subsequent reports developed and submitted by January 15 at least every fifth year thereafter.

139A.27 THROUGH 139A.29 Reserved.

139A.30 CONFIDENTIAL REPORTS.

Reports to the department which include the identity of persons infected with a sexually transmitted disease or infection, and all such related information, records, and reports concerning the person, shall be confidential and shall not be accessible to the public. However, such reports, information, and records shall be confidential only to the extent necessary to prevent identification of persons named in such reports, information, and records; the other parts of such reports, information, and records shall be public records. The preceding sentence shall prevail over any inconsistent provision of this subchapter.

139A.31 REPORT TO DEPARTMENT.

Immediately after the first examination or treatment of any person infected with any sexually transmitted disease or infection, the health care provider who performed the examination or treatment shall transmit to the department a report stating the name of the infected person, the address of the infected person, the infected person's date of birth, the sex of the infected person, the race and ethnicity of the infected person, the infected person's marital status, the infected person's telephone number, if the infected person is female, whether the infected person is pregnant, the name and address of the laboratory that performed the test, the date the test was found to be positive and the collection date, and the name of the health care provider who performed the test. However, when a case occurs within the jurisdiction of a local health department, the report shall be made directly to the local health department which shall immediately forward the information to the department. Reports shall be made in accordance with rules adopted by the department. Reports shall be confidential. Any person filing a report of a sexually transmitted disease or infection who is acting reasonably and in good faith is immune from any liability, civil or criminal, which might otherwise be incurred or imposed as a result of such report.

139A.32 EXAMINATION RESULTS FROM LABORATORY -- REPORT.

A person in charge of a public, private, or hospital clinical laboratory shall report to the department, on forms prescribed by the department, results obtained in the examination of all specimens which yield evidence of or are reactive for those diseases defined as sexually transmitted diseases or infections, and listed in the Iowa administrative code. The report shall state the name of the infected person from whom the specimen was obtained, the address of the infected person, the infected person's date of birth, the sex of the infected person, the race and ethnicity of the infected person, the infected person's marital status, the infected person's telephone number, if the infected person is female, whether the infected person is pregnant, the name and address of the laboratory that performed the test, the laboratory results, the test employed, the date the test was found to be positive and the collection date, the name of the health care provider who performed the test, and the name and address of the person submitting the specimen.

139A.33 DETERMINATION OF SOURCE.

The local board or the department shall use every available means to determine the source and spread of any infectious case of sexually transmitted disease or infection which is reported.

139A.34 EXAMINATION OF PERSONS SUSPECTED.

The local board shall cause an examination to be made of every person reasonably suspected, on the basis of epidemiological investigation, of having any sexually transmitted disease or infection in the infectious stages to ascertain if such person is infected and, if infected, to cause such person to be treated. A person who is under the care and treatment of a health care provider for the suspected condition shall not be subjected to such examination. If a person suspected of having a sexually transmitted disease or infection refuses to submit to an examination voluntarily, application may be made by the local board to the district court for an order compelling the person to submit to examination and, if infected, to treatment. The person shall be treated until

certified as no longer infectious to the local board or to the department. If treatment is ordered by the district court, the attending health care provider shall certify that the person is no longer infectious.

139A.35 MINORS.

A minor shall have the legal capacity to act and give consent to provision of medical care or services to the minor for the prevention, diagnosis, or treatment of a sexually transmitted disease or infection by a hospital, clinic, or health care provider. Such medical care or services shall be provided by or under the supervision of a physician licensed to practice medicine and surgery or osteopathic medicine and surgery, a physician assistant, or an advanced registered nurse practitioner. Consent shall not be subject to later disaffirmance by reason of such minority. The consent of another person, including but not limited to the consent of a spouse, parent, custodian, or guardian, shall not be necessary.

139A.36 CERTIFICATE NOT TO BE ISSUED.

A certificate of freedom from sexually transmitted disease or infection shall not be issued to any person by any official health agency.

139A.37 PREGNANT WOMEN.

The department shall adopt rules which incorporate the prenatal guidelines established by the centers for disease control and prevention of the United States department of health and human services as the state guidelines for prenatal testing and care relative to infectious disease.

139A.38 MEDICAL TREATMENT OF NEWLY BORN.

A physician attending the birth of a child shall cause to be instilled into the eyes of the newly born infant a prophylactic solution approved by the department. This section shall not be construed to require treatment of the infant's eyes with a prophylactic solution if the infant's parent or legal guardian states that such treatment conflicts with the tenets and practices of a recognized religious denomination of which the parent or legal guardian is an adherent or member.

139A.39 RELIGIOUS EXCEPTIONS.

A provision of this chapter shall not be construed to require or compel any person to take or follow a course of medical treatment prescribed by law or a health care provider if the person is an adherent or member of a church or religious denomination and in accordance with the tenets or principles of the person's church or religious denomination the person opposes the specific course of medical treatment. However, such person while in an infectious stage of disease shall be subject to isolation and such other measures appropriate for the prevention of the spread of the disease to other persons.

139A.40 FILING FALSE REPORTS.

A person who knowingly makes a false statement in any of the reports required by this subchapter concerning persons infected with any sexually transmitted disease or infection, or who discloses the identity of such person, except as authorized by this subchapter, shall be punished as provided in section 139A.25.

139A.41 CHLAMYDIA AND GONORRHEA TREATMENT.

Notwithstanding any other provision of law to the contrary, a physician, physician assistant, or advanced registered nurse practitioner who diagnoses a sexually transmitted chlamydia or gonorrhea infection in an individual patient may prescribe, dispense, furnish, or otherwise provide prescription oral antibiotic drugs to that patient's sexual partner or partners without examination of that patient's partner or partners. If the infected individual patient is unwilling or unable to deliver such prescription drugs to a sexual partner or partners, a physician, physician assistant, or advanced registered nurse practitioner may dispense, furnish, or otherwise provide the prescription drugs to the department or local disease prevention investigation staff for delivery to the partner or partners.

CHAPTER 141A ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS)

141A.1 DEFINITIONS.

As used in this chapter, unless the context otherwise requires:

1. *"AIDS"* means acquired immune deficiency syndrome as defined by the centers for disease control and prevention of the United States department of health and human services.
2. *"AIDS-related conditions"* means any condition resulting from the human immunodeficiency virus infection that meets the definition of AIDS as established by the centers for disease control and prevention of the United States department of health and human services.
3. *"Blinded epidemiological studies"* means studies in which specimens which were collected for other purposes are selected according to established criteria, are permanently stripped of personal identifiers, and are then tested.
4. *"Blood bank"* means a facility for the collection, processing, or storage of human blood or blood derivatives, including blood plasma, or from which or by means of which human blood or blood derivatives are distributed or otherwise made available.
5. *"Care provider"* means an individual who is trained and authorized by federal or state law to provide health care services or services of any kind in the course of the individual's official duties, for compensation or in a voluntary capacity, who is a health care provider, emergency medical care provider as defined in section 147A.1, fire fighter, or peace officer. *"Care provider"* also means an individual who renders emergency care or assistance in an emergency or due to an accident as described in section 613.17.
6. *"Department"* means the Iowa department of public health.
7. *"Good faith"* means objectively reasonable and not in violation of clearly established statutory rights or other rights of a person which a reasonable person would know or should have known.
8. *"Health care provider"* means a person licensed to practice medicine and surgery, osteopathic medicine and surgery, chiropractic, podiatry, nursing, dentistry, or optometry, or as a physician assistant, dental hygienist, or acupuncturist.
9. *"Health facility"* means a hospital, health care facility, clinic, blood bank, blood center, sperm bank, laboratory organ transplant center and procurement agency, or other health care institution.

10. *"HIV"* means the human immunodeficiency virus identified as the causative agent of AIDS.
11. *"HIV-related condition"* means any condition resulting from the human immunodeficiency virus infection.
12. *"HIV-related test"* means a diagnostic test conducted by a laboratory approved pursuant to the federal Clinical Laboratory Improvement Amendments for determining the presence of HIV or antibodies to HIV.
13. *"Infectious bodily fluids"* means bodily fluids capable of transmitting HIV infection as determined by the centers for disease control and prevention of the United States department of health and human services and adopted by rule of the department.
14. *"Legal guardian"* means a person appointed by a court pursuant to chapter 633 or an attorney in fact as defined in section 144B.1. In the case of a minor, *"legal guardian"* also means a parent or other person responsible for the care of the minor.
15. *"Nonblinded epidemiological studies"* means studies in which specimens are collected for the express purpose of testing for the HIV infection and persons included in the nonblinded study are selected according to established criteria.
16. *"Release of test results"* means a written authorization for disclosure of HIV-related test results which is signed and dated, and which specifies to whom disclosure is authorized and the time period during which the release is to be effective.
17. *"Sample"* means a human specimen obtained for the purpose of conducting an HIV-related test.
18. *"Significant exposure"* means the risk of contracting HIV infection by means of exposure to a person's infectious bodily fluids in a manner capable of transmitting HIV infection as determined by the centers for disease control and prevention of the United States department of health and human services and adopted by rule of the department.

141A.2 LEAD AGENCY.

1. The department is designated as the lead agency in the coordination and implementation of the Iowa comprehensive HIV plan.
2. The department shall adopt rules pursuant to chapter 17A to implement and enforce this chapter. The rules may include procedures for taking appropriate action with regard to health facilities or health care providers which violate this chapter or the rules adopted pursuant to this chapter.
3. The department shall adopt rules pursuant to chapter 17A which require that if a health care provider attending a person prior to the person's death determines that the person suffered from or was suspected of suffering from a contagious or infectious disease, the health care provider shall place with the remains written notification of the condition for the information of any person handling the body of the deceased person subsequent to the person's death. For purposes of this subsection, *"contagious or infectious disease"* means hepatitis in any form, meningococcal disease, tuberculosis, and any other disease including AIDS or HIV infection, determined to be life-threatening to a person exposed to the disease as established by rules adopted by the department based upon a determination by the state epidemiologist and in accordance with guidelines of the centers for disease control and prevention of the United States department of health and human services.
4. The department shall provide consultation services to all care providers, including paramedics, ambulance personnel, physicians, nurses, hospital personnel, first

responders, peace officers, and fire fighters, who provide care services to a person, and to all persons who attend dead bodies regarding standard precautions to prevent the transmission of contagious and infectious diseases.
5. The department shall coordinate efforts with local health officers to investigate sources of HIV infection and use every appropriate means to prevent the spread of the infection.
6. The department, with the approval of the state board of health, may conduct epidemiological blinded and nonblinded studies to determine the incidence and prevalence of HIV infection. Initiation of any new epidemiological studies shall be contingent upon the receipt of funding sufficient to cover all the costs associated with the studies. The informed consent, reporting, and counseling requirements of this chapter shall not apply to blinded studies.

141A.3 DUTIES OF THE DEPARTMENT.

1. All federal and state moneys appropriated to the department for HIV-related activities shall be utilized and distributed in a manner consistent with the guidelines established by the United States department of health and human services.
2. The department shall do all of the following:
a. Provide consultation services to agencies and organizations regarding appropriate policies for testing, education, confidentiality, and infection control.
b. Provide health information to the public regarding HIV infection, including information about how the infection is transmitted and how transmittal can be prevented. The department shall prepare and distribute information regarding HIV infection and prevention.
c. Provide consultation services concerning HIV infection in the workplace.
d. Implement HIV education risk-reduction programs for specific populations at high risk for infection.
e. Provide an informational brochure for patients who provide samples for purposes of performing an HIV test which, at a minimum, shall include a summary of the patient's rights and responsibilities under the law.
f. In cooperation with the department of education, recommend evidence-based, medically accurate HIV prevention curricula for use at the discretion of secondary and middle schools.

141A.4 TESTING AND EDUCATION.

1. HIV testing and education shall be offered to persons who are at risk for HIV infection including all of the following:
a. All persons testing positive for a sexually transmitted disease.
b. All persons having a history of injecting drug abuse.
c. Male and female sex workers and those who trade sex for drugs, money, or favors.
d. Sexual partners of HIV-infected persons.
e. Persons whose sexual partners are identified in paragraphs *"a"* through *"d"*.
2. *a.* All pregnant women shall be tested for HIV infection as part of the routine panel of prenatal tests.
b. A pregnant woman shall be notified that HIV screening is recommended for all prenatal patients and that the pregnant woman will receive an HIV test as part of the routine panel of prenatal tests unless the pregnant woman objects to the test.

c. If a pregnant woman objects to and declines the test, the decision shall be documented in the pregnant woman's medical record.
d. Information about HIV prevention, risk reduction, and treatment opportunities to reduce the possible transmission of HIV to a fetus shall be made available to all pregnant women.

141A.5 PARTNER NOTIFICATION PROGRAM -- HIV.

1. The department shall maintain a partner notification program for persons known to have tested positive for HIV infection.
2. In administering the program, the department shall provide for the following:
a. A person who tests positive for HIV infection shall receive post-test counseling, during which time the person shall be encouraged to refer for counseling and HIV testing any person with whom the person has had sexual relations or has shared drug injecting equipment.
b. The physician or other health care provider attending the person may provide to the department any relevant information provided by the person regarding any person with whom the tested person has had sexual relations or has shared drug injecting equipment.
c. (1) Devise a procedure, as a part of the partner notification program, to provide for the notification of an identifiable third party who is a sexual partner of or who shares drug injecting equipment with a person who has tested positive for HIV, by the department or a physician, when all of the following situations exist:
(a) A physician for the infected person is of the good faith opinion that the nature of the continuing contact poses an imminent danger of HIV infection transmission to the third party.
(b) When the physician believes in good faith that the infected person, despite strong encouragement, has not and will not warn the third party and will not participate in the voluntary partner notification program.
(2) Notwithstanding subsection 3, the department or a physician may reveal the identity of a person who has tested positive for HIV infection pursuant to this subsection only to the extent necessary to protect a third party from the direct threat of transmission. This subsection shall not be interpreted to create a duty to warn third parties of the danger of exposure to HIV through contact with a person who tests positive for HIV infection.
(3) The department shall adopt rules pursuant to chapter 17A to implement this paragraph *"c"*. The rules shall provide a detailed procedure by which the department or a physician may directly notify an endangered third party.
3. In making contact the department shall not disclose the identity of the person who provided the names of the persons to be contacted and shall protect the confidentiality of persons contacted.
4. The department may delegate its partner notification duties under this section to local health authorities unless the local authority refuses or neglects to conduct the partner notification program in a manner deemed to be effective by the department.
5. In addition to the provisions for partner notification provided under this section and notwithstanding any provision to the contrary, a county medical examiner or deputy medical examiner performing official duties pursuant to sections 331.801 through 331.805 or the state medical examiner or deputy medical examiner performing official duties pursuant to chapter 691, who determines through an investigation that a deceased person was infected with HIV, may notify directly, or request that the

department notify, the immediate family of the deceased or any person known to have had a significant exposure from the deceased of the finding.

141A.6 HIV-RELATED CONDITIONS -- CONSENT, TESTING, AND REPORTING -- PENALTY.

1. Prior to undergoing an HIV-related test, information shall be available to the subject of the test concerning testing and any means of obtaining additional information regarding HIV infection and risk reduction. If an individual signs a general consent form for the performance of medical tests or procedures, the signing of an additional consent form for the specific purpose of consenting to an HIV-related test is not required during the time in which the general consent form is in effect. If an individual has not signed a general consent form for the performance of medical tests and procedures or the consent form is no longer in effect, a health care provider shall obtain oral or written consent prior to performing an HIV-related test. If an individual is unable to provide consent, the individual's legal guardian may provide consent. If the individual's legal guardian cannot be located or is unavailable, a health care provider may authorize the test when the test results are necessary for diagnostic purposes to provide appropriate urgent medical care.

2. Within seven days of the receipt of a test result indicating HIV infection which has been confirmed as positive according to prevailing medical technology or immediately after the initial examination or treatment of an individual infected with HIV, the physician or other health care provider at whose request the test was performed or who performed the initial examination or treatment shall make a report to the department on a form provided by the department.

3. Within seven days of diagnosing a person as having AIDS or an AIDS-related condition, the diagnosing physician shall make a report to the department on a form provided by the department.

4. Within seven days of the death of a person with HIV infection, the attending physician shall make a report to the department on a form provided by the department.

5. Within seven days of the receipt of a test result indicating HIV infection which has been confirmed as positive according to prevailing medical technology, the director of a blood bank shall make a report to the department on a form provided by the department.

6. Within seven days of the receipt of a test result that is indicative of HIV, the director of a clinical laboratory shall make a report to the department on a form provided by the department.

7. The forms provided by the department shall require inclusion of all of the following information:

a. The name of the patient.

b. The address of the patient.

c. The patient's date of birth.

d. The gender of the patient.

e. The race and ethnicity of the patient.

f. The patient's marital status.

g. The patient's telephone number.

h. If an HIV-related test was performed, the name and address of the laboratory or blood bank.

i. If an HIV-related test was performed, the date the test was found to be positive and the collection date.

j. If an HIV-related test was performed, the name of the physician or health care provider who performed the test.

k. If the patient is female, whether the patient is pregnant.

8. An individual who repeatedly fails to file the report required under this section is subject to a report being made to the licensing board governing the professional activities of the individual. The department shall notify the individual each time the department determines that the individual has failed to file a required report. The department shall inform the individual in the notification that the individual may provide information to the department to explain or dispute the failure to report.

9. A public, private, or hospital clinical laboratory that repeatedly fails to make the report required under this section is subject to a civil penalty of not more than one thousand dollars per occurrence. The department shall not impose the penalty under this subsection without prior written notice and opportunity for hearing.

141A.7 TEST RESULTS -- COUNSELING -- APPLICATION FOR SERVICES.

1. At any time that the subject of an HIV-related test is informed of confirmed positive test results, counseling concerning the emotional and physical health effects shall be initiated. Particular attention shall be given to explaining the need for the precautions necessary to avoid transmitting the virus. The subject shall be given information concerning additional counseling. If the legal guardian of the subject of the test provides consent to the test pursuant to section 141A.6, the provisions of this subsection shall apply to the legal guardian.

2. Notwithstanding subsection 1, the provisions of this section do not apply to any of the following:

a. The performance by a health care provider or health facility of an HIV-related test when the health care provider or health facility procures, processes, distributes, or uses a human body part donated for a purpose specified under the revised uniform anatomical gift Act as provided in chapter 142C, or semen provided prior to July 1, 1988, for the purpose of artificial insemination, or donations of blood, and such test is necessary to ensure medical acceptability of such gift or semen for the purposes intended.

b. A person engaged in the business of insurance who is subject to section 505.16.

c. The performance by a health care provider or health facility of an HIV-related test when the subject of the test is deceased and a documented significant exposure has occurred.

d. The performance by a health care provider or health facility of an HIV-related test when the subject of the test is unable to provide consent and the health care provider or health care facility provides consent for the patient pursuant to section 141A.6.

3. A person may apply for voluntary treatment, contraceptive services, or screening or treatment for HIV infection and other sexually transmitted diseases directly to a licensed physician and surgeon, an osteopathic physician and surgeon, or a family planning clinic. Notwithstanding any other provision of law, however, a minor shall be informed prior to testing that, upon confirmation according to prevailing medical technology of a positive HIV-related test result, the minor's legal guardian is required to be informed by the testing facility. Testing facilities where minors are tested shall have available a program to assist minors and legal guardians with the notification process which emphasizes the

need for family support and assists in making available the resources necessary to accomplish that goal. However, a testing facility which is precluded by federal statute, regulation, or centers for disease control and prevention guidelines from informing the legal guardian is exempt from the notification requirement. The minor shall give written consent to these procedures and to receive the services, screening, or treatment. Such consent is not subject to later disaffirmance by reason of minority.

141A.8 CARE PROVIDER NOTIFICATION.

1. *a.* Notwithstanding any provision of this chapter to the contrary, if a care provider sustains a significant exposure from an individual, the individual to whom the care provider was exposed is deemed to consent to a test to determine the presence of HIV infection in that individual and is deemed to consent to notification of the care provider of the HIV test results of the individual, upon submission of a significant exposure report by the care provider as provided by rule.

b. The hospital or clinic in which the exposure occurred or any other person specified in this section to whom the individual is delivered shall conduct the test. If the individual is delivered by the care provider to an institution administered by the Iowa department of corrections, the test shall be conducted by the staff physician of the institution. If the individual is delivered by the care provider to a jail, the test shall be conducted by the attending physician of the jail or the county medical examiner. The sample and test results shall only be identified by a number.

c. A hospital, institutions administered by the department of corrections, and jails shall have written policies and procedures for notification of a care provider under this section. The policies and procedures shall include designation of a representative of the care provider to whom notification shall be provided and who shall, in turn, notify the care provider. The identity of the designated representative of the care provider shall not be revealed to the individual tested. The designated representative shall inform the hospital, institution administered by the department of corrections, or jail of those parties who received the notification, and following receipt of this information and upon request of the individual tested, the hospital, institution administered by the department of corrections, or jail shall inform the individual of the parties to whom notification was provided.

2. *a.* If the test results are positive, the hospital or other person performing the test shall notify the subject of the test and ensure the performance of counseling and reporting requirements of this chapter in the same manner as for an individual from whom actual consent was obtained. The report to the department required pursuant to section 141A.6 shall include the name of the individual tested.

b. If the HIV test results of the subject of the test are positive, the hospital or other person performing the test shall notify the care provider or the designated representative of the care provider who shall then notify the care provider who sustained the exposure.

c. The notification shall be provided as soon as is reasonably possible following determination that the HIV test results of the subject of the test are positive. The notification shall not include the name of the individual tested for HIV infection unless the individual provides a specific written release. If the care provider who sustained the significant exposure determines the identity of the individual tested, the identity of the individual shall be confidential information and shall not be disclosed by the care

provider to any other person unless a specific written release is obtained from the individual tested.
3. This section does not preclude a hospital or health care provider from providing notification to a care provider under circumstances in which the hospital's or health care provider's policy provides for notification of the hospital's or health care provider's own employees of exposure to HIV infection if the notice does not reveal a patient's name, unless the patient consents.
4. A hospital, health care provider, or other person participating in good faith in making a report under the notification provisions of this section, under procedures similar to this section for notification of its own employees upon filing of a significant exposure report, or in failing to make a report under this section, is immune from any liability, civil or criminal, which might otherwise be incurred or imposed.
5. A hospital's or health care provider's duty to notify under this section is not continuing but is limited to the diagnosis of HIV infection made in the course of admission, care, and treatment following the rendering of health care services or other services to the individual with the infection to which notification under this section applies.
6. Notwithstanding subsection 5, if, following discharge from or completion of care or treatment by a hospital, an individual for whom a significant exposure report was submitted but which report did not result in notification, wishes to provide information regarding the individual's HIV infection status to the care provider who submitted the report, the hospital shall provide a procedure for notifying the care provider.
7. A hospital, health care provider, or other person who is authorized to perform an HIV test under this section, who performs the HIV test in compliance with this section or who fails to perform an HIV test authorized under this section, is immune from any liability, civil or criminal, which might otherwise be incurred or imposed.
8. A hospital, health care provider, or other person who is authorized to perform a test under this section has no duty to perform the HIV test authorized.
9. The employer of a care provider who sustained a significant exposure under this section shall pay the costs of HIV testing for the individual who is the source of the significant exposure and of the testing and counseling of the care provider, if the significant exposure was sustained during the course of employment. However, the department shall assist an individual who is the source of the significant exposure in finding resources to pay for the cost of the HIV test, and shall assist a care provider who renders direct aid without compensation in finding resources to pay for the cost of the testing and counseling.

141A.9 CONFIDENTIALITY OF INFORMATION.

1. Any information, including reports and records, obtained, submitted, and maintained pursuant to this chapter is strictly confidential medical information. The information shall not be released, shared with an agency or institution, or made public upon subpoena, search warrant, discovery proceedings, or by any other means except as provided in this chapter. A person shall not be compelled to disclose the identity of any person upon whom an HIV-related test is performed, or the results of the test in a manner which permits identification of the subject of the test, except to persons entitled to that information under this chapter.
2. HIV-related test results shall be made available for release to the following individuals or under the following circumstances:

a. To the subject of the test or the subject's legal guardian subject to the provisions of section 141A.7, subsection 3, when applicable.
b. To any person who secures a written release of test results executed by the subject of the test or the subject's legal guardian.
c. To an authorized agent or employee of a health facility or health care provider, if the health facility or health care provider ordered or participated in the testing or is otherwise authorized to obtain the test results, the agent or employee provides patient care or handles or processes samples, and the agent or employee has a medical need to know such information.
d. To a health care provider providing care to the subject of the test when knowledge of the test results is necessary to provide care or treatment.
e. To the department in accordance with reporting requirements for an HIV-related condition.
f. To a health facility or health care provider which procures, processes, distributes, or uses a human body part from a deceased person with respect to medical information regarding that person, or semen provided prior to July 1, 1988, for the purpose of artificial insemination.
g. To a person allowed access to an HIV-related test result by a court order which is issued in compliance with the following provisions:
(1) A court has found that the person seeking the test results has demonstrated a compelling need for the test results which need cannot be accommodated by other means. In assessing compelling need, the court shall weigh the need for disclosure against the privacy interest of the test subject and the public interest which may be disserved by disclosure due to its deterrent effect on future testing or due to its effect in leading to discrimination.
(2) Pleadings pertaining to disclosure of test results shall substitute a pseudonym for the true name of the subject of the test. The disclosure to the parties of the subject's true name shall be communicated confidentially in documents not filed with the court.
(3) Before granting an order, the court shall provide the person whose test results are in question with notice and a reasonable opportunity to participate in the proceedings if the person is not already a party.
(4) Court proceedings as to disclosure of test results shall be conducted in camera unless the subject of the test agrees to a hearing in open court or unless the court determines that a public hearing is necessary to the public interest and the proper administration of justice.
(5) Upon the issuance of an order to disclose test results, the court shall impose appropriate safeguards against unauthorized disclosure, which shall specify the persons who may gain access to the information, the purposes for which the information shall be used, and appropriate prohibitions on future disclosure.
h. To an employer, if the test is authorized to be required under any other provision of law.
i. Pursuant to section 915.43, to a convicted or alleged sexual assault offender; the physician or other health care provider who orders the test of a convicted or alleged offender; the victim; the parent, guardian, or custodian of the victim if the victim is a minor; the physician of the victim if requested by the victim; the victim counselor or person requested by the victim to provide counseling regarding the HIV-related test and results; the victim's spouse; persons with whom the victim has engaged in vaginal, anal, or oral intercourse subsequent to the sexual assault; members of the victim's family

within the third degree of consanguinity; and the county attorney who may use the results as evidence in the prosecution of sexual assault under chapter 915, subchapter IV, or prosecution of the offense of criminal transmission of HIV under chapter 709C. For the purposes of this paragraph, *"victim"* means victim as defined in section 915.40.
j. To employees of state correctional institutions subject to the jurisdiction of the department of corrections, employees of secure facilities for juveniles subject to the department of human services, and employees of city and county jails, if the employees have direct supervision over inmates of those facilities or institutions in the exercise of the duties prescribed pursuant to section 80.9B.
3. Release may be made of medical or epidemiological information for statistical purposes in a manner such that no individual person can be identified.
4. Release may be made of medical or epidemiological information to the extent necessary to enforce the provisions of this chapter and related rules concerning the treatment, control, and investigation of HIV infection by public health officials.
5. Release may be made of medical or epidemiological information to medical personnel to the extent necessary to protect the health or life of the named party.
6. Release may be made of test results concerning a patient pursuant to procedures established under section 141A.5, subsection 2, paragraph *"c"*.
7. Medical information secured pursuant to subsection 1 may be shared between employees of the department who shall use the information collected only for the purposes of carrying out their official duties in preventing the spread of the disease or the spread of other reportable diseases as defined in section 139A.2.

141A.10 IMMUNITIES.

1. A person making a report in good faith pursuant to this chapter is immune from any liability, civil or criminal, which might otherwise be incurred or imposed as a result of the report.
2. A health care provider attending a person who tests positive for the HIV infection has no duty to disclose to or to warn third parties of the dangers of exposure to HIV infection through contact with that person and is immune from any liability, civil or criminal, for failure to disclose to or warn third parties of the condition of that person.

141A.11 REMEDIES.

1. A person aggrieved by a violation of this chapter shall have a right of civil action for damages in district court.
2. A care provider who intentionally or recklessly makes an unauthorized disclosure under this chapter is subject to a civil penalty of one thousand dollars.
3. A person who violates a confidentiality requirement of section 141A.5 is guilty of an aggravated misdemeanor.
4. A civil action under this chapter is barred unless the action is commenced within two years after the cause of action accrues.
5. The attorney general may maintain a civil action to enforce this chapter.
6. This chapter does not limit the rights of the subject of an HIV-related test to recover damages or other relief under any other applicable law.
7. This chapter shall not be construed to impose civil liability or criminal sanctions for disclosure of HIV-related test results in accordance with any reporting requirement for a diagnosed case of AIDS or a related condition by the department or the centers for

disease control and prevention of the United States department of health and human services.

CHAPTER 1
REPORTABLE DISEASES, POISONINGS AND CONDITIONS, AND QUARANTINE AND ISOLATION

641—1.1(139A) Definitions. For the purpose of these rules, the following definitions shall apply:

"Acute or chronic respiratory conditions due to fumes, vapors or dusts" means acute chemical bronchitis; any acute, subacute, or chronic respiratory condition due to inhalation of a chemical fume or vapor; or pneumoconioses not specifically listed elsewhere in these rules. (ICD-10 codes J63.0 to J64, J66, and J68.0 to J68.9) "Acute or chronic respiratory conditions due to fumes, vapors or dusts" excludes those respiratory conditions related to tobacco smoke exposure.

"Agriculturally related injury" means any nonhousehold injury to a farmer, farm worker, farm family member, or other individual, which occurred on a farm, or in the course of handling, producing, processing, transporting or warehousing farm commodities.

"AIDS" means AIDS as defined in Iowa Code section 141A.1.

"Area quarantine" means prohibiting ingress to and egress from a building or buildings, structure or structures, or other definable physical location, or portion thereof, to prevent or contain the spread of a suspected or confirmed quarantinable disease or to prevent or contain exposure to a suspected or known chemical, biological, radioactive, or other hazardous or toxic agent.

"Business" means and includes every trade, occupation, or profession.

"Care provider" means an individual who is trained and authorized by federal or state law to provide health care services or services of any kind in the course of the individual's official duties, for compensation or in a voluntary capacity, who is a health care provider, emergency medical care provider as defined in Iowa Code section 147A.1, firefighter, or peace officer. "Care provider" also means an individual who renders emergency care or assistance in an emergency or due to an accident as described in Iowa Code section 613.17.

"Case" means an individual who has confirmatory evidence of disease.

"Clinical laboratory" means any laboratory performing analyses on specimens taken from the body of a person in order to assess that person's health status.

"Communicable disease" means any disease spread from person to person or animal to person.

"Congenital or inherited disorder" means congenital or inherited disorder as defined in Iowa Code section 136A.2.

"Contagious or infectious disease" means hepatitis in any form, meningococcal disease, tuberculosis, and any other disease, with the exception of AIDS or HIV infection as defined in Iowa Code section 141A.1, determined to be life-threatening to a person exposed to the disease based upon a determination by the state public health medical director and epidemiologist and in accordance with guidelines of the Centers for Disease Control and Prevention of the United States Department of Health and Human Services.

"Department" means the Iowa department of public health.

"Designated officer" means a person who is designated by a department, agency, division, or service organization to act as an infection control liaison officer.

"Director" means the director of the Iowa department of public health.

"Exposure" means the risk of contracting disease.

"Fetal death" means an unintended death occurring after a gestation period of 20 completed weeks, or an unintended death of a fetus with a weight of 350 or more grams. "Fetal death" is synonymous with stillbirth.

"HBV" means hepatitis B virus.

"Health care facility" means a health care facility as defined in Iowa Code section 135C.1, an ambulatory surgical center, or a clinic.

"Health care provider" means a person licensed to practice medicine and surgery, osteopathic medicine and surgery, osteopathy, chiropractic, podiatry, nursing, dentistry, optometry, or licensed as a physician assistant, dental hygienist, or acupuncturist.

"HIV" means HIV as defined in Iowa Code section 141A.1.

"Hospital" means hospital as defined in Iowa Code section 135B.1.

"Hypersensitivity pneumonitis" means a disease in which the air sacs (alveoli) of the lungs become inflamed when certain dusts are inhaled to which the person is sensitized or allergic. "Hypersensitivity pneumonitis" includes but is not limited to farmer's lung, silo filler's disease, and toxic organic dust syndrome.

"IDSS" means the Iowa disease surveillance system, a secure Web-based statewide disease reporting and surveillance system.

"Infectious disease" means a disease caused by the entrance into the body of organisms, including but not limited to bacteria, protozoans, fungi, prions, or viruses which grow and multiply.

"Infectious tuberculosis" means pulmonary or laryngeal tuberculosis as evidenced by:

1. Isolation of M. tuberculosis complex (positive culture) from a clinical specimen or positive nucleic acid amplification test, or

2. Both radiographic evidence of tuberculosis, such as an abnormal chest X-ray, and clinical evidence, such as a positive skin test or whole blood assay test for tuberculosis infection, coughing, sputum production, fever, or other symptoms compatible with infectious tuberculosis that lead a physician to diagnose infectious tuberculosis according to currently acceptable standards of medical practice and to initiate treatment for tuberculosis.

"Injury" means physical damage or harm to the body as the result of an act or event.

"Investigation" means an inquiry conducted to determine the specific source, mode of transmission, and cause of a disease or suspected disease occurrence and to determine the specific incidence, prevalence, and extent of the disease in the affected population. "Investigation" may also include the application of scientific methods and analysis to institute appropriate control measures.

"Isolation" means the separation of persons or animals presumably or actually infected with a communicable disease, or that are disease carriers, for the usual period of communicability of that disease. Isolation shall be in such places, marked by placards if necessary, and under such conditions to prevent the direct or indirect conveyance of the infectious agent or contagion to susceptible persons.

"Local board" means the local board of health.

"Local department" means the local health department.

"Noncommunicable respiratory illnesses" means an illness indicating prolonged exposure or overexposure to asbestos, silica, silicates, aluminum, graphite, bauxite, beryllium, cotton dust or other textile material, or coal dust. "Noncommunicable respiratory illnesses" includes, but is not limited to asbestosis, coal worker's pneumoconiosis, and silicosis.

"Occupationally related asthma, bronchitis or respiratory hypersensitivity reaction" means any extrinsic asthma or acute chemical pneumonitis due to exposure to toxic agents in the workplace. (ICD-10 codes J67.0 to J67.9)

"Pesticide" means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating directly or indirectly any insects, rodents, nematodes, fungi, weeds, and other forms of plant or animal life or viruses, except viruses on or in living persons, which the Iowa secretary of agriculture shall declare to be a pest; and (2) any substances intended for use as a plant growth regulator, defoliant, or desiccant. Pesticides include active and inert ingredients of herbicides, insecticides, rodenticides, repellants, fumigants, fungicides, wood treatment products, and disinfectants as well as adjuvants that are added to a pesticide formulation to improve or change properties such as deposition, persistence, or mixing ability.

"Pesticide poisoning" means any acute or subacute systemic, ophthalmologic, or dermatologic illness or injury resulting from or suspected of resulting from inhalation or ingestion of, dermal exposure to, or ocular contact with a pesticide. Laboratory confirmation is not required.

"Placard" means a warning sign to be erected and displayed on the periphery of a quarantine area, forbidding entry to or exit from the area.

"Poison control or poison information center" means any organization or program which has as one of its primary objectives the provision of toxicologic and pharmacologic information and referral services to the public and to health care providers (other than pharmacists) in response to inquiries about actual or potential poisonings.

"Public health disaster" means an incident as defined in Iowa Code section 135.140.

"Quarantinable disease" means any communicable disease which presents a risk of serious harm to public health and which may require isolation or quarantine to prevent its spread. "Quarantinable disease" includes but is not limited to cholera; diphtheria; infectious tuberculosis; plague; smallpox; yellow fever; viral hemorrhagic fevers, including Lassa, Marburg, Ebola, Crimean-Congo, South American, and others not yet isolated or named; novel influenza; and severe acute respiratory syndrome (SARS).

"Quarantine" means the limitation of freedom of movement of persons or animals that have been exposed to a quarantinable disease within specified limits marked by placards for a period of time equal to the longest usual incubation period of the disease in such manner as to prevent the spread of a quarantinable disease which affects people.

"Reportable cancers" means those cancers included in the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) Program.

"Reportable disease" means any disease designated by this chapter.

"Severe skin disorder" means those dermatoses, burns, and other severe skin disorders which result in death or which require hospitalization or other multiple courses of medical therapy.

"Sexually transmitted disease or infection" means a disease or infection as identified by this chapter that is transmitted through sexual practices. "Sexually transmitted disease or infection" includes, but is not limited to, acquired immunodeficiency syndrome (AIDS), chlamydia, gonorrhea, hepatitis B and hepatitis C, human immunodeficiency virus (HIV), human papillomavirus, and syphilis.

"Suspected case" means an individual that presents with clinical signs or symptoms indicative of a reportable or quarantinable disease.

"Toxic agent" means any noxious substance in solid, liquid or gaseous form capable of producing illness in humans including, but not limited to, pesticides, heavy metals, organic and inorganic dusts and organic solvents. Airborne toxic agents may be in the form of dusts, fumes, vapors, mists, gases or smoke.

"Toxic hepatitis" means any acute or subacute necrosis of the liver or other unspecified chemical hepatitis caused by exposure to nonmedicinal toxic agents other than ethyl alcohol including, but not limited to, carbon tetrachloride, chloroform, tetrachloroethane, trichloroethylene, phosphorus, trinitrotoluene (TNT), chloronapthalenes, methylenedianilines, ethylene dibromide, and organic solvents. (ICD-10 codes K71.0 to K71.9)

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.2(139A) Purpose and authority.

1.2(1) *Purpose.* The purpose of this chapter is to establish rules that identify diseases, poisonings and conditions, and incidents that are to be reported to the department in accordance with Iowa Code chapters 135, 136A, 139A, 141A, and 144. These rules also establish the information to be reported, how and when to report, and who is to report. This chapter provides for disease investigation and disease control through preventive measures including but not limited to quarantine and isolation.

1.2(2) *Authority.* The director is the principal officer of the state to administer disease, poisoning and condition, and incident reporting and control. The State Health Registry of Iowa, administered by the Department of Epidemiology of the College of Public Health at the University of Iowa, is a public health authority for purposes of collecting cancer data in accordance with this chapter.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

REPORTABLE COMMUNICABLE AND INFECTIOUS DISEASES

641—1.3(139A,141A) Reportable communicable and infectious diseases. Reportable communicable and infectious diseases are those listed in Appendix A. The director may also designate any disease, poisoning or condition or syndrome temporarily reportable for the purpose of a special investigation.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.4(135,139A) Reporting of reportable communicable and infectious diseases. Each case of a reportable disease is required to be reported to the Iowa Department of Public Health, Lucas State Office Building, 321 E. 12th Street, Des Moines, Iowa 50319-0075, in a manner specified by this chapter.

1.4(1) *Who is required to report communicable and infectious diseases.*

a. Health care providers, hospitals, clinical laboratories, and other health care facilities are required to report cases of reportable communicable and infectious diseases.

b. School nurses are required to report suspected cases of reportable diseases occurring among the children supervised.

c. School officials, through the principal or superintendent as appropriate, are required to report when there is no school nurse.

d. Laboratories are required to report cases of reportable diseases and results obtained in the examination of all specimens which yield evidence of or are reactive for sexually transmitted diseases.

e. Poison control and poison information centers are required to report inquiries about cases of reportable diseases received by them.

f. Medical examiners are required to report their investigatory findings of any death which was caused by or otherwise involved a reportable disease.

g. Occupational nurses are required to report cases of reportable diseases.

h. Hospitals, health care providers and clinical laboratories outside the state of Iowa shall immediately report any confirmed or suspect case of a reportable disease, poisoning or condition in an Iowa resident.

1.4(2) *What to report.* Each report shall contain all of the following information:

a. The patient's name.

b. The patient's address.

c. The patient's date of birth.

d. The sex of the patient.

e. The race and ethnicity of the patient.

f. The patient's marital status.

g. The patient's telephone number.

h. The name and address of the laboratory.

i. The date the test was found to be positive and the collection date.

j. The name and address of the health care provider who performed the test

k. If the patient is female, whether the patient is pregnant.

l. The name of the reportable disease.

1.4(3) *How to report.*

a. Immediate reporting by telephone of diseases identified in Appendix A as immediately reportable. A health care provider and a public, private, or hospital clinical laboratory shall immediately report any confirmed or suspected case of a disease identified in Appendix A as immediately reportable to the department's disease notification hotline at 1-800-362-2736. The report shall include all information required by 1.4(2) and the following:

(1) The stage of the disease process.

(2) Clinical status.

(3) Any treatment provided for the disease.

(4) All household and other known contacts.

(5) Whether household and other known contacts have been examined and the results of such examinations.

b. Other diseases that carry serious consequences or spread rapidly. A health care facility, health care provider and a public, private, or hospital clinical laboratory shall immediately report any confirmed or suspected case of a common source epidemic or disease outbreak of unusual numbers by telephone to the department's 24/7 disease reporting telephone hotline at 1-800-362-2736.

c. Reporting of other reportable diseases. Cases of other reportable communicable or infectious diseases not included in 1.4(3)*"a"* shall be reported to the department in accordance with Appendix A by mail, telephone, facsimile, or other secure electronic means. The preferred method is secure Web-based

reporting when available. If the department determines that reporting by mail hinders the application of organized control measures to protect the public health, the department may require that the reportable disease be reported by telephone, facsimile or secure Web-based reporting.

1.4(4) *Contagious or infectious disease notification at time of death.* The purpose of this subrule is to establish contagious or infectious disease notification requirements for the information of any person handling a dead body.

a. A health care provider attending a person prior to the person's death shall, at the time of death, place with the body a written notice which specifies or signifies either "known contagious or infectious disease" or "suspected contagious or infectious disease."

b. The health care facility in which the health care provider is working shall be responsible for establishing written procedures and implementing the specific internal practices necessary to satisfy this notification requirement.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

REPORTABLE POISONINGS AND CONDITIONS—NONCOMMUNICABLE

641—1.5(139A,135) Reportable poisonings and conditions. Reportable poisonings and conditions are those listed in Appendix B. The director may also designate any disease, poisoning or condition or syndrome temporarily reportable for the purpose of a special investigation.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.6(135,139A) Reporting poisonings and conditions.

1.6(1) *Who is required to report.*

a. Health care providers, hospitals, and clinical laboratories and other health care facilities are required to report cases of reportable poisonings and conditions. Health care providers are exempted from reporting blood lead testing if the laboratory performing the analysis provides the report containing the required information to the department.

b. School nurses are required to report suspected cases of a reportable poisoning or condition occurring among the children supervised.

c. School officials, through the principal or superintendent as appropriate, are required to report when there is no school nurse.

d. Poison control and poison information centers are required to report inquiries about cases of a reportable poisoning or condition received by them.

e. Medical examiners are required to report their investigatory findings of any death which was caused by or otherwise involved a reportable poisoning or condition.

f. Occupational nurses are required to report cases of reportable poisonings and conditions.

g. Hospitals, health care providers and clinical laboratories outside the state of Iowa shall immediately report any confirmed or suspected case of a reportable poisoning or condition in an Iowa resident.

1.6(2) *What to report.* Each report shall contain all of the following information:

a. The patient's name.
b. The patient's address.
c. The patient's date of birth.
d. The sex of the patient.
e. The race and ethnicity of the patient.
f. The patient's marital status.
g. The patien's telephone number.
h. The name and address of the laboratory.
i. The collection date.
j. The analytical result.
k. In the case of blood lead testing, whether the sample is a capillary or venous blood sample.
l. For conditions not identified by a laboratory analysis, the date that the condition was diagnosed.
m. The name and address of the health care provider who performed the test.

n. If the patient is female, whether the patient is pregnant.

o. In the case of occupational conditions, the name of the patient's employer.

1.6(3) *How to report.*

a. Blood lead testing. All analytical results greater than or equal to 20 micrograms per deciliter (μg/dL) in a child under the age of six years or a pregnant woman shall be reported to the department immediately by telephone at 1-800-972-2026. All other analytical results shall be reported to the department at least weekly in an electronic format specified by the department.

b. Each instance of carbon monoxide poisoning shall be reported to the department immediately by telephone at 1-800-972-2026.

c. Reportable poisonings and conditions other than blood lead testing and carbon monoxide poisoning shall be reported to the department in accordance with Appendix B.

d. Occupational nurses shall submit cases of occupationally related reportable poisonings or conditions on report forms provided by the department.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

INVESTIGATION

641—1.7(135,139A) Investigation of reportable diseases. A health care provider and a public, private, or hospital clinical laboratory shall assist in a disease investigation conducted by the department, a local board, or a local department.

1.7(1) A health care provider and a clinical laboratory shall provide the department, local board, or local department with all information necessary to conduct the investigation, including but not limited to medical records; exposure histories; medical histories; contact information; and test results necessary to the investigation, including positive, pending, and negative test results.

1.7(2) Issuance of investigatory subpoenas.

a. The department may upon the written request of a local board of health, the state public health medical director and epidemiologist or designee, or the state public health veterinarian or designee, subpoena records, reports, or any other evidence necessary to conduct a disease investigation. The subpoena shall be signed by the division director of the division of acute disease prevention and emergency response or the division director's designee following review and approval of the written request for subpoena.

b. A written request for a subpoena shall contain the following:

(1) The name and address of the person, facility, or entity to which the subpoena will be directed;

(2) A specific description of the records, reports, or other evidence requested; and

(3) An explanation of why the documents sought to be subpoenaed are necessary for the department to conduct the disease investigation.

c. Each subpoena shall contain:

(1) The name and address of the person, facility, or entity to which the subpoena is directed;

(2) A description of the records, reports, or other evidence requested;

(3) The date, time, and location for production, inspection, or copying;

(4) The time within which a motion to quash or modify the subpoena must be filed;

(5) The signature, address, and telephone number of the division director;

(6) The date of issuance; and

(7) A return of service.

d. Process to challenge a subpoena.

(1) Any person who is aggrieved or adversely affected by compliance with the subpoena and who desires to challenge the subpoena must, within five days after service of the subpoena, or before the time specified for compliance if such time is less than five days, file with the department a motion to quash or modify the subpoena. The motion shall describe the reasons why the subpoena should be quashed or modified, and may be accompanied by legal briefs or factual affidavits.

(2) Upon receipt of a timely motion to quash or modify a subpoena, the department may request an administrative law judge to issue a decision. Oral argument may be scheduled at the discretion of the

administrative law judge. The administrative law judge may quash or modify the subpoena, deny the motion, or issue an appropriate protective order.

(3) A person aggrieved by a ruling of an administrative law judge who desires to challenge that ruling must appeal the ruling to the department by serving on the department director, either in person or by certified mail, a notice of appeal within ten days after the service of the decision of the administrative law judge. The department director's decision is final for purposes of judicial review.

e. Subpoenas issued under this subrule and requests, motions, and pleadings related to the issuance of subpoenas are confidential pursuant to Iowa Code sections 139A.3 and 22.7.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

ISOLATION AND QUARANTINE

641—1.8(139A) Isolation and quarantine. Isolation and quarantine should be consistent with guidelines provided by the Centers for Disease Control and Prevention's 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, June 2007; http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Isolation2007.pdf.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.9(135,139A) Quarantine and isolation.

1.9(1) *Examination, testing, and treatment of quarantinable diseases.*

a. A health care provider who attends an individual with a suspected or active quarantinable disease shall make all reasonable efforts in accordance with guidance from a local health department or the department to examine or cause all household and other known contacts of the individual to be examined by a physician. The physician shall promptly report to the department the results of such examination. If the individual refuses or is unable to undergo examination, the health care provider shall promptly report such information to the department.

b. When required by the department, all contacts not examined by a physician, including all adult and minor contacts, shall submit to a diagnostic test or tests. If any suspicious abnormality is found, steps satisfactory to the department shall be taken to refer the individual promptly to a physician or appropriate medical facility for further evaluation and, if necessary, treatment. The referring health care provider or facility shall notify the receiving health care provider or facility of the suspicious abnormality. When requested by the department, a physician shall report the results of the examination of a contact to the case or suspected case or incident.

c. Upon order of the department or local board of health, an individual with a suspected or active quarantinable disease shall not attend the workplace or school and shall not be present at other public places until the individual receives the approval of the department or a local board of health to engage in such activity. Upon order of the department or local board of health, employers, schools and other public places shall exclude an individual with a suspected or active quarantinable disease. An individual may also be excluded from other premises or facilities if the department or a local board of health determines the premises or facilities cannot be maintained in a manner adequate to protect others against the spread of the disease.

d. A person diagnosed with or clinically suspected of having infectious tuberculosis shall complete voluntary treatment until, in the opinion of the attending physician or the state public health medical director and epidemiologist, the person's tuberculosis is cured or such person is no longer a threat to public health. If such person refuses to complete the course of voluntary treatment, the department or local board of health may issue an order compelling mandatory treatment. Such order shall include the identity of the person subject to the mandatory treatment order, a description of the treatment ordered, the medical basis upon which the treatment is ordered, and a description of the potential medical and legal consequences of violating such order. A person who violates a mandatory treatment order may be subject to the penalties provided in Iowa Code section 135.38 or 137.21 and may be placed under mandatory quarantine or isolation in accordance with the provisions of this chapter.

e. A person diagnosed with extrapulmonary tuberculosis or clinically suspected of having infectious tuberculosis who fails to comply with a physician's recommendation for diagnostic testing

may be ordered to undergo diagnostic testing by the department or local board of health. Such order shall include the identity of the person subject to mandatory diagnostic testing, a description of the diagnostic testing ordered, the medical basis upon which the diagnostic testing is ordered, and a description of the potential medical and legal consequences of violating such order. A person who violates a mandatory diagnostic testing order may be subject to the penalties provided in Iowa Code section 135.38 or 137.21 and may be placed under mandatory quarantine or isolation in accordance with the provisions of this chapter.

1.9(2) *General provisions.*

a. Voluntary confinement. Prior to instituting mandatory isolation or quarantine pursuant to this rule, the department or a local board of health may request that an individual or group of individuals voluntarily confine themselves to a private home or other facility.

b. Quarantine and isolation. The department and local boards of health are authorized to impose and enforce quarantine and isolation restrictions. Quarantine and isolation shall rarely be imposed by the department or by local boards of health. If a quarantinable disease occurs in Iowa, individuals with a suspected or active quarantinable disease and contacts to the case may be quarantined or isolated as the particular situation requires. Any quarantine or isolation imposed by the department or a local board of health shall be established and enforced in accordance with this rule.

1.9(3) *Conditions and principles.* The department and local boards of health shall adhere to all of the following conditions and principles when isolating or quarantining individuals or a group of individuals:

a. The isolation or quarantine shall be by the least restrictive means necessary to prevent the spread of a communicable or possibly communicable disease to others and may include, but not be limited to, confinement to private homes, other private premises, or public premises.

b. Isolated individuals shall be confined separately from quarantined individuals.

c. The health status of isolated or quarantined individuals shall be monitored regularly to determine if the individuals require further or continued isolation or quarantine.

d. If a quarantined individual subsequently becomes infected or is reasonably believed to have become infected with a communicable or possibly communicable disease, the individual shall be promptly removed to isolation.

e. Isolated or quarantined individuals shall be immediately released when the department or local board of health determines that the individuals pose no substantial risk of transmitting a communicable or possibly communicable disease.

f. The needs of isolated or quarantined individuals shall be addressed in a systematic and competent fashion including, but not limited to, providing adequate food; clothing; shelter; means of communicating with those in and outside of isolation or quarantine; medication; and competent medical care.

g. The premises used for isolation or quarantine shall be maintained in a safe and hygienic manner and shall be designed to minimize the likelihood of further transmission of infection or other harm to isolated or quarantined individuals.

h. To the extent possible, cultural and religious beliefs shall be considered in addressing the needs of individuals in isolation or quarantine premises and in establishing and maintaining the premises.

1.9(4) *Isolation and quarantine premises.*

a. Sites of isolation or quarantine shall be prominently placarded with isolation or quarantine signs prescribed and furnished by the department and posted on all sides of the building wherever access is possible.

b. An individual subject to isolation or quarantine shall obey the rules and orders of the department or the local board of health and shall not go beyond the isolation or quarantine premises.

c. The department or a local board of health may authorize physicians, health care workers, or others access to individuals in isolation or quarantine as necessary to meet the needs of isolated or quarantined individuals.

d. No individual, other than an individual authorized by the department or a local board of health, shall enter isolation or quarantine premises. If the department has requested the assistance of

law enforcement in enforcing the isolation or quarantine, the department shall provide law enforcement personnel with a list of individuals authorized to enter the isolation or quarantine premises.

e. Any individual entering an isolation or quarantine premises with or without authorization of the department or a local board of health may be isolated or quarantined pursuant to this rule.

1.9(5) *Isolation and quarantine by local boards of health.*

a. A local board of health may:

(1) Isolate individuals who are presumably or actually infected with a quarantinable disease;

(2) Quarantine individuals who have been exposed to a quarantinable disease;

(3) Establish and maintain places of isolation and quarantine; and

(4) Adopt emergency rules and issue orders as necessary to establish, maintain, and enforce isolation or quarantine.

b. Isolation and quarantine undertaken by a local board of health shall be accomplished according to the rules and regulations of the local board of health so long as such rules are not inconsistent with this chapter.

1.9(6) *Isolation and quarantine by the Iowa department of public health.*

a. Authority.

(1) The department, through the director, the department's medical director, or the director's or medical director's designee, may:

1. Isolate individuals or groups of individuals who are presumably or actually infected with a quarantinable disease; and

2. Quarantine individuals or groups of individuals who have been exposed to a quarantinable disease, including individuals who are unable or unwilling to undergo examination, testing, vaccination, or treatment, pursuant to Iowa Code section 135.144(9).

(2) The department may:

1. Establish and maintain places of isolation and quarantine; and

2. Adopt emergency rules and issue orders as necessary to establish, maintain, and enforce isolation or quarantine.

(3) Isolation and quarantine undertaken by the department, including isolation and quarantine undertaken by the department in the event of a public health disaster, shall be established pursuant to paragraph 1.9(6)*"b"* or *"c."*

b. Temporary isolation and quarantine without notice. The department may temporarily isolate or quarantine an individual or groups of individuals through an oral order, without notice, only if delay in imposing the isolation or quarantine would significantly jeopardize the department's ability to prevent or limit the transmission of a communicable or possibly communicable disease to others. If the department imposes temporary isolation or quarantine of an individual or groups of individuals through an oral order, the department shall issue a written order as soon as is reasonably possible and in all cases within 24 hours of issuance of the oral order if continued isolation or quarantine is necessary to prevent or limit the transmission of a communicable or possibly communicable disease.

c. Written order. The department may isolate or quarantine an individual or groups of individuals through a written order issued pursuant to this rule.

(1) The written order shall include all of the following:

1. The identity of the individual, individuals, or groups of individuals subject to isolation or quarantine.

2. The premises subject to isolation or quarantine.

3. The date and time at which isolation or quarantine commences.

4. The suspected communicable disease.

5. A description of the less restrictive alternatives that were attempted and were unsuccessful, or the less restrictive alternatives that were considered and rejected, and the reasons such alternatives were rejected.

6. A statement of compliance with the conditions and principles for isolation and quarantine specified in subrule 1.9(3).

7. The legal authority under which the order is requested.

8. The medical basis upon which isolation or quarantine is justified.

9. A statement advising the individual, individuals, or groups of individuals of the right to appeal the written order pursuant to subrule 1.9(7) and the rights of individuals and groups of individuals subject to quarantine and isolation as listed in subrule 1.9(8).

10. A copy of this chapter and the relevant definitions.

(2) A copy of the written order shall be provided to the individual to be isolated or quarantined within 24 hours of issuance of the order in accordance with any applicable process authorized by the Iowa Rules of Civil Procedure. If the order applies to a group or groups of individuals and it is impractical to provide individual copies, the order may be posted in a conspicuous place in the isolation or quarantine premises.

1.9(7) *Appeal from order imposing isolation or quarantine.*

a. Contested case. The subject of a department order imposing isolation or quarantine may appeal a written order and has the right to a contested case hearing regarding such appeal. The subject of a department order imposing isolation or quarantine may appeal the order by submitting a written appeal within ten days of receipt of the written order. The appeal shall be addressed to the Department of Public Health, Division of Epidemiology, Emergency Medical Services, and Disaster Operations, Lucas State Office Building, Des Moines, Iowa 50319-0075. Unless stayed by order of the director or a district court, the written order for quarantine or isolation shall remain in force and effect until the appeal is finally determined and disposed of upon its merits.

b. Presiding officer. The presiding officer in a contested case shall be the director or the director's designee. The director or the director's designee may be assisted by an administrative law judge in conducting the contested case hearing. The decision of the director or the director's designee shall be the department's final decision and is subject to judicial review in accordance with the provisions of Iowa Code chapter 17A.

c. Proceeding. The contested case hearing shall be conducted in accordance with the provisions contained at 641—Chapter 173. The hearing shall be held as soon as is practicable, and in no case later than ten days from the date of receipt of the appeal. The hearing may be held by telephonic or other electronic means if necessary to prevent additional exposure to the communicable or possibly communicable disease. In extraordinary circumstances and for good cause shown, the department may apply to continue the hearing date for up to ten additional days on a petition filed pursuant to this rule. The presiding officer may use discretion in granting a continuance giving due regard to the rights of the affected individuals, the protection of the public's health, and the availability of necessary witnesses and evidence.

d. Judicial review. The aggrieved party to the final decision of the department may petition for judicial review of that action pursuant to Iowa Code chapter 17A. Petitions for judicial review shall be filed within 30 days after the decision becomes final.

e. Immediate judicial review of department order. The department acknowledges that in certain circumstances the subject or subjects of a department order may desire immediate judicial review of a department order in lieu of proceeding with the contested case process. The department recognizes that the procedural step of pursuing exhaustion of administrative remedies may be inadequate for purposes of Iowa Code section 17A.19, and the department may consent to immediate jurisdiction of the district court when requested by the subject or subjects of a department order and justice so requires. Unless stayed by order of the director or a district court, the written order for quarantine or isolation shall remain in force and effect until the judicial review is finally determined and disposed of upon its merits.

1.9(8) *Rights of individuals and groups of individuals subject to isolation or quarantine.* Any individual or group of individuals subject to isolation or quarantine shall have the following rights:

a. The right to be represented by legal counsel.

b. The right to be provided with prior notice of the date, time, and location of any hearing.

c. The right to participate in any hearing. The hearing may be held by telephonic or other electronic means if necessary to prevent additional exposure to the communicable or possibly communicable disease.

d. The right to respond and present evidence and argument on the individual's own behalf in any hearing.

e. The right to cross-examine witnesses who testify against the individual.

f. The right to view and copy all records in the possession of the department which relate to the subject of the written order.

1.9(9) *Consolidation of claims.* In any proceeding brought pursuant to this rule, to promote the fair and efficient operation of justice and having given due regard to the rights of the affected individuals, the protection of the public's health, and the availability of necessary witnesses and evidence, the department or a court may order the consolidation of individual claims into group claims, if all of the following conditions exist:

a. The number of individuals involved or to be affected is so large that individual participation is impractical.

b. There are questions of law or fact common to the individual claims or rights to be determined.

c. The group claims or rights to be determined are typical of the affected individuals' claims or rights.

d. The entire group will be adequately represented in the consolidation.

1.9(10) *Implementation and enforcement of isolation and quarantine.*

a. Jurisdictional issues. The department has primary jurisdiction to isolate or quarantine individuals or groups of individuals if the communicable disease outbreak has affected more than one county or has multicounty, statewide, or interstate public health implications. When imposing isolation or quarantine, the department shall coordinate with the local health department as appropriate. If isolation or quarantine is imposed by the department, a local board of health or local health department may not alter, amend, modify, or rescind the isolation or quarantine order.

b. Assistance of local boards of health and local health departments. If isolation or quarantine is imposed by the department, the local boards of health and the local health departments in the affected areas shall assist in the implementation of the isolation or quarantine order.

c. Assistance of law enforcement. Pursuant to Iowa Code section 135.35, all peace officers of the state shall enforce and execute a lawful department order for isolation or quarantine within their respective jurisdictions. The department shall take all reasonable measures to minimize the risk of exposure to peace officers and others assisting with enforcement of an isolation or quarantine order.

d. Penalty. Pursuant to Iowa Code section 135.38, any individual who knowingly violates a lawful department order for isolation or quarantine, whether written or oral, shall be guilty of a simple misdemeanor. The court-ordered sentence may include a fine of up to $500 and imprisonment not to exceed 30 days.

e. Enforcement action. The department may file a civil action in Polk County district court or in the district court for the county in which the individual resides or is located to enforce a department order for isolation or quarantine. Such action shall be filed in accordance with the Iowa Rules of Civil Procedure.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.10 and **1.11** Reserved.

641—1.12(135,137,139A) Quarantine and isolation—model rule for local boards.

1.12(1) *Applicability.* The provisions of rule 641—1.12(135,137,139A) are applicable in jurisdictions in which a local board has adopted this rule by reference in accordance with Iowa Code section 137.6. This rule shall not be construed to require a local board to adopt this model rule.

1.12(2) *Definitions.*

"Board" means [insert the name of the city, county, or district board of health].

"Department" means the Iowa department of public health.

"Isolation" means the separation of persons or animals presumably or actually infected with a communicable disease, or that are disease carriers, for the usual period of communicability of that

disease. Isolation shall be in such places, marked by placards if necessary, and under such conditions to prevent the direct or indirect conveyance of the infectious agent or contagion to susceptible individuals.

"Quarantinable disease" means any communicable disease which presents a risk of serious harm to public health and which may require isolation or quarantine to prevent its spread. "Quarantinable disease" includes but is not limited to cholera; diphtheria; infectious tuberculosis; plague; smallpox; yellow fever; viral hemorrhagic fevers, including Lassa, Marburg, Ebola, Crimean-Congo, South American, and others not yet isolated or named; novel influenza; and severe acute respiratory syndrome (SARS).

"Quarantine" means the limitation of freedom of movement of persons or animals that have been exposed to a communicable disease, within specified limits marked by placards, for a period of time equal to the longest usual incubation period of the disease. The limitation of movement shall be in such manner as to prevent the spread of a communicable disease.

1.12(3) *General provisions.*

a. Voluntary confinement. Prior to instituting mandatory isolation or quarantine pursuant to this rule, the board may request that an individual or group of individuals voluntarily confine themselves to a private home or other facility.

b. Quarantine and isolation. The board is authorized to impose and enforce quarantine and isolation restrictions. Quarantine and isolation shall rarely be imposed by the board. If a quarantinable disease occurs in Iowa, individuals with a suspected or active quarantinable disease and contacts to the case may be quarantined or isolated as the particular situation requires. Any quarantine or isolation imposed by the board shall be established and enforced in accordance with this rule.

c. The local board of health shall notify, consult and work cooperatively with the Iowa department of agriculture and land stewardship and the state veterinarian office on issues relating to isolation and quarantine of animals.

1.12(4) *Conditions and principles.* The board shall adhere to all of the following conditions and principles when isolating or quarantining individuals or a group of individuals:

a. The isolation or quarantine shall be by the least restrictive means necessary to prevent the spread of a communicable or possibly communicable disease to others and may include, but is not limited to, confinement to private homes, other private premises, or public premises.

b. Isolated individuals shall be confined separately from quarantined individuals.

c. The health status of isolated or quarantined individuals shall be monitored regularly to determine if the individuals require further or continued isolation or quarantine.

d. If a quarantined individual subsequently becomes infected or is reasonably believed to have become infected with a communicable or possibly communicable disease, the individual shall be promptly removed to isolation.

e. Isolated or quarantined individuals shall be immediately released when the board determines that the individuals pose no substantial risk of transmitting a communicable or possibly communicable disease.

f. The needs of isolated or quarantined individuals shall be addressed in a systematic and competent fashion including, but not limited to, providing adequate food; clothing; shelter; means of communicating with those in and outside of isolation or quarantine; medication; and competent medical care.

g. The premises used for isolation or quarantine shall be maintained in a safe and hygienic manner and shall be designed to minimize the likelihood of further transmission of infection or other harm to isolated or quarantined individuals.

h. To the extent possible, cultural and religious beliefs shall be considered in addressing the needs of individuals in isolation and quarantine premises and in establishing and maintaining the premises.

1.12(5) *Isolation and quarantine premises.*

a. Sites of isolation or quarantine shall be prominently placarded with isolation or quarantine signs prescribed and furnished by the department and posted on all sides of the building wherever access is possible.

b. An individual subject to isolation or quarantine shall obey the rules and orders of the board and shall not go beyond the isolation or quarantine premises.

c. The department or the board may authorize physicians, health care workers, or others access to individuals in isolation or quarantine as necessary to meet the needs of isolated or quarantined individuals.

d. No individual, other than an individual authorized by the department or the board, shall enter an isolation or quarantine premises. If the department has requested the assistance of law enforcement in enforcing the isolation or quarantine, the department shall provide law enforcement personnel with a list of individuals authorized to enter the isolation or quarantine premises.

e. Any individual entering an isolation or quarantine premises with or without authorization of the department or the board may be isolated or quarantined pursuant to this rule.

1.12(6) *Isolation and quarantine.*

a. Authority. The board may:

(1) Isolate individuals who are presumably or actually infected with a quarantinable disease;

(2) Quarantine individuals who have been exposed to a quarantinable disease;

(3) Establish and maintain places of isolation and quarantine; and

(4) Adopt emergency rules and issue orders as necessary to establish, maintain, and enforce isolation or quarantine.

b. Isolation and quarantine undertaken by the board shall be accomplished in accordance with this rule.

c. Temporary isolation and quarantine without notice. The board may temporarily isolate or quarantine an individual or groups of individuals through an oral order, without notice, only if delay in imposing the isolation or quarantine would significantly jeopardize the board's ability to prevent or limit the transmission of a communicable or possibly communicable disease to others. If the board imposes temporary isolation or quarantine of an individual or groups of individuals through an oral order, the board shall issue a written order as soon as is reasonably possible and in all cases within 24 hours of issuance of the oral order if continued isolation or quarantine is necessary to prevent or limit the transmission of a communicable or possibly communicable disease.

d. Written order. The board may isolate or quarantine an individual or groups of individuals through a written order issued pursuant to this rule.

(1) The written order shall include all of the following:

1. The identity of the individual, individuals, or groups of individuals subject to isolation or quarantine.

2. The premises subject to isolation or quarantine.

3. The date and time at which isolation or quarantine commences.

4. The suspected communicable disease.

5. A description of the less restrictive alternatives that were attempted and were unsuccessful, or the less restrictive alternatives that were considered and rejected, and the reasons such alternatives were rejected.

6. A statement of compliance with the conditions and principles for isolation and quarantine specified in subrule 1.12(4).

7. The legal authority under which the order is imposed.

8. The medical basis upon which isolation or quarantine is justified.

9. A statement advising the individual, individuals, or groups of individuals of the right to appeal the written order pursuant to subrule 1.12(7) and the rights of individuals and groups of individuals subject to quarantine and isolation as listed in subrule 1.12(8).

10. A copy of this rule and the relevant definitions.

(2) A copy of the written order shall be provided to the individual to be isolated or quarantined within 24 hours of issuance of the order in accordance with any applicable process authorized by the Iowa Rules of Civil Procedure. If the order applies to a group or groups of individuals and it is impractical to provide individual copies, the order may be posted in a conspicuous place in the isolation or quarantine premises.

1.12(7) *Appeal from order imposing isolation or quarantine.*

a. Appeal. The subject of a board order imposing isolation or quarantine may appeal a written order by submitting a written appeal within ten days of receipt of the written order. The appeal shall be addressed to [insert name of board and board address]. Unless stayed by order of the board or a district court, the written order for quarantine or isolation shall remain in force and effect until the appeal is finally determined and disposed of upon its merits.

b. Proceeding. The appeal proceeding shall be conducted in accordance with this rule [or insert specific board rule governing appeal proceedings]. The proceeding shall be held as soon as is practicable, and in no case later than ten days from the date of receipt of the appeal. The hearing may be held by telephonic or other electronic means if necessary to prevent additional exposure to the communicable or possibly communicable disease. In extraordinary circumstances and for good cause shown, the board may continue the proceeding date for up to ten days, giving due regard to the rights of the affected individuals, the protection of the public's health, and the availability of necessary witnesses and evidence. At the appeal proceeding, the subject of the appeal shall have the right to introduce evidence on all issues relevant to the order. The board, by majority vote, may modify, withdraw, or order compliance with the order under appeal.

c. Judicial review. The aggrieved party to the final decision of the board may petition for judicial review of that action by filing an action in the appropriate district court. Petitions for judicial review shall be filed within 30 days after the decision becomes final.

d. Immediate judicial review of board order. The board acknowledges that in certain circumstances the subject or subjects of a board order may desire immediate judicial review of a board order in lieu of proceeding with the board's appeal process. The board may consent to immediate jurisdiction of the district court when requested by the subject or subjects of a board order and justice so requires. Unless stayed by order of the board or a district court, the written order for quarantine or isolation shall remain in force and effect until the judicial review is finally determined and disposed of upon its merits.

1.12(8) *Rights of individuals and groups of individuals subject to isolation or quarantine.* Any individual or group of individuals subject to isolation or quarantine shall have the following rights:

a. The right to be represented by legal counsel.

b. The right to be provided with prior notice of the date, time, and location of any hearing.

c. The right to participate in any hearing. The hearing may be held by telephonic or other electronic means if necessary to prevent additional exposure to the communicable or possibly communicable disease.

d. The right to respond and present evidence and argument on the individual's own behalf in any hearing.

e. The right to cross-examine witnesses who testify against the individual.

f. The right to view and copy all records in the possession of the board which relate to the subject of the written order.

1.12(9) *Consolidation of claims.* In any proceeding brought pursuant to this rule, to promote the fair and efficient operation of justice and having given due regard to the rights of the affected individuals, the protection of the public's health, and the availability of necessary witnesses and evidence, the board or a court may order the consolidation of individual claims into group claims, if all of the following conditions exist:

a. The number of individuals involved or to be affected is large enough that consolidation would be the best use of resources.

b. There are questions of law or fact common to the individual claims or rights to be determined.

c. The group claims or rights to be determined are typical of the affected individuals' claims or rights.

d. The entire group will be adequately represented in the consolidation.

1.12(10) *Implementation and enforcement of isolation and quarantine.*

a. Jurisdictional issues. The department has primary jurisdiction to isolate or quarantine individuals or groups of individuals if the communicable disease outbreak has affected more than one

county or has multicounty, statewide, or interstate public health implications. If isolation or quarantine is imposed by the department, the board may not alter, amend, modify, or rescind the isolation or quarantine order.

b. Assistance of local boards of health and local health departments. If isolation or quarantine is imposed by the department, the local boards of health and the local health departments in the affected areas shall assist in the implementation of the isolation or quarantine order.

c. Penalty. Pursuant to Iowa Code sections 137.21 and 139A.25(1), any individual who violates a lawful board order for isolation or quarantine, whether written or oral, shall be guilty of a simple misdemeanor. The court-ordered sentence may include a fine of up to $500 and imprisonment not to exceed 30 days.

d. Enforcement action. The board, through the office of the county attorney, may file a civil action in the appropriate district court to enforce a board order for isolation or quarantine. Such action shall be filed in accordance with the Iowa Rules of Civil Procedure.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.13(135,139A) Area quarantine.

1.13(1) *General provisions.* The department and local boards of health are authorized to impose and enforce area quarantine in accordance with this rule. Area quarantine shall rarely be imposed by the department or by local boards of health.

1.13(2) *Conditions and principles.* The department and local boards of health shall adhere to all of the following conditions and principles when imposing and enforcing area quarantine:

a. Area quarantine shall be imposed by the least restrictive means necessary to prevent or contain the spread of a suspected or confirmed quarantinable disease or suspected or known hazardous or toxic agent.

b. Area quarantine shall be immediately terminated when the department or a local board of health determines that no substantial risk of exposure to a quarantinable disease or hazardous or toxic agent continues to exist.

c. The geographic boundaries of an area quarantine shall be established by risk assessment procedures including medical and scientific analysis of the quarantinable disease or hazardous or toxic agent, the location of the affected area, the risk of spread or contamination, and other relevant information.

1.13(3) *Area quarantine sites.*

a. Sites of area quarantine shall be prominently identified to restrict ingress to and egress from the area, to the extent practicable. The department or a local board of health may placard or otherwise identify the site, or may request the assistance of law enforcement in identifying the site.

b. No individual, other than an individual authorized by the department or a local board of health, shall enter a building, structure, or other physical location subject to area quarantine. The department or a local board of health may authorize public health officials, environmental specialists, health care providers, or others access to an area quarantine site as necessary to conduct public health investigations, to decontaminate the site, or for other public health purposes. Notwithstanding any provision in this chapter to the contrary, law enforcement, fire service, and emergency medical service providers may enter an area quarantine site to provide emergency response services or to conduct emergency law enforcement investigations or other emergency activities without authorization by the department or a local board of health. If the department has requested the assistance of law enforcement in enforcing the area quarantine, the department shall provide law enforcement personnel with a list of individuals authorized to enter the area quarantine site.

c. An individual authorized to enter an area quarantine site may be required to wear personal protective equipment as appropriate.

d. No individual, other than an individual authorized by the department or a local board of health, shall remove any item or object from a building, structure, or other physical location subject to area quarantine.

e. An individual entering an area quarantine site without authorization of the department or a local board of health may be isolated or quarantined pursuant to rule 641—1.9(135,139A) and may be found guilty of a simple misdemeanor.

1.13(4) *Area quarantine by local boards of health or the department of public health.*

a. Authority.

(1) The department, through the director, the department's medical director, or the director or medical director's designee, may impose area quarantine through oral or written order. Prior to imposing area quarantine, the department shall attempt to notify the local board or boards of health in the affected geographic area. If attempts to notify the local boards of health are initially unsuccessful, the department shall continue to make regular notification attempts until successful.

(2) A local board of health may impose area quarantine through oral or written order. Prior to imposing area quarantine, a local board of health shall attempt to notify the department by contacting the director, medical director, or department duty officer by telephone. If attempts to notify the department are initially unsuccessful, the local board of health shall continue to make regular notification attempts until successful.

b. Temporary area quarantine without notice. The department or a local board of health may temporarily impose area quarantine through an oral order, without notice, only if delay in imposing area quarantine would significantly jeopardize the department's or local board's ability to prevent or contain the spread of a suspected or confirmed quarantinable disease or to prevent or contain exposure to a suspected or known hazardous or toxic agent. If the department or local board imposes temporary area quarantine through an oral order, a written order shall be issued as soon as is reasonably possible and in all cases within 24 hours of issuance of the oral order if continued area quarantine is necessary.

c. Written order. The department or local board may impose area quarantine through a written order issued pursuant to this rule.

(1) The written order shall include all of the following:

1. The building or buildings, structure or structures, or other definable physical location, or portion thereof, subject to area quarantine.

2. The date and time at which area quarantine commences and the date and time at which the area quarantine shall be terminated, if known.

3. The suspected or confirmed quarantinable disease or the chemical, biological, radioactive, or other hazardous or toxic agent.

4. A statement of compliance with the conditions and principles for area quarantine specified in subrule 1.13(2).

5. The legal authority under which the order is imposed.

6. The medical or scientific basis upon which area quarantine is justified.

7. A statement advising the owner or owners of the building or buildings, structure or structures, or other definable physical location subject to area quarantine of the right to appeal the written order pursuant to subrule 1.13(5) and the rights of owners of sites subject to area quarantine pursuant to subrule 1.13(6).

8. A copy of 641—Chapter 1 and the relevant provisions of this rule.

(2) A copy of the written order shall be provided to the owner or owners of the building or buildings, structure or structures, or other definable physical location subject to area quarantine within 24 hours of issuance of the order in accordance with any applicable process authorized by the Iowa Rules of Civil Procedure; or, if the order applies to a group of owners and it is impractical to provide individual notice to each owner, the written order shall be posted in a conspicuous place at the site of area quarantine.

1.13(5) *Appeal from order imposing area quarantine.*

a. Contested case. The subject of a department order imposing area quarantine may appeal a written order and has the right to a contested case hearing regarding such appeal. The subject of a department order imposing area quarantine may appeal the order by submitting a written appeal within 10 days of receipt or other notice of the written order. The appeal shall be addressed to the Local Board of Health or to the Department of Public Health, Division of Acute Disease Prevention and Emergency Response, Lucas State Office Building, Des Moines, Iowa 50319-0075. Unless stayed by order of the

director or a district court, the written order for area quarantine shall remain in force and effect until the appeal is finally determined and disposed of upon its merits.

b. Presiding officer. The presiding officer in a contested case shall be the director or the director's designee. The director or the director's designee may be assisted by an administrative law judge in conducting the contested case hearing. The decision of the director or the director's designee shall be the agency's final decision and is subject to judicial review in accordance with the provisions of Iowa Code chapter 17A.

c. Proceeding. The contested case hearing shall be conducted in accordance with the provisions contained at 641—Chapter 173. The hearing shall be held as soon as is practicable, and in no case later than 10 days from the date of receipt of the appeal. In extraordinary circumstances and for good cause shown, the department may apply to continue the hearing date on a petition filed pursuant to this paragraph for up to 10 days, which continuance the presiding officer may grant in the presiding officer's discretion giving due regard to the rights of the affected individuals, the protection of the public's health, and the availability of necessary witnesses and evidence.

d. Judicial review. The aggrieved party to the final decision of the department may petition for judicial review of that action pursuant to Iowa Code chapter 17A. Petitions for judicial review shall be filed within 30 days after the decision becomes final.

e. Immediate judicial review of department order. The department or local board acknowledges that in certain circumstances the subject or subjects of a department order may desire immediate judicial review of a department order in lieu of proceeding with the contested case process. The department recognizes that the procedural step of pursuing exhaustion of administrative remedies may be inadequate for purposes of Iowa Code section 17A.19, and the department may consent to immediate jurisdiction of the district court when requested by the subject or subjects of a department order and justice so requires. Unless stayed by order of the director or a district court, the written order for area quarantine shall remain in force and effect until the judicial review is finally determined and disposed of upon its merits.

1.13(6) *Rights of owners of sites subject to area quarantine.* An owner of a building, structure, or other physical location subject to area quarantine shall have the following rights:

a. The right to be represented by legal counsel.

b. The right to be provided with prior notice of the date, time, and location of any hearing.

c. The right to participate in any hearing.

d. The right to respond and present evidence and argument on the owner's own behalf in any hearing.

e. The right to cross-examine witnesses who testify against the owner or individual.

f. The right to view and copy all records in the possession of the department which relate to the subject of the written order.

1.13(7) *Consolidation of claims.* In any proceeding brought pursuant to this rule, to promote the fair and efficient operation of justice and having given due regard to the rights of the affected individuals, the protection of the public's health, and the availability of necessary witnesses and evidence, the department or a court may order the consolidation of individual claims into group claims, if all of the following conditions exist:

a. The number of individuals involved or who may be affected is so large that individual participation is impractical.

b. There are questions of law or fact common to the individual claims or rights to be determined.

c. The group claims or rights to be determined are typical of the affected individuals' claims or rights.

d. The entire group will be adequately represented in the consolidation.

1.13(8) *Implementation and enforcement of area quarantine.*

a. Jurisdictional issues. The department has primary jurisdiction to impose area quarantine if the quarantinable disease or hazardous or toxic agent has affected more than one county and implicates multicounty or statewide public health concerns. If area quarantine is imposed by the department, a local board of health or local health department may not alter, amend, modify, or rescind the area quarantine order.

b. Assistance of local boards of health and local health departments. If area quarantine is imposed by the department, the local boards of health and the local health departments in the affected areas shall assist in the implementation of the area quarantine.

c. Assistance of law enforcement. Pursuant to Iowa Code section 135.35, all peace officers of the state shall enforce and execute a lawful department order for area quarantine within their respective jurisdictions. The department shall take all reasonable measures to minimize the risk of individual exposure of peace officers and others assisting with enforcement of an area quarantine order.

d. Emergency response, investigation, and decontamination—authority of other agencies. Emergency response, investigation, and decontamination activities in and around an area quarantine site shall be conducted by law enforcement, fire service, emergency medical service providers, or other appropriate federal, state, or local officials in accordance with federal and state law and accepted procedures and protocols for emergency response, investigation, and decontamination. This rule shall not be construed to limit the authority of law enforcement, fire service, emergency medical service providers, or other federal, state, or local officials to conduct emergency response, investigation, or decontamination activities to the extent authorized by federal and state law and accepted procedures and protocols.

e. Penalty. Pursuant to Iowa Code section 135.38, any individual who knowingly violates a lawful department order for area quarantine, whether written or oral, shall be guilty of a simple misdemeanor. The court-ordered sentence may include a fine of up to $500 and imprisonment not to exceed 30 days.

f. Enforcement action. To enforce a department order for quarantine, the department may file a civil action in Polk County District Court or in the district court for the county in which the area quarantine will be enforced. Such action shall be filed in accordance with the Iowa Rules of Civil Procedure.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

SPECIFIC NONCOMMUNICABLE CONDITIONS

641—1.14(139A) Cancer. Each occurrence of a reportable cancer that is diagnosed or treated in an Iowa resident or occurs in a nonresident who is diagnosed or treated in an Iowa facility shall be reported to the State Health Registry of Iowa, administered by the Department of Epidemiology of the College of Public Health at the University of Iowa, by mail, telephone or electronic means.

1.14(1) *Who is required to report.* Occurrences of reportable cancers shall be reported by registrars employed by the State Health Registry of Iowa, registrars employed by health care facilities, and health care providers involved in the diagnosis, care, or treatment of individuals with a reportable cancer.

1.14(2) *What to report.* The content of the reports shall include, but not be limited to, follow-up data and demographic, diagnostic, treatment, and other medical information. Tissue samples may also be submitted under the authority of this rule.

1.14(3) *How to report.* For these particular diseases, physicians and other health practitioners should not send a report to the department.

a. The department has delegated to the State Health Registry of Iowa the responsibility for collecting these data through review of records from hospitals, radiation treatment centers, outpatient surgical facilities, oncology clinics, pathology laboratories, and physician offices.

b. Prior to collecting the data from an office or facility, the State Health Registry of Iowa shall work with the office or facility to develop a process for abstracting records which is agreeable to the office or facility.

c. Where applicable, reportable cancers shall be reported on forms developed and distributed by the State Health Registry of Iowa.

d. Data will be supplemented with information obtained from records from hospitals, radiation treatment centers, outpatient surgical centers, oncology clinics, pathology laboratories, and physician offices through an abstracting process developed by the State Health Registry of Iowa.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.15(144) Congenital and inherited disorders. Each occurrence of a congenital and inherited disorder that is diagnosed or treated in an Iowa resident or occurs in a nonresident who is diagnosed or treated in an Iowa facility is a reportable condition, and records of these congenital and inherited disorders shall be abstracted and maintained in a central registry. Congenital and inherited disorder surveillance shall be performed in order to determine the occurrence and trends of congenital and inherited disorders, to conduct thorough and complete epidemiological surveys, to assist in the planning for and provision of services to children with congenital and inherited disorders and their families, and to identify environmental and genetic risk factors for congenital and inherited disorders.

1.15(1) *Who is required to report.* Occurrences of reportable congenital and inherited disorders shall be reported by registrars employed by the Iowa Registry for Congenital and Inherited Disorders, registrars employed by health care facilities, and health care providers involved in the diagnosis, care, or treatment of individuals with reportable congenital and inherited disorders.

1.15(2) *What to report.* The content of the reports shall include, but not be limited to, follow-up data and demographic, diagnostic, treatment, and other medical information. Tissue samples may also be submitted under the authority of this rule.

1.15(3) *How to report.*

a. The department has delegated to the Iowa Registry for Congenital and Inherited Disorders the responsibility for collecting these data through review of records from hospitals, radiation treatment centers, outpatient surgical facilities, oncology clinics, pathology laboratories, and physician offices.

b. Prior to collecting the data from an office or facility, the Iowa Registry for Congenital and Inherited Disorders shall work with the office or facility to develop a process for abstracting records.

1.15(4) *Fetal death (stillbirth).* Each occurrence of a fetal death that occurs in an Iowa resident or occurs in a nonresident who is identified in an Iowa facility is a reportable condition.

a. Providers shall complete the fetal death certificate supplied by the department.

b. Fetal death certificates are to be filed with the department's bureau of vital records within seven days.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

641—1.16(139A) Agriculturally related injury.

1.16(1) *Who is required to report.*

a. Health care providers are required to report all cases of agriculturally related injury attended by them.

b. Clinics, hospitals and other health care facilities are required to report all cases of agriculturally related injury treated at their facility.

c. Health care providers who reside and health care facilities that are located outside the state of Iowa shall report all cases of agriculturally related injury of an Iowa resident that are attended or treated by them.

d. Medical examiners are required to report their investigatory findings of any death occurring within the state of Iowa which was caused by or otherwise involved a reportable agriculturally related injury.

1.16(2) *What to report.* Each report shall contain all of the following information:

a. The patient's name.

b. The patient's address.

c. The patient's date of birth.

d. The sex of the patient.

e. The race and ethnicity of the patient.

f. The patient's marital status.

g. The patient's telephone number.

h. If the patient is female, whether the patient is pregnant.

i. In the case of occupational conditions, the name of the patient's employer.

j. The date that the injury occurred.

k. The name and address of the health care provider who diagnosed and treated the injury, and the name of the reporting site, clinic, or hospital.

l. Injury diagnosis and description, including diagnostic and external cause of injury codes utilizing the international classification of diseases (ICD) coding system.

m. Severity of injury.

1.16(3) *How to report.*

a. All data shall be reported to the department at least quarterly using formats approved by the department. Reports, using the Iowa Agricultural Injury Report Form found at www.idph.state.ia.us, may be submitted by facsimile to (515)281-4529, or by mail to the Iowa Department of Public Health, Bureau of Lead Poisoning Prevention, Occupational Safety and Health Surveillance Program, Lucas State Office Building, 321 E. 12th Street, Des Moines, Iowa 50319-0075. Information may also be reported by telephone to 1-800-972-2026 during normal office hours.

b. Trauma centers may report using the Iowa Trauma Patient Registry COLLECTOR software by indicating "Yes" for farm and agriculturally related injury. For more information about using the Iowa Trauma Patient Registry for reporting, contact the Iowa Department of Public Health Bureau of Emergency Medical Services at 1-800-728-3367.

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

CONFIDENTIALITY

641—1.17(139A,22) Confidentiality.

1.17(1) A report or other information provided to or maintained by the department, a local board, or a local department which identifies a person infected with or exposed to a reportable or other disease or health condition is confidential and shall not be accessible to the public.

1.17(2) The identity of a business named in a report or investigation is confidential and shall not be accessible to the public. If information contained in a report or other information provided to or maintained by the department, a local board, or a local department concerns a business, information disclosing the identity of the business may be released to the public when the state public health medical director and epidemiologist or the director determines such a release of information necessary for the protection of the public.

1.17(3) Reportable disease records and information, with the exception of AIDS and HIV records, which identify a person or a business named in a report, may be disclosed under the following limited circumstances:

a. By and between department employees and agents who have a need for the record in the performance of their duties.

b. By and between department employees and agents and local boards of health and local health departments as necessary to conduct an investigation.

c. By and between department employees and agents and health care providers, laboratories, and hospitals as necessary to conduct an investigation.

d. By and between department employees and agents and employees and agents of federal, state, and local agencies as necessary to conduct an investigation.

e. Reportable disease information may be included in a quarantine or isolation order or placard as necessary to prevent the spread of a quarantinable disease.

f. Pursuant to rule 641—175.9(17A,22) or 641—175.10(17A,22).

[**ARC 8231B**, IAB 10/7/09, effective 11/11/09]

These rules are intended to implement Iowa Code chapters 135, 136A, 139A, 141A and 144.

APPENDIX A
Iowa Department of Public Health
Table of Reportable Communicable and Infectious Diseases

Report cases of the diseases listed in the following table to the department within the time frame specified in the When to Report column and by the reporting method in the How to Report column.

To report diseases immediately, use the 24/7 disease reporting telephone hotline: 1-800-362-2736.

IMMEDIATELY report diseases, syndromes, poisonings and conditions of any kind suspected or caused by a biological, chemical, or radiological agent or toxin when there is reasonable suspicion that the disease, syndrome, poisoning or condition may be the result of a deliberate act such as terrorism.

IMMEDIATELY report to the department outbreaks of any kind, diseases that occur in unusual numbers or circumstances, unusual syndromes, or uncommon diseases. Outbreaks may be infectious, environmental or occupational in origin and include food-borne outbreaks or illness secondary to chemical exposure (e.g., pesticides, anhydrous ammonia).

Report diseases by:
Entering into the Iowa Disease Surveillance System (IDSS): For IDSS-related questions, call the Center for Acute Disease Epidemiology (CADE) at 1-800-362-2736.

Fax: (515)281-5698

Mail:
Iowa Department of Public Health
Center for Acute Disease Epidemiology
Lucas State Office Building
321 E. 12th Street
Des Moines, Iowa 50319

Isolates shall be sent to:
University Hygienic Laboratory
102 Oakdale Campus, H101 OH
Iowa City, Iowa 52242

For specimen submission questions, call (319)335-4500 or go to http://www.uhl.uiowa.edu/.

Diseases	When to Report	How to Report
Acquired immune deficiency syndrome (AIDS) and AIDS-defining conditions	7 days	Report by mail ● Health care providers: use the Pediatric or Adult Confidential Case Report Form ● Laboratories: send copy of lab report or the Iowa Confidential Report of Sexually Transmitted Disease & HIV Infection. Mark envelope "Attention 03" **For HIV/AIDS-related questions, call (515)242-5141**
Anthrax	1 day	Phone, IDSS, or fax

Diseases	When to Report	How to Report
Arboviral disease (includes West Nile Disease, St. Louis, LaCrosse, WEE, EEE, VEE encephalitis)	3 days	Phone, IDSS, fax or mail
Botulism	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Brucellosis (Burcella)	3 days	Phone, IDSS, fax or mail
Campylobacteriosis (Campylobacter)	3 days	Phone, IDSS, fax or mail
Chlamydia	3 days	Use the Iowa Confidential Report of Sexually Transmitted Disease and HIV Infection
Cholera	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Cryptosporidiosis	3 days	Phone, IDSS, fax or mail
Cyclospora	3 days	Phone, IDSS, fax or mail
Diphtheria	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Enterococcus invasive disease	3 days	Laboratories send isolate to the UHL
Escherichia coli shiga toxin-producing and related diseases (includes HUS and TTP)	3 days	Phone, IDSS, fax or mail Laboratories send isolate to the UHL
Giardiasis (Giardia)	3 days	Phone, IDSS, fax or mail
Gonorrhea	3 days	Use the Iowa Confidential Report of Sexually Transmitted Disease and HIV Infection
Group A Streptococcus invasive disease	3 days	Send isolate to the UHL
Haemophilus influenza type B invasive disease	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736 Laboratories send isolate to the UHL
Hansen's disease (leprosy)	3 days	Phone, IDSS, fax or mail
Hantavirus syndromes	3 days	Phone, IDSS, fax or mail
Hepatitis A	1 day	Phone, IDSS or fax
Hepatitis B, C, D, E	3 days	Phone, IDSS, fax or mail
Human immunodeficiency virus (HIV) cases Death of a person with HIV Perinatally exposed newborn and child (newborn and child who was born to an HIV-infected mother)	7 days	Report by mail ● Health care providers: use the Pediatric or Adult Confidential Case Report Form ● Laboratories: send copy of lab report or the Iowa Confidential Report of Sexually Transmitted Disease & HIV Infection. Mark envelope "Attention 03" **For HIV/AIDS-related questions, call (515)242-5141**
Legionellosis (Legionella)	3 days	Phone, IDSS, fax or mail
Listeria monocytogenes invasive disease	1 day	Phone, IDSS, or fax Laboratories send isolate to the UHL
Lyme disease	3 days	Phone, IDSS, fax or mail
Malaria	3 days	Phone, IDSS, fax or mail
Measles (rubeola)	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Meningococcal invasive disease	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736 Laboratories send isolate to the UHL
Mumps	3 days	Phone, IDSS, fax or mail
Pertussis	3 days	Phone, IDSS, fax or mail

Diseases	When to Report	How to Report
Plague	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Poliomyelitis	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Psittacosis	3 days	Phone, IDSS, fax or mail
Rabies, animal	3 days	Phone, IDSS, fax or mail
Rabies, human	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Rocky Mountain spotted fever	3 days	Phone, IDSS, fax or mail
Rubella (including congenital)	1 day	Phone, IDSS, fax or mail
Salmonellosis (Salmonella)	3 days	Phone, IDSS, fax or mail Laboratories send isolate to the UHL
Severe acute respiratory syndrome (SARS)	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Shigellosis (Shigella)	3 days	Phone, IDSS, fax or mail Laboratories send isolate to the UHL
Smallpox	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Staphylococcus aureus invasive disease: Methicillin-resistant invasive disease (number of S. aureus isolates should be reported to the department quarterly) Vancomycin-resistant S. aureus	3 days **Immediately**	Laboratories send isolate to the UHL Mail the number of staphylococcus isolated quarterly to UHL 24/7 disease reporting telephone hotline: 800-362-2736
Streptococcus pneumoniae invasive disease	3 days	Laboratories send isolate to the UHL
Syphilis	3 days	Use the Iowa Confidential Report of Sexually Transmitted Disease and HIV Infection
Tetanus	3 days	Phone, IDSS, fax or mail
Toxic Shock Syndrome	3 days	Phone, IDSS, fax or mail
Trichinosis	3 days	Phone, IDSS, fax or mail
Tuberculosis	3 days	Phone, IDSS, fax or mail
Typhoid fever	1 day	Phone, IDSS or fax
Yellow fever	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736

APPENDIX B
Iowa Department of Public Health
Table of Reportable Poisonings and Conditions

Report cases of the poisonings and conditions listed in the following table to the department within the time frame specified in the When to Report column and by the reporting method in the How to Report column.

To report diseases immediately, use the 24/7 disease reporting telephone hotline: 1-800-362-2736.

IMMEDIATELY report diseases, syndromes, poisonings and conditions of any kind suspected or caused by a biological, chemical, or radiological agent or toxin when there is reasonable suspicion that the disease, syndrome, poisoning or condition may be the result of a deliberate act such as terrorism.

IMMEDIATELY report to the department outbreaks of any kind, diseases that occur in unusual numbers or circumstances, unusual syndromes, or uncommon diseases. Outbreaks may be infectious, environmental or occupational in origin and include food-borne outbreaks or illness secondary to chemical exposure (e.g., pesticides, anhydrous ammonia).

Mailing address:
Bureau of Lead Poisoning Prevention Division of Environmental Health
Iowa Department of Public Health
321 East 12th Street
Des Moines Iowa 50319-0075

Telephone: 1-800-972-2026

Fax: (515)281-4529

Poisoning or Condition	Cases to Report	When to Report	How to Report
Arsenic poisoning	Blood arsenic values equal to or greater than 70 µg/L Urine arsenic values equal to or greater than 100 µg/L of urinary creatinine	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Blood lead testing	All analytical results greater than or equal to 20 micrograms per deciliter (µg/dL) in a child under the age of 6 years or a pregnant woman	Daily	By telephone: 800-972-2026
	All other analytical values for all blood lead analyses	Weekly	Electronic format specified by the department
Cadmium poisoning	Blood cadmium values equal to or greater than 5 µg/L Urine cadmium values equal to or greater than 3 µg/g	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Carbon monoxide (CO) poisoning	Blood carbon monoxide level equal to or greater than 10% carboxyhemoglobin or its equivalent with a breath analyzer test, or a clinical diagnosis of CO poisoning regardless of any test results	Daily	By telephone: 800-972-2026

Poisoning or Condition	Cases to Report	When to Report	How to Report
Hypersensitivity pneumonitis	All cases	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Mercury poisoning	Blood mercury values equal to or greater than 2.8 µg/dL Urine mercury values equal to or greater than 20 µg/L	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Methemoglobinemia	Blood analyses showing greater than 5% of total hemoglobin present as methemoglobin	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Noncommunicable respiratory illness	All cases	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Occupationally related asthma, bronchitis or respiratory hypersensitivity reaction	All cases	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Pesticide poisoning (including pesticide-related contact dermatitis)	All cases	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Severe skin disorder	All cases	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile.
Toxic hepatitis	All cases	Weekly	Format specified by department. Web-based reporting if available. Alternatives include by mail, telephone, and facsimile

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CHAPTER 11
HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION AND ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS)

641—11.1(139A,141A) Definitions. For the purpose of rules 641—11.1(139A,141A) to 641—11.34(915), the following definitions shall apply:

"AIDS" means acquired immune deficiency syndrome as defined by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services.

"AIDS-related condition" means any condition resulting from HIV infection that meets the definition of AIDS as established by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services.

"Blood bank" means a facility for the collection, processing, or storage of human blood or blood derivatives, or from which or by means of which human blood or blood derivatives are distributed or otherwise made available.

"CDC" means the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services.

"CLIA" means Clinical Laboratory Improvement Amendments as administered by the Centers for Medicare and Medicaid Services of the U.S. Department of Health and Human Services.

"Clinical laboratory" means a facility for the microbiological, serological, chemical, hematological, radiobioassay, cytological, immunohematological, pathological or other examination of materials derived from the human body for the purpose of providing information for the diagnosis, prevention, or treatment of any disease or assessment of a medical condition.

"Confirmed positive test" means a reactive result or detectable quantity on any HIV-related test, including an antibody test, an antigen test, a culture, a nucleic acid amplification test, or other test or combination of tests, that is considered to be confirmatory according to prevailing medical technology and algorithms or guidance from CDC. When the confirmed positive test involves more than one test, all test results should be included in any reports to the department.

"Department" means the Iowa department of public health.

"Director of a plasma center, blood bank, clinical laboratory, or public health laboratory" means the person responsible for direction and operation of the facility, the medical director, or the person designated by the director or medical director to ensure compliance with applicable regulations and requirements.

"Emergency medical services personnel" means "emergency medical care provider" as defined in 641—131.1(147A).

"Health care facility" means a health care facility as defined in Iowa Code section 135C.1, an ambulatory surgical center, or a clinic.

"Health care provider" means a person licensed to practice medicine and surgery, osteopathic medicine and surgery, chiropractic, podiatry, nursing, dentistry, or optometry, or licensed as a physician assistant, dental hygienist, or acupuncturist.

"Health facility" means a hospital, health care facility, clinic, blood bank, blood center, sperm bank, laboratory organ transplant center and procurement agency, or other health care institution.

"HIV" means the human immunodeficiency virus identified as the causative agent of AIDS.

"HIV infection" means having acquired the human immunodeficiency virus.

"HIV-related test" means a diagnostic test conducted by a laboratory approved pursuant to CLIA for determining the presence of HIV or antibodies to HIV.

"Laboratory" means a clinical or public health laboratory, a plasma center, or a blood bank inside or outside the boundaries of Iowa.

"Physician" means a person currently licensed pursuant to Iowa Code chapter 148.

"Plasma center" means a facility that conducts plasmapheresis.

"Plasmapheresis" means the removal of blood from a human being to obtain plasma with the subsequent reinfusion of the remaining formed elements into the donor, but excludes such a procedure performed for the purpose of improving the health of the donor.

"Public health laboratory" means a laboratory operated by an agency of city, county or state government for the purpose of supporting disease control activities.

"Sexually transmitted disease or infection" means "sexually transmitted disease or infection" as defined in 641—1.1(139A).

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.2(141A) HIV testing—obtaining consent—voluntary HIV-related tests for adults who are not pregnant.

11.2(1) Prior to conducting a voluntary HIV-related test on an adult, the health care provider requesting the test shall provide information to the subject of the test concerning HIV testing and where to obtain additional information regarding HIV infection and risk reduction.

11.2(2) All adults who are able must give consent for an HIV test, but a separate written consent solely for the purpose of HIV testing shall not be required. If an adult signs a general consent form for the performance of medical tests or procedures, the signing of an additional consent form for the purpose of consenting to an HIV-related test is not required during the time in which the general consent form is in effect. If an adult has not signed a general consent form for the performance of medical tests and procedures, or if the consent form is no longer in effect, a health care provider shall obtain oral or written consent prior to performing the HIV-related test.

11.2(3) If an adult is unable to give consent, the adult's legal guardian may provide oral or written consent. If the adult's legal guardian cannot be located or is unavailable, a health care provider may authorize the HIV-related test when the test results are necessary for diagnostic purposes to provide appropriate urgent medical care.

11.2(4) Once an adult has been informed of a confirmed positive HIV-related test, no HIV-specific consent for medical procedures and tests shall be required for subsequent medical procedures and tests involved in the care or treatment of the adult with HIV infection.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.3(139A,141A) HIV testing—obtaining consent—voluntary HIV-related tests for minors who are not pregnant.

11.3(1) A minor shall have the legal capacity to act and give consent to the provision of medical care or services for the prevention, diagnosis, or treatment of HIV by a hospital, clinic, or health care provider. Consent shall not be subject to later disaffirmance by reason of such minority. The consent of another person, including but not limited to the consent of a spouse, parent, custodian, or guardian, shall not be necessary.

11.3(2) Prior to conducting a voluntary HIV-related test on a minor, the health care provider requesting the test shall provide information to the subject of the test concerning HIV testing and where to obtain additional information regarding HIV infection and risk reduction.

11.3(3) A minor shall be informed prior to testing that, upon confirmation according to prevailing medical technology of a positive HIV-related test result, the minor's legal guardian is required to be informed by the health facility conducting the test. Health facilities where minors are tested shall have available a program to notify the legal guardian of a newly diagnosed minor. The notification process shall emphasize the need for family support and shall assist in making available the resources necessary to accomplish that goal. However, a health facility which is precluded by federal statute, regulation, or CDC guidelines from informing the legal guardian is exempt from the notification requirement.

11.3(4) Prior to the test, a minor shall give written consent for performance of the HIV-related test and to the notification of the legal guardian should the test be confirmed as positive.

11.3(5) If a minor is unable to provide consent for an HIV-related test, the minor's legal guardian may provide oral or written consent for the minor. If the minor's legal guardian cannot be located or is unavailable, a health care provider may authorize the HIV-related test when the test results are necessary for diagnostic purposes to provide appropriate urgent medical care.

11.3(6) Once a minor has been informed of a confirmed positive HIV-related test and the legal guardian has been notified, no HIV-specific consent for medical procedures and tests shall be required for subsequent medical procedures and tests involved in the care or treatment of a minor with HIV infection.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.4(141A) HIV testing—obtaining consent—voluntary HIV-related tests for pregnant women.

11.4(1) All pregnant women, including minors, shall be tested for HIV infection as part of the routine panel of prenatal tests. The health care provider requesting the test shall notify a pregnant woman that HIV screening is recommended for all prenatal patients and that the pregnant woman will receive an HIV test as part of the routine panel of prenatal tests unless the pregnant woman objects to the test. No written or oral consent shall be required.

11.4(2) The testing shall occur as early as possible during each pregnancy.

11.4(3) The health care provider requesting the test shall make information about HIV prevention, risk reduction, and treatment opportunities to reduce the possible transmission of HIV to a fetus available to all pregnant women.

11.4(4) A pregnant woman who is a minor shall be informed prior to testing that, upon confirmation according to prevailing medical technology of a positive HIV-related test result, the minor's legal guardian is required to be informed by the health facility conducting the test. Health facilities where minors are tested shall have available a program to notify the legal guardian of a newly diagnosed minor. The notification process shall emphasize the need for family support and shall assist in making available the resources necessary to accomplish that goal. However, a health facility which is precluded by federal statute, regulation, or CDC guidelines from informing the legal guardian is exempt from the notification requirement.

11.4(5) If a pregnant woman objects to and declines the test, the decision shall be documented in the pregnant woman's medical record by the health care provider. A health care provider shall encourage women who decline the test early in prenatal care to be tested at a subsequent visit.

11.4(6) Once a pregnant woman has been informed of a confirmed positive HIV-related test and, if the pregnant woman is a minor, the legal guardian has been notified, no HIV-specific consent for medical procedures and tests shall be required for subsequent medical procedures and tests involved in the care or treatment of a pregnant woman with HIV infection.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.5(141A) HIV test results—post-test counseling.

11.5(1) At any time that the subject of an HIV-related test is informed of a confirmed positive test result, the health care provider who requested the test or other designated personnel shall initiate counseling concerning the emotional and physical health effects of HIV infection. Particular attention shall be given to explaining the need for the precautions necessary to avoid transmitting the virus. The subject of the test shall be given information concerning where to obtain additional counseling. If a legal guardian of the subject of the test provided consent to the test, the counseling shall be given to the legal guardian.

11.5(2) Post-test counseling requirements do not apply to any of the following:

a. The performance of an HIV-related test by a health care provider or health facility when the health care provider or health facility procures, processes, distributes, or uses a human body part donated for a purpose specified under the revised uniform anatomical gift Act as provided in Iowa Code chapter 142C, or semen provided prior to July 1, 1988, for the purpose of artificial insemination, or donations of blood, and such test is necessary to ensure medical acceptability of such gift or semen for the purposes intended.

b. A person engaged in the business of insurance who is subject to Iowa Code section 505.15.

c. The performance of an HIV-related test by a health care provider or health facility when the subject of the test is deceased and a documented significant exposure has occurred.

d. The performance of an HIV-related test by a health care provider or health facility when the subject of the test is unable to provide consent and the health care provider or health facility provided consent for the subject of the test.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.6(141A) Reporting of diagnoses and HIV-related tests, events, and conditions to the department.

11.6(1) The following constitute reportable events related to HIV infection:

a. A test result indicating HIV infection, including:

(1) Confirmed positive results on any HIV-related test or combination of tests, including antibody tests, antigen tests, cultures, and nucleic acid amplification tests.

(2) A positive result or report of a detectable quantity on any other HIV detection (non-antibody) tests, and results of all viral loads, including nondetectable levels.

b. AIDS and AIDS-related conditions, including all levels of CD4+ T-lymphocyte counts.

c. Birth of an infant to an HIV-infected mother (perinatal exposure) or any (positive, negative, or undetectable) non-antibody detection test (antigen test, viral culture, viral load, or qualitative nucleic acid amplification test) on an infant 18 months of age or younger.

d. Death resulting from an AIDS-related condition, or death of a person with HIV infection.

11.6(2) Within seven days of the receipt of a person's confirmed positive test result indicating HIV infection, the director of a plasma center, blood bank, clinical laboratory or public health laboratory that performed the test or that requested the confirmatory test shall make a report to the department on a form provided by the department.

11.6(3) Within seven days of the receipt of a test result indicating HIV infection, which has been confirmed as positive according to prevailing medical technology, or immediately after the initial examination or treatment of a person infected with HIV, the physician or other health care provider at whose request the test was performed or who performed the initial examination or treatment shall make a report to the department on a form provided by the department.

11.6(4) Within seven days of diagnosing a person as having AIDS or an AIDS-related condition, the diagnosing physician shall make a report to the department on a form provided by the department.

11.6(5) Within seven days of the death of a person with HIV infection, the attending physician shall make a report to the department on a form provided by the department.

11.6(6) Within seven days of the birth of an infant to an HIV-infected mother or a receipt of a laboratory result (positive, negative, or undetectable) of a non-antibody detection test (antigen test, viral culture, viral load, or qualitative nucleic acid amplification test) on an infant 18 months of age or younger, the attending physician shall make a report to the department on a form provided by the department.

11.6(7) The report shall include:

a. The person's name, address, date of birth, gender, race and ethnicity, marital status, and telephone number.

b. The name, address and telephone number of the plasma center, blood bank, clinical laboratory or public health laboratory that performed or requested the test, if a test was performed.

c. The address of the physician or other health care provider who requested the test.

d. If the person is female, whether the person is pregnant.

11.6(8) All persons who experience a reportable event while receiving services in the state, regardless of state of residence, shall be reported.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.7(141A) Penalties.

11.7(1) A director of a plasma center, blood bank, clinical laboratory or public health laboratory or a physician or other health care provider who repeatedly fails to file the report required pursuant to these rules is subject to a report being made to the licensing board governing the professional activities of the individual. The department shall notify the individual each time the department determines that the individual has failed to file a required report. The department shall inform the individual in the

notification that the individual may provide information to the department to explain or dispute the failure to report.

11.7(2) A public, private, or hospital clinical laboratory that repeatedly fails to make the report required under these rules is subject to a civil penalty of not more than $1,000 per occurrence. The department shall not impose the penalty without prior written notice and opportunity for hearing.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.8(141A) Immunity. An individual who makes a report in good faith pursuant to these rules is immune from any liability, civil or criminal, which might otherwise be incurred or imposed as a result of the report.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

Rules 641—11.1(139A,141A) to 641—11.8(141A) are intended to implement Iowa Code sections 139A.35, 141A.4, 141A.6, 141A.7 and 141A.10.

641—11.9 and **11.10** Reserved.

TRAINING PROGRAMS

641—11.11(135) Purpose. The purpose of this rule is to describe the required content of AIDS training programs and to identify the groups of personnel involved.

11.11(1) *Nonemergency personnel.* Within six months of their initial employment, all supervisory and patient care personnel of any agency listed below shall complete a minimum of two hours of training concerning AIDS-related conditions and the prevention of HIV infection:

a. A licensed hospice,

b. A homemaker-home health aide provider agency which receives state homemaker-home health aide funds, or

c. An agency which provides respite care services and receives state funds for respite care services.

11.11(2) *Content.* Training programs must address the following topics:

a. HIV disease processes,

b. Signs and symptoms,

c. Transmission,

d. High-risk activities,

e. Prevention recommendations, and

f. Standard precautions as defined by the CDC and the Occupational Safety and Health Administration of the U.S. Department of Labor.

11.11(3) *Emergency and law enforcement personnel.* All emergency medical services personnel, firefighters, and law enforcement personnel shall complete a minimum of two hours of training concerning AIDS-related conditions and the prevention of HIV infection.

11.11(4) *Content.* Training programs must address the following topics:

a. HIV disease processes,

b. Signs and symptoms,

c. Transmission,

d. High-risk activities,

e. Prevention recommendations, and

f. Standard precautions as defined by the CDC and the Occupational Safety and Health Administration of the U.S. Department of Labor.

This rule is intended to implement Iowa Code section 135.11.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.12 to **11.14** Reserved.

PARTNER NOTIFICATION SERVICES AND DIRECT NOTIFICATION OF AN IDENTIFIABLE THIRD PARTY

641—11.15(139A,141A) Purpose. The purpose of rules 641—11.15(139A,141A) to 641—11.18(141A) is to establish a voluntary partner notification program, including a procedure to allow a physician or the department to notify an identifiable third party of an HIV-infected person directly that the party has been exposed to HIV when the HIV-infected person will not participate in the voluntary partner notification program.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.16(139A,141A) Definitions. For the purpose of rules 641—11.15(139A,141A) to 641—11.18(141A), the following definitions shall apply:

"Identifiable third party" means a sexual partner of or a person who shares drug injecting equipment with a person who has been diagnosed with HIV infection.

"Partner notification" means services provided to a person who has tested positive for a sexually transmitted disease or infection or to the person's sexual or needle-sharing partners or social contacts. These services include, but are not limited to, counseling about the nature of the disease, modes of transmission, and risk reduction techniques; treatment or linkage to medical care and treatment; assessment for and referral to social or medical services; elicitation of exposed partners' names and contact information; testing for other diseases or conditions; and provision of or referral to other prevention services.

"Significant exposure" means "significant exposure" as defined in 641—11.22(139A).
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.17(139A,141A) Partner notification services by the department.

11.17(1) The department shall maintain a partner notification program for persons known to have tested positive for sexually transmitted diseases or infections. In administering the program, the department shall provide for the following:

a. A physician or other health care provider shall encourage a person who tests positive for a sexually transmitted disease or infection to refer for counseling and testing any party with whom the newly diagnosed person has had sexual relations or has shared drug injecting equipment.

b. The physician or other health care provider attending the person who tests positive for a sexually transmitted disease or infection may provide to the department any relevant information provided by the tested person regarding any party with whom the tested person has had sexual relations or has shared drug injecting equipment.

11.17(2) When making contact with partners of a person with a sexually transmitted disease or infection, the department shall not disclose the identity of the person who provided the names of the partners and shall protect the confidentiality of the partners who are contacted.

11.17(3) The department may delegate its partner notification duties under subrule 11.17(1) for persons who have tested positive for HIV infection to a local health authority unless the authority refuses or neglects to conduct the partner notification program in a manner deemed to be effective by the department.

11.17(4) The department may delegate its partner notification duties under subrule 11.17(1) for persons who have tested positive for sexually transmitted diseases other than HIV infection to a local health authority or a physician or other health care provider unless the authority or physician or other health care provider refuses or neglects to conduct the partner notification program in a manner deemed to be effective by the department.

11.17(5) In addition to the provisions for partner notification provided under these rules and notwithstanding any provision to the contrary, a county medical examiner or deputy medical examiner performing official duties pursuant to Iowa Code sections 331.801 through 331.805 or the state medical examiner or deputy medical examiner performing official duties pursuant to Iowa Code chapter 691 who determines through an investigation that a deceased person was infected with HIV may notify

directly, or request that the department notify, the immediate family of the deceased or any person known to have had a significant exposure from the deceased of the finding.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.18(141A) Direct notification of an identifiable third party by a physician or the department.

11.18(1) Direct notification shall be used when an HIV-infected person is having continuing contact with a sexual or needle-sharing partner who is unaware of the person's infection and when both of the following situations exist:

a. A physician for the HIV-infected person is of the good-faith opinion that the nature of the continuing contact through sexual intercourse or the sharing of drug injecting equipment poses an imminent danger of HIV transmission to the third party.

b. When the physician believes in good faith that the HIV-infected person, despite strong encouragement, has not and will not warn the third party and will not participate in the voluntary partner notification program.

11.18(2) The department or a physician may reveal the identity of an HIV-infected person pursuant to this rule only to the extent necessary to protect a third party from the direct threat of transmission. Notification of a person pursuant to this rule shall be made confidentially. Nothing in this rule shall be interpreted to create a duty to warn third parties of the danger of exposure to HIV through contact with an HIV-infected person.

11.18(3) When the physician is of the good-faith opinion and belief that third-party notification should be performed, notification of a person pursuant to this rule shall be made:

a. Directly by the physician in accordance with subrules 11.18(4), 11.18(5) and 11.18(7), or

b. By the department at the request of the physician in accordance with subrules 11.18(6) and 11.18(7).

11.18(4) Notification by the physician. Prior to notification of a third party by an HIV-infected person's physician, the physician shall make reasonable efforts to inform, in writing, the HIV-infected person. The written information shall state that, due to the nature of the person's continuing contact through sexual intercourse or the sharing of drug injecting equipment with the third party and the physician's belief that the HIV-infected person, despite strong encouragement, has not and will not warn the third party and will not participate in the voluntary partner notification program, the physician is forced to take action to provide notification to the third party. The physician, when reasonably possible, shall provide the following information to the HIV-infected person:

a. The nature of the disclosure and the reason for the disclosure.

b. The anticipated date of disclosure.

c. The name of the party or parties to whom disclosure is to be made.

NOTE: Reasonable efforts to inform, in writing, the HIV-infected person shall be deemed satisfied when the physician delivers the written notice in person or directs a written notice to the HIV-infected person's last-known address by restricted certified mail, return receipt requested, at least five days prior to the anticipated date of disclosure to the third party.

11.18(5) When performed by the HIV-infected person's physician, notification of the third party and any disclosure concerning the purpose of that notification shall be made in person. However, initial contact with the third party may be made by telephone, mail, or other electronic means to arrange the meeting with the physician at the earliest opportunity to discuss an important health matter. The nature of the health matter to be discussed shall not be revealed in the telephone call, letter, or other electronic message.

11.18(6) Notification by the department.

a. The physician attending the HIV-infected person shall provide by telephone to the department any relevant information provided by the HIV-infected person regarding any party with whom the HIV-infected person has had sexual relations or has shared drug injecting equipment. The information may include the third party's name, address, telephone number, and any other locating information

known to the physician. The department shall use the information in accordance with procedures established for the voluntary partner notification program.

b. Notification of the third party and any disclosure concerning the purpose of that notification shall be made in person. However, initial contact with the third party may be made by telephone, mail, or other electronic means to arrange the meeting with the department representative. The nature of the matter to be discussed shall not be revealed in the telephone call, letter, or other electronic message.

11.18(7) Confidentiality. The HIV-infected person's physician and the department shall protect the confidentiality of the third party and the HIV-infected person. The identity of the HIV-infected person shall remain confidential unless it is necessary to reveal it to the third party so that the third party may avoid exposure to HIV. If the identity of the HIV-infected person is revealed, the third party shall be presented with a statement in writing at the time of disclosure which includes the following or substantially similar language: "Confidential information revealing the identity of a person infected with HIV has been disclosed to you. The confidentiality of this information is protected by state law. State law prohibits you from making any further disclosure of the information without the specific written consent of the person to whom it pertains. Any breach of the required confidential treatment of this information subjects you to legal action and civil liability for monetary damages. A general authorization for the release of medical or other information is not sufficient for this purpose."

11.18(8) Immunity. A health care provider attending an HIV-infected person has no duty to disclose to or to warn third parties of the dangers of exposure to HIV through contact with the HIV-infected person and is immune from any liability, civil or criminal, for failure to disclose to or warn third parties of the condition of the HIV-infected person.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

Rules 641—11.15(139A,141A) to 641—11.18(141A) are intended to implement Iowa Code sections 139A.33 and 141A.5.

641—11.19 and **11.20** Reserved.

CARE PROVIDERS EXPOSED TO CONTAGIOUS OR INFECTIOUS DISEASES

641—11.21(139A) Purpose. The purpose of these rules is to implement Iowa Code section 139A.19, relating to care providers who are exposed to contagious or infectious diseases.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.22(139A) Definitions. For the purpose of rules 641—11.21(139A) to 641—11.26(139A), the following definitions shall apply:

"AIDS" means acquired immune deficiency syndrome as defined by CDC.

"Blood-borne viral hepatitis" means hepatitis B or hepatitis C.

"Care provider" means an individual who is trained and authorized by federal or state law to provide health care services or services of any kind in the course of the individual's official duties, for compensation or in a voluntary capacity, who is a health care provider, emergency medical care provider as defined in Iowa Code section 147A.1, firefighter, or peace officer. "Care provider" also means an individual who renders emergency care or assistance in an emergency or due to an accident as described in Iowa Code section 613.17.

"CDC" means the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services.

"Certification of a significant exposure report" means the determination by an authorized infection preventionist, occupational health professional, or other personnel trained in infection control or infectious disease medicine and designated by a facility to review significant exposure reports that the incident described by the exposed care provider meets the definition of a significant exposure as defined in this rule.

"Contagious or infectious disease" means blood-borne viral hepatitis, meningococcal disease, AIDS or HIV, tuberculosis, and any other disease determined to be life-threatening to a person exposed to the

disease as established by the department based upon a determination by the state epidemiologist and in accordance with guidelines from CDC.

"Department of corrections" means the Iowa department of corrections.

"Designated representative" means a person who is designated by a department, agency, division, or service organization to act on behalf of the exposed care provider as a liaison with the facility that received the source patient when the exposure occurred in the field or during patient transport.

"Exposure" means a specific eye, mouth, other mucous membrane, nonintact skin, or parenteral contact with blood or other potentially infectious bodily fluids.

"HBV" means hepatitis B virus.

"Health care facility" means a health care facility as defined in Iowa Code section 135C.1, an ambulatory surgical center, or a clinic.

"Health care provider" means a person licensed to practice medicine and surgery, osteopathic medicine and surgery, chiropractic, podiatry, nursing, dentistry, optometry, or as a physician assistant, dental hygienist, or acupuncturist.

"HIV" means the human immunodeficiency virus identified as the causative agent of AIDS.

"Home health services" means health care services provided by a care provider in a patient's home or other residence.

"Infectious bodily fluids" means bodily fluids capable of transmitting HIV as listed in "Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public-Safety Workers," found in Morbidity and Mortality Weekly Report, dated June 23, 1989, Volume 38, Number S-6, published by the U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Atlanta, Georgia 30333, or subsequent CDC statements on this topic. To prevent HIV and blood-borne viral hepatitis disease transmission, this reference indicates that standard precautions should be followed for exposure to the following infectious bodily fluids: blood, amniotic fluid, pericardial fluid, peritoneal fluid, pleural fluid, synovial fluid, cerebrospinal fluid, semen, vaginal secretions, and saliva contaminated with blood. HIV and blood-borne viral hepatitis disease transmission has not occurred from feces, nasal secretions, sputum, sweat, tears, urine, vomitus, and saliva when it is not contaminated with blood.

"Respite care services" means health care services provided by a care provider in a patient's home or other residence on a short-term, temporary basis as relief to those who are caring for family members.

"Significant exposure" means a situation in which there is a risk of contracting disease through exposure to a patient's infectious bodily fluids in a manner capable of transmitting an infectious agent as determined by CDC. Exposure includes contact with blood or other infectious bodily fluids to which standard precautions apply through percutaneous inoculation or contact with an open wound, nonintact skin, or mucous membranes during the performance of normal job duties. Significant exposures include:

1. Transmission of blood, bloody fluids, or other infectious bodily fluids of the source patient onto a mucous membrane (mouth, nose, or eyes) of the care provider.
2. Transmission of blood, bloody fluids, or other infectious bodily fluids of the source patient onto an open wound or lesion with significant breakdown in the skin barrier, including a needle puncture with a needle contaminated with blood, bloody fluids, or other infectious bodily fluids.

"Significant exposure report" means the Report of Exposure to HIV or Other Infectious Disease form provided by the department. This is the only form authorized to be used to document a significant exposure to infectious bodily fluids such that the source patient is deemed to consent to a test to determine if the patient has a contagious or infectious disease, and is deemed to consent to notification of the care provider of the results of the test, pursuant to Iowa Code section 139A.19.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.23(139A,141A) Exposures in non-clinical settings.

11.23(1) If a care provider sustains a significant exposure from a patient while rendering health care or other services, other than home-health or respite care services, outside of a health care facility or hospital, the care provider shall file a significant exposure report as soon as reasonably possible following the exposure. When the exposure occurred outside a clinical setting, a care provider who has sustained

a significant exposure should file this report with the infection control, occupational health, or other designated office of the facility to which the patient was transported.

11.23(2) The source patient to whom the care provider was exposed is deemed to consent to a test to determine if the patient has a contagious or infectious disease and is deemed to consent to notification of the care provider or the designated representative of the results of the test, upon submission of a significant exposure report and certification of the significant exposure by an authorized infection preventionist, occupational health professional, or other professional trained in infectious disease control. No further consent from the source patient is required. However, the source patient shall be notified that an exposure has occurred and shall be told which specific tests are being performed to determine the presence of contagious or infectious diseases. If the source patient is a minor, the minor shall be informed prior to an HIV-related test that, upon positive confirmation of an HIV-related test result, the minor's legal guardian shall be informed of the positive result, pursuant to Iowa Code section 141A.7(3).

11.23(3) Hospitals, clinics, or other health care facilities, institutions administered by the department of corrections, and jails shall have written policies and procedures for reviewing and certifying significant exposure report forms, testing a source patient, and notifying a care provider who sustained a significant exposure while rendering health care services or other services to the source patient when the source patient is delivered to the facility and the exposure occurred prior to the delivery. The policies and procedures shall include the possibility for the care provider to designate a representative to whom notification shall be provided and who shall, in turn, notify the care provider. The identity of the designated representative of the care provider shall not be revealed to the source patient. The designated representative shall inform the hospital, clinic, or other health care facility, institution administered by the department of corrections, or jail of those parties who received the notification and, following receipt of this information and upon request of the source patient, the hospital, clinic, or other health care facility, institution administered by the department of corrections, or jail shall inform the source patient of the parties to whom notification was provided.

11.23(4) The hospital, clinic, or other health care facility to whom the source patient is delivered shall conduct the test. If the source patient is delivered to an institution administered by the department of corrections, the test shall be conducted by the staff physician of the institution. If the source patient is delivered to a jail, the test shall be conducted by the attending physician of the jail or the county medical examiner. If the source patient was deemed to consent upon certification of a significant exposure report, the sample and test results shall only be identified by a number.

11.23(5) If a test result is positive, the hospital, clinic, or other health care facility, or other person performing the test shall notify the source patient and make any required reports to the department pursuant to Iowa Code sections 139A.3 and 141A.6. The report to the department shall include the name of the source patient.

11.23(6) If a source patient is diagnosed or confirmed as having a contagious or infectious disease, the hospital, clinic, or other health care facility, or other person performing the test shall notify the care provider or the designated representative of the care provider who shall then notify the care provider. If the source patient is a minor and is diagnosed with HIV infection, the hospital, clinic, or other health facility, or other person performing the test shall notify the legal guardian of the minor.

11.23(7) The notification shall advise the care provider of possible exposure to a particular contagious or infectious disease and recommend that the provider seek medical attention. The notification shall be provided as soon as reasonably possible following determination that the source patient has a contagious or infectious disease. The notification shall not include the name of the source patient unless the patient consents. If the care provider who sustained a significant exposure determines the identity of a source patient who has been diagnosed or confirmed as having a contagious or infectious disease, the identity of the source patient shall be confidential information and shall not be disclosed by the care provider to any other person unless a specific written release is obtained from the source patient.

11.23(8) This rule does not preclude a hospital, clinic, other health care facility, or a health care provider from providing notification to a care provider under circumstances in which the hospital's,

clinic's, other health care facility's, or health care provider's policy provides for notification of the hospital's, clinic's, other health care facility's, or health care provider's own employees of exposure to a contagious or infectious disease that is not life-threatening if the notice does not reveal a source patient's name, unless the patient consents.

11.23(9) The infection control, occupational health, or other designated office of the facility shall maintain a record of all significant exposure reports it receives and shall retain each report for a period of five years.

11.23(10) The report form "Report of Exposure to HIV or Other Infectious Disease" is a confidential record pursuant to Iowa Code section 141A.9.

11.23(11) The employer of a care provider who sustained a significant exposure shall pay the cost of testing for the source patient and for the testing of the care provider, if the significant exposure was sustained during the course of employment. However, the department shall assist a source patient and an exposed care provider in finding resources to pay for the costs of the testing when a care provider was exposed while rendering direct aid without compensation.

11.23(12) A hospital's, clinic's, other health care facility's, or health care provider's duty to notify under these rules is not continuing. It is limited to the diagnosis of a contagious or infectious disease made in the course of admission, care, and treatment following the rendering of health care services or other services to a patient who was the source of the significant exposure.

11.23(13) Notwithstanding subrule 11.23(12), the hospital, clinic, or other health care facility may notify the exposed care provider if, following discharge from or completion of care or treatment by the hospital, clinic, or other health care facility, the patient who was the source of the significant exposure, and for whom a significant exposure report was submitted that did not result in notification of the exposed care provider, wishes to provide information regarding the source patient's contagious or infectious disease status to the exposed care provider.

11.23(14) Notwithstanding any other provision of law to the contrary, a care provider may transmit cautions regarding contagious or infectious disease information, with the exception of AIDS or HIV pursuant to Iowa Code section 80.9B, in the course of the care provider's duties over the police radio broadcasting system under Iowa Code chapter 693 or any other radio-based communications system if the information transmitted does not personally identify an individual.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.24(139A,141A) Exposures in clinical settings.

11.24(1) If a care provider sustains a significant exposure from a patient while rendering health care services or other services within a hospital, clinic, or other health care facility, or while delivering home-health or respite care services, the care provider shall file a report as soon as reasonably possible following the exposure. A care provider who has sustained a significant exposure should file the report with the infection control, occupational health, or other office designated by the facility in which the exposure occurred, or by the facility which has oversight for the delivery of home-health or respite care services.

a. If a general consent form was signed and in effect at the time of the significant exposure and the source patient is an adult, a significant exposure report form shall not be required to document the significant exposure. The health care facility or hospital may use an employee incident report or other similar form for this purpose. The source patient to whom the care provider was exposed is deemed to consent to a test to determine if the patient has a contagious or infectious disease and is deemed to consent to notification of the care provider or the designated representative of the results of the test, upon submission and review of an employee incident report and certification of the significant exposure by an authorized infection preventionist, occupational health professional, or other professional trained in infectious disease control. No further consent from the source patient is required. However, a source patient shall be notified that an exposure has occurred and shall be told which specific tests are being performed. Prior to conducting an HIV-related test, the health care facility or hospital shall provide information to the source patient concerning testing and a means of obtaining additional information regarding HIV infection and risk reduction pursuant to Iowa Code section 141A.6.

b. If no consent form was signed or in effect at the time of the exposure, or if the source patient is a minor, the source patient is deemed to consent to a test to determine if the patient has a contagious or infectious disease and is deemed to consent to notification of the care provider or the designated representative of the results of the test upon submission of a significant exposure report form and certification of the significant exposure by an authorized infection preventionist, occupational health professional, or other professional trained in infectious disease control. Source patients shall be notified that an exposure has occurred and shall be told which specific tests are being performed to determine the presence of contagious or infectious diseases. If the source patient is a minor, the minor shall be informed prior to an HIV-related test that, upon positive confirmation of an HIV-related test result, the minor's legal guardian shall be informed of the positive result, pursuant to Iowa Code section 141A.7(3).

11.24(2) Hospitals, clinics, or other health care facilities, institutions administered by the department of corrections, and jails shall have written policies and procedures for reviewing and certifying significant exposure report forms or other employee incident report forms, testing a source patient, and notifying a care provider who sustained a significant exposure while rendering health care services or other services to a patient during the admission, care, or treatment of the patient at the facility, or while delivering home-health or respite care services.

11.24(3) The hospital, clinic, or other health care facility where exposure occurred or which has oversight for the delivery of home-health or respite care services shall conduct the test. If a general consent form was signed and in effect and the source patient is an adult, the sample and test results shall be identified by name. If the source patient was deemed to consent to a test and to notification of the care provider upon certification of a significant exposure report pursuant to subrule 11.24(1) because no general consent was signed and in effect at the time of the exposure or because the source patient is a minor, the sample and test results shall be identified only by a number.

11.24(4) If a test result is positive, the hospital, clinic, or other health care facility or other person performing the test shall notify the source patient and make any required reports to the department pursuant to Iowa Code sections 139A.3 and 141A.6. The reports to the department shall include the name of the source patient.

11.24(5) If a source patient is diagnosed or confirmed as having a contagious or infectious disease, the hospital, clinic, or other health care facility or other person performing the test shall notify the care provider or the designated representative of the care provider who shall then notify the care provider. If the source patient is a minor and is diagnosed with HIV infection, the hospital, clinic, or other health care facility or other person performing the test shall notify the legal guardian of the minor.

11.24(6) The notification shall advise the care provider of possible exposure to a particular contagious or infectious disease and recommend that the provider seek medical attention. The notification shall be provided as soon as reasonably possible following determination that the source patient has a contagious or infectious disease.

11.24(7) This rule does not preclude a hospital, clinic, other health care facility, or a health care provider from providing notification to a care provider under circumstances in which the hospital's, clinic's, other health care facility's, or health care provider's policy provides for notification of the hospital's, clinic's, other health care facility's, or health care provider's own employees of exposure to a contagious or infectious disease that is not life-threatening if the notice does not reveal a source patient's name, unless the patient consents.

11.24(8) The infection control, occupational health, or other designated office of the facility shall maintain a record of all significant exposure reports it receives and shall retain each report for a period of five years.

11.24(9) The report form "Report of Exposure to HIV or Other Infectious Disease" is a confidential record pursuant to Iowa Code section 141A.9.

11.24(10) The employer of a care provider who sustained a significant exposure shall pay the cost of testing for the source patient and for the testing of the care provider, if the significant exposure was sustained during the course of employment.

11.24(11) A hospital's, clinic's, other health care facility's, or health care provider's duty to notify under these rules is not continuing. It is limited to the diagnosis of a contagious or infectious disease made in the course of admission, care, and treatment following the rendering of health care services or other services to the patient who was the source of the significant exposure.

11.24(12) Notwithstanding subrule 11.24(11), the hospital, clinic, or other health care facility may notify the exposed care provider if, following discharge from or completion of care or treatment by the hospital, clinic, or other health care facility, the patient who was the source of the significant exposure, and for whom a significant exposure report was submitted that did not result in notification of the exposed care provider, wishes to provide information regarding the source patient's contagious or infectious disease status to the exposed care provider.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.25(139A) Immunity. Hospitals, clinics, health care providers, or other persons participating in good faith in complying with provisions authorized or required under these rules are immune from any liability, civil or criminal, which may otherwise be incurred or imposed.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.26(139A) Duty to test. A hospital, clinic, other health care facility, health care provider, or other person who is authorized to perform a test under these rules has no duty to perform the test authorized.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

Rules 641—11.21(139A) to 641—11.26(139A) are intended to implement Iowa Code section 139A.19.

641—11.27 to **11.29** Reserved.

HIV-RELATED TEST FOR CONVICTED OR ALLEGED SEXUAL-ASSAULT OFFENDERS AND VICTIMS

641—11.30(915) Purpose. The purpose of these rules is to describe procedures to follow for testing of a convicted or alleged offender for HIV pursuant to Iowa Code chapter 915, and to establish procedures to follow for providing counseling, health care, and support services to the victim.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.31(915) Definitions. For the purpose of rules 641—11.30(915) to 641—11.34(915), the following definitions shall apply:

"AIDS" means acquired immune deficiency syndrome as defined by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services.

"Alleged offender" means a person who has been charged with the commission of a sexual assault or a juvenile who has been charged in juvenile court with being a delinquent as a result of actions that would constitute a sexual assault.

"Authorized representative" means an individual who is authorized by the victim to request an HIV-related test of a convicted or alleged offender and who is any of the following:

1. The parent, guardian, or custodian of the victim if the victim is a minor.
2. The physician of the victim.
3. The victim counselor or person requested by the victim who is authorized to provide the counseling regarding the HIV-related test and results.
4. The victim's spouse.
5. The victim's legal counsel.

"Convicted offender" means a person convicted of a sexual assault or a juvenile who has been adjudicated delinquent for an act of sexual assault.

"Department" means the Iowa department of public health.

"Department of corrections" means the Iowa department of corrections.

"Division" means the crime victim assistance division of the office of the attorney general.

"HIV" means the human immunodeficiency virus identified as the causative agent of AIDS.

"HIV-related test" means a diagnostic test conducted by a laboratory approved pursuant to CLIA for determining the presence of HIV or antibodies to HIV.

"Petitioner" means a person who is the victim of a sexual assault which resulted in alleged significant exposure, or the parent, guardian, or custodian of a victim if the victim is a minor, for whom the county attorney files a petition with the district court to require the convicted offender to undergo an HIV-related test.

"Sexual assault" means sexual abuse as defined in Iowa Code section 709.1, or any other sexual offense by which a victim has allegedly had sufficient contact with a convicted or an alleged offender to be deemed a significant exposure.

"Significant exposure" means contact of the victim's ruptured or broken skin or mucous membranes with the blood or bodily fluids, other than tears, saliva, or perspiration, of the convicted or alleged offender. "Significant exposure" is presumed to have occurred when there is a showing that there was penetration of the convicted or alleged offender's penis into the victim's vagina or anus, contact between the mouth and genitalia, or contact between the genitalia of the convicted or alleged offender and the genitalia or anus of the victim.

"Victim" means a petitioner or a person who is the victim of a sexual assault which resulted in significant exposure, or the parent, guardian, or custodian of such a victim if the victim is a minor, for whom the victim or the peace officer files an application for a search warrant to require the alleged offender to undergo an HIV-related test. "Victim" includes an alleged victim.

"Victim counselor" means a person who is engaged by a crime victim center as defined in Iowa Code section 915.20A, who is certified as a counselor by the crime victim center, and who has completed at least 20 hours of training provided by the Iowa coalition against sexual assault or a similar agency.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.32(915) HIV-related test—convicted or alleged sexual assault offender.

11.32(1) Unless a petitioner chooses to be represented by private counsel, the county attorney shall represent the victim's interest in all proceedings under Iowa Code chapter 915.

11.32(2) If a person is convicted of sexual assault or adjudicated delinquent for an act of sexual assault, the county attorney, if requested by the petitioner, shall petition the court for an order requiring the convicted offender to submit to an HIV-related test, provided that all of the following conditions are met:

a. The sexual assault for which the offender was convicted or adjudicated delinquent included sufficient contact between the victim and the convicted offender to be deemed a significant exposure pursuant to 641—11.31(915).

b. The authorized representative of the petitioner, the county attorney, or the court sought to obtain written informed consent to the testing from the convicted offender.

c. Written informed consent was not provided by the convicted offender.

11.32(3) If a person is an alleged offender, the county attorney, if requested by the victim, shall make application to the court for the issuance of a search warrant, in accordance with Iowa Code chapter 808, for the purpose of requiring the alleged offender to submit to an HIV-related test, if all of the following conditions are met:

a. The application states that the victim believes that the sexual assault for which the alleged offender is charged included sufficient contact between the victim and the alleged offender to be deemed a significant exposure pursuant to 641—11.31(915) and states the factual basis for the belief that a significant exposure exists.

b. The authorized representative of the victim, the county attorney, or the court sought to obtain written informed consent to the testing from the alleged offender.

c. Written informed consent was not provided by the alleged offender.

11.32(4) Upon receipt of the petition or application, the court shall:

a. Prior to the scheduling of a hearing, refer the victim for counseling by a victim counselor or a person requested by the victim who is authorized to provide the counseling regarding the nature,

reliability and significance of the HIV-related test and of any test results of the convicted or alleged offender.

b. Schedule a hearing to be held as soon as is practicable.

c. Cause written notice to be served on the convicted or alleged offender who is the subject of the proceeding, in accordance with the Iowa Rules of Civil Procedure relating to the service of original notice, or if the convicted or alleged offender is represented by legal counsel, provide written notice to the convicted or alleged offender and the convicted or alleged offender's legal counsel.

d. Provide for the appointment of legal counsel for a convicted or alleged offender if the convicted or alleged offender desires but is financially unable to employ counsel.

e. Furnish legal counsel with copies of the petition or application, written informed consent, if obtained, and copies of all other documents related to the petition or application, including, but not limited to, the charges and orders.

11.32(5) A hearing under this rule shall be conducted in an informal manner consistent with orderly procedure and in accordance with the Iowa Rules of Evidence.

a. The hearing shall be limited in scope to the review of questions of fact only as to the issue of whether the sexual assault for which the offender was convicted or adjudicated delinquent or for which the alleged offender was charged provided sufficient contact between the victim and the convicted or alleged offender to be deemed a significant exposure, and to questions of law.

b. In determining whether the contact should be deemed a significant exposure for a convicted offender, the court shall base the determination on the testimony presented during the proceedings on the sexual assault charge, the minutes of the testimony or other evidence included in the court record, or if a plea of guilty was entered, based upon the complaint or upon testimony provided during the hearing. In determining whether the contact should be deemed a significant exposure for an alleged offender, the court shall base the determination on the application and the factual basis provided in the application for the belief of the applicant that a significant exposure exists.

c. The victim may testify at the hearing, but shall not be compelled to testify. The court shall not consider the refusal of a victim to testify at the hearing as material to the court's decision regarding issuance of an order or search warrant requiring testing.

d. The hearing shall be in camera unless the convicted or alleged offender and the petitioner or victim agree to a hearing in open court and the court approves. The report of the hearing proceedings shall be sealed and no report of the proceeding shall be released to the public, except with the permission of all parties and the approval of the court.

e. Stenographic notes or electronic or mechanical recording shall be taken of all court hearings unless waived by the parties.

11.32(6) Following the hearing, the court shall require a convicted or alleged offender to undergo an HIV-related test only if the petitioner or victim proves all of the following by a preponderance of evidence.

a. The sexual assault constituted a significant exposure.

b. An authorized representative of the petitioner or victim, the county attorney, or the court sought to obtain written informed consent from the convicted or alleged offender.

c. Written informed consent was not provided by the convicted or alleged offender.

11.32(7) A convicted or alleged offender who is required to undergo an HIV-related test may appeal to the court for review of questions of law only, but may appeal questions of fact if the findings of fact are clearly erroneous.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.33(915) Medical examination costs. The cost of a medical examination for the purpose of gathering evidence and the cost of treatment for the purpose of preventing venereal disease shall be paid from the victim compensation fund as established in Iowa Code chapter 915. Information is available from the department of justice, crime victim assistance program, telephone (515)281-5044.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.34(915) Testing, reporting, and counseling—penalties.

11.34(1) The physician or other practitioner who orders the testing for HIV of a convicted or alleged offender under Iowa Code chapter 915 shall disclose the results of the test to the convicted or alleged offender and to the victim counselor or a person requested by the victim who is authorized to provide the counseling regarding the HIV-related test and results, who shall disclose the results to the petitioner.

11.34(2) Prior to ordering an HIV-related test on a convicted or alleged offender, the physician or practitioner shall provide information to the subject of the test concerning testing and where to obtain additional information on HIV transmission and risk reduction, pursuant to Iowa Code section 141A.6. The department may be contacted for brochures that may assist in meeting the requirements of Iowa Code section 141A.6.

11.34(3) At any time that the subject of an HIV-related test is informed of confirmed positive test results, the physician or other practitioner who ordered the test shall initiate counseling concerning the emotional and physical health effects of HIV infection, as required under Iowa Code section 141A.7, and shall make any required reports to the department pursuant to Iowa Code section 141A.6.

a. The physician or other practitioner shall encourage an HIV-infected person to participate in the voluntary partner notification program pursuant to rule 641—11.17(139A,141A).

b. The physician or other practitioner may provide to the department any relevant information provided by the HIV-infected person regarding any party with whom the HIV-infected person has had sexual relations or has shared drug injecting equipment.

11.34(4) Subsequent testing arising out of the same incident of exposure shall be conducted in accordance with the procedural and confidentiality requirements of 641—11.30(915) to 641—11.34(915).

11.34(5) Results of a test performed under 641—11.30(915) to 641—11.34(915), except as provided in subrule 11.34(6), shall be disclosed only to the physician or other practitioner who ordered the test of the convicted or alleged offender; the convicted or alleged offender; the victim, the victim counselor or person requested by the victim who is authorized to provide the counseling regarding the HIV-related test and results; the physician of the victim if requested by the victim; the parent, guardian, or custodian of the victim, if the victim is a minor; and the county attorney who filed the petition for the HIV-related testing under 641—11.30(915) to 641—11.34(915), who may use the results to file charges of criminal transmission of HIV. Results of a test performed under these rules shall not be disclosed to any other person without the written informed consent of the convicted or alleged offender. A person to whom the results of a test have been disclosed under 641—11.30(915) to 641—11.34(915) is subject to the confidentiality provision of Iowa Code section 141A.9, and shall not disclose the results to another person except as authorized by Iowa Code section 141A.9.

11.34(6) If HIV-related testing is ordered under 641—11.30(915) to 641—11.34(915), the court shall also order periodic testing of the convicted offender during the period of incarceration, probation, or parole or of the alleged offender during a period of six months following the initial test if the physician or other practitioner who ordered the initial test of the convicted or alleged offender certifies that, based upon prevailing scientific opinion regarding the maximum period during which the results of an HIV-related test may be negative for a person after being HIV-infected, additional testing is necessary to determine whether the convicted or alleged offender was HIV-infected at the time the sexual assault or alleged sexual assault was perpetrated. The results of the subsequent periodic tests conducted pursuant to subrule 11.34(6) shall be released only to the physician or other practitioner who ordered the test of the convicted or alleged offender; the convicted or alleged offender; the victim counselor or person requested by the victim to provide the counseling regarding the HIV-related test and results, who shall disclose the results to the petitioner; the physician of the victim if requested by the victim; and the county attorney, who may use the results as evidence in the prosecution of the sexual assault or in the prosecution of the offense of criminal transmission of HIV.

11.34(7) The court shall not consider the disclosure of an alleged offender's serologic status to an alleged victim, prior to conviction, as a basis for a reduced plea or reduced sentence.

11.34(8) The fact that HIV-related tests were performed under 641—11.30(915) to 641—11.34(915) and the results of the tests shall not be included in the convicted offender's medical or criminal record unless otherwise included in department of corrections records.

11.34(9) The fact that HIV-related tests were performed under 641—11.30(915) to 641—11.34(915) and the results of the tests shall not be used as a basis for further prosecution of a convicted offender in relation to the incident which is the subject of the testing, to enhance punishments, or to influence sentencing.

11.34(10) If the serologic status of a convicted offender, which is conveyed to the victim, is based upon an HIV-related test other than a test which is authorized as a result of the procedures established in 641—11.30(915) to 641—11.34(915), legal protections which attach to such testing shall be the same as those which attach to an initial test under 641—11.30(915) to 641—11.34(915), and the rights to a predisclosure hearing and to appeal provided under Iowa Code chapter 915 shall apply.

11.34(11) HIV-related testing required under 641—11.30(915) to 641—11.34(915) shall be conducted by the state hygienic laboratory.

11.34(12) Notwithstanding the provision of these rules requiring initial testing, if a petition is filed with the court under Iowa Code section 915.42 requesting an order for testing and the order is granted, and if a test has previously been performed on the convicted offender while under the control of the department of corrections, the test results shall be provided in lieu of the performance of an initial test of the convicted offender, in accordance with 641—11.30(915) to 641—11.34(915).

11.34(13) Test results shall not be disclosed to a convicted offender who elects against disclosure.

11.34(14) In addition to the counseling received by a victim, referral to appropriate health care and support services shall be provided.

11.34(15) In addition to persons to whom disclosure of the results of a convicted or alleged offender's HIV-related test results is authorized under these rules, the victim may also disclose the results to the victim's spouse, persons with whom the victim has engaged in vaginal, anal, or oral intercourse subsequent to the sexual assault, or members of the victim's family within the third degree of consanguinity.

11.34(16) A person to whom disclosure of a convicted offender's HIV-related test results is authorized under these rules shall not disclose the results to any other person for whom disclosure is not authorized under these rules. A person who intentionally or recklessly makes an unauthorized disclosure in violation of this subrule is subject to a civil penalty of $1,000. The attorney general or the attorney general's designee may maintain a civil action to enforce these rules. Proceedings maintained under this subrule shall provide for the anonymity of the tested subject, and all documentation shall be maintained in a confidential manner.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

Rules 641—11.30(915) to 641—11.34(915) are intended to implement Iowa Code sections 915.40 to 915.43.

641—11.35 to **11.39** Reserved.

AIDS DRUG ASSISTANCE PROGRAM (ADAP)

641—11.40(141A) Definitions. For purposes of rules 641—11.40(141A) to 641—11.49(141A), the following definitions shall apply:

"ADAP advisory committee" means the committee appointed by the bureau of HIV, STD, and hepatitis to provide advice and technical assistance to the department regarding ADAP.

"ADAP formulary" means the list of drugs approved for use in ADAP by the bureau upon recommendation of the ADAP advisory committee.

"AIDS" means acquired immune deficiency syndrome as defined by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services.

"AIDS drug assistance program" or *"ADAP"* means the Iowa AIDS drug assistance program administered by the bureau of HIV, STD, and hepatitis within the department and includes two components, the medication assistance program and the health insurance assistance program.

"Bureau" means the bureau of HIV, STD, and hepatitis within the department.

"Deductible" means an amount of money that an insured person must pay out of pocket before any benefits from the health insurance policy can be used.

"Department" means the Iowa department of public health.

"Director" means the director of the Iowa department of public health.

"Health insurance assistance program" means a component of ADAP that purchases health insurance and pays insurance premiums, copayments for medications, and deductibles for eligible enrollees in ADAP.

"HIV" means the human immunodeficiency virus identified as the causative agent of AIDS.

"Household" means a group of individuals residing together who are related by birth, marriage, or adoption; or an individual who does not reside with any other individual to whom the individual is related by birth, marriage, or adoption.

"Medication assistance program" means a component of ADAP that provides medications directly to eligible enrollees in ADAP.

"Modified adjusted gross income" or *"MAGI"* means the calculation of income based upon applicable Internal Revenue Code and regulations of the Centers for Medicare and Medicaid Services of the U.S. Department of Health and Human Services.

"Payer of last resort" means a requirement to coordinate services and seek payment from all other sources before Ryan White funds are used.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.41(141A) Purpose. The AIDS drug assistance program is a state-administered program that provides certain HIV/AIDS medications to eligible low-income individuals diagnosed with HIV if adequate funding is available for administration of the program. There are two components to the Iowa AIDS drug assistance program: the medication assistance program and the health insurance assistance program. The AIDS drug assistance program is authorized under Part B of Title XXVI of the Public Health Service (PHS) Act, as amended by the Ryan White HIV/AIDS Treatment Extension Act of 2009 (Public Law 111-87). This legislation requires that the Ryan White program, including the AIDS drug assistance program, be the payer of last resort for HIV-related services. ADAP is not an entitlement program and does not create a right to assistance. In the event that funding is exhausted or terminated or there are changes in state or federal guidelines, programs, or regulations that impact funding available to ADAP, the department reserves the right to close enrollment, cease to provide medication assistance or health insurance assistance, or alter eligibility criteria until such time that funding is again sufficient.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.42(141A) Ensuring payer of last resort. To ensure that ADAP is the payer of last resort, the Iowa Medicaid enterprise shall grant the department access to client information for persons enrolled in Medicaid.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.43(141A) Eligibility requirements.

11.43(1) An applicant is eligible to participate in the ADAP medication assistance program if the applicant:

a. Applies for enrollment in ADAP on a form provided by the department;

b. Has no health insurance to cover the cost of the drugs that are or may become available from ADAP;

c. Is currently being prescribed a drug on the ADAP formulary;

d. Has an annual MAGI that is less than or equal to 200 percent of the poverty level as determined by the most recent federal poverty guidelines published annually by the U.S. Department of Health and

Human Services for the size of the household (this income shall be determined after a $500 work-related allowance is deducted from the monthly salary of an employed person with HIV/AIDS);

e. Has a medical diagnosis of HIV infection or AIDS or is an unborn infant or an infant under 18 months of age who has an HIV-infected mother; and

f. Is a resident of Iowa.

11.43(2) An applicant is eligible to participate in the ADAP health insurance assistance program if the applicant:

a. Applies for enrollment in ADAP on a form provided by the department;

b. Has creditable health insurance coverage;

c. Is currently being prescribed a drug on the ADAP formulary;

d. Has an annual MAGI that is less than or equal to 400 percent of the poverty level as determined by the most recent federal poverty guidelines published annually by the U.S. Department of Health and Human Services for the size of the household;

e. Has a medical diagnosis of HIV infection or AIDS or is an unborn infant or an infant under 18 months of age who has an HIV-infected mother; and

f. Is a resident of Iowa.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.44(141A) Enrollment process.

11.44(1) The department shall review each completed application and shall determine enrollment based upon applicant eligibility, the date on which the application was completed, and the availability of funds. When the department determines that an applicant is eligible for enrollment, the applicant may be enrolled for six months commencing with the date of the determination or may be enrolled for a shorter time period at the discretion of the department.

11.44(2) An applicant shall provide the department with all requested information and shall execute any consent forms or releases of information necessary for the department to verify eligibility.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.45(141A) Discontinuation of services.

11.45(1) The department shall review eligibility semiannually after enrollment unless one of the following events occurs within the six-month period to end eligibility:

a. The enrolled individual dies;

b. The enrolled individual is determined eligible and enrolled to fully receive medical services through a third-party payer and is able to fully pay the insurance deductibles and copayments;

c. The enrolled individual's annual MAGI increases to an amount above the respective ADAP component's income guidelines;

d. The enrolled individual establishes residency outside the state of Iowa;

e. The enrolled individual does not request drugs over a 90-day period; or

f. The enrolled individual is placed in an institution such as a nursing home, state prison, or jail for more than 30 days.

11.45(2) An applicant must submit renewal documentation on a semiannual basis, accompanied by all information requested by the department.

[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.46(141A) Distribution requirements.

11.46(1) Enrolled individuals shall be eligible to receive financial assistance only for drugs that:

a. Have received Food and Drug Administration approval to treat HIV or prevent the deterioration of health due to HIV, coinfections, or opportunistic infections; and

b. Are on the ADAP formulary.

11.46(2) The primary care provider shall write each drug prescription for an applicant or enrolled individual.

11.46(3) The enrolled individual must obtain the approved drug from the department's contracted pharmacy unless an exception to this requirement is granted by the department.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.47(141A) ADAP waiting list.

11.47(1) If an applicant is eligible for ADAP and sufficient funds are available to provide services to the applicant, the department shall enroll the applicant. If the applicant is eligible for ADAP and sufficient funds are not available to provide services to the applicant, the department shall place the applicant's name on the ADAP waiting list in the order provided for in this rule.

11.47(2) The department shall place names on the waiting list in chronological order based upon the date of receipt of a completed application by the department.

11.47(3) To verify that applicants on the waiting list continue to meet ADAP eligibility requirements, the department shall require applicants on the waiting list to submit reapplication forms semiannually.

11.47(4) The department shall remove applicants from the waiting list in the chronological order in which their completed applications were approved, provided all updates were received by the department.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.48(141A) Appeals. The department shall cause an applicant to be notified of the department's decision to approve or deny an application or to place an applicant on the ADAP waiting list. In the event an applicant is dissatisfied with the department's decision, the applicant may submit a formal appeal in writing to the ADAP advisory committee. Such request shall be delivered in person or shall be mailed by certified mail, return receipt requested, to ADAP Advisory Committee, Iowa Department of Public Health, Lucas State Office Building, 321 E. 12th Street, Des Moines, Iowa 50319. Upon receipt of such an appeal, the ADAP advisory committee shall review the case and issue a written determination within 15 days of receipt of the request. The decision shall refer to the applicant by initials or other nonidentifying means. The ADAP advisory committee's decision shall be final and binding. This appeal process does not constitute a contested case proceeding as defined in Iowa Code chapter 17A.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

641—11.49(141A) Confidentiality. The ADAP application and all information received or maintained by the department in connection with ADAP shall be considered confidential information in accordance with Iowa Code section 141A.9.
[**ARC 1215C**, IAB 12/11/13, effective 1/15/14]

Rules 641—11.40(141A) to 641—11.49(141A) are intended to implement Iowa Code section 141A.3.

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515-281-7689 www.idph.state.ia.us

The effect of HIPAA privacy provisions on the release of protected health information to the Iowa Department of Public Health

The Iowa Department of Public Health (IDPH), in conjunction with the Attorney General's Office, has completed a comprehensive review of its programs and has determined that neither the agency as a whole, nor any of its programs, are covered entities under HIPAA. However, both the EPSDT Program and Enhanced Services for Maternal Health Program are actually a part of the Medicaid Program of the Iowa Department of Human Services and, as such these programs, will be business associates of the Iowa Department of Human Services and, therefore, subject to many HIPAA provisions. Because IDPH is not a covered entity, many agencies and facilities in Iowa that are covered entities have questioned whether they can continue to disclose the protected health information of their patients or clients to the IDPH as they have in the past. The short answer is YES, such disclosures may continue to occur under HIPAA.

First, HIPAA recognizes that if there is a statute or administrative rule that requires a specific disclosure of protected health information, a covered entity must obey that law. (Section 164.512). Therefore, if there is another federal or state statute or administrative rule which requires a covered entity to disclose protected health information to the IDPH, the covered entity should follow that requirement. Many disclosures of PHI to IDPH are required by state laws, including Iowa Code chapters 135, 136A, 136B, 136C, 139A, 141A, 144, 147A, and 272C and the administrative rules that implement these chapters. These disclosures are legally required and must continue to be made as mandated by state law.

Second, HIPAA allows a covered entity to disclose protected health information to public health authorities for public health activities. (Section 164.512). HIPAA defines a public health authority as "an agency or authority of the United States, a State, a territory, a political subdivision of a State or territory, or an Indian tribe, or a person or entity acting under a grant of authority from or contract with such public agency, including the employees or agents of such public agency or its contractors or persons or entities to whom it has granted authority, that is responsible for public health matters as part of its official mandate." (Section 164.501). The IDPH has such a mandate and, therefore, is a public health authority under HIPAA.

The IDPH, in conjunction with the Iowa Attorney General's Office, has reviewed its programs and determined that protected health information being received by the Department from covered entities in Iowa is disclosed for public health activities. The disclosure of such information to IDPH is, therefore, unaffected by HIPAA and should continue in accordance with past practices. Because IDPH is a public health authority that is authorized to receive PHI under this provision, covered entities are not required to enter into a business associate agreement with IDPH in order for the exchange of protected health information to take place.

Third, in some instances, the IDPH is a health oversight agency as defined by HIPAA. Under HIPAA, a "health oversight agency" is "an agency or authority of the United States, a state, a territory, a political subdivision of a State or territory, or an Indian tribe, or a person or entity acting under a grant of authority from or contract with such public agency, including the employees or agents of such public agency or its contractors or persons or entities to whom it has granted authority, that is authorized by law to oversee the health care system (whether public or private) or government programs in which health information is necessary to determine eligibility or compliance, or to enforce civil rights laws for which health information is relevant."

HIPAA permits a covered entity to disclose protected health information to a health oversight agency for oversight activities authorized by law, including audits; civil, administrative, or criminal investigations; inspections; licensure or disciplinary actions; civil, administrative, or criminal proceedings or actions; or other activities necessary for appropriate oversight of:

1. The health care system *(e.g. State insurance commissions, state health professional licensure agencies, Offices of Inspectors General of federal agencies, the Department of Justice, state Medicaid fraud control units, Defense Criminal Investigative Services, the Pension and Welfare Benefit Administration, the HHS Office for Civil Rights, the FDA, data analysis to detect health care fraud)*;

2. Government benefit programs for which health information is relevant to beneficiary eligibility *(e.g. SSA and Dept. of Education)*;

3. Entities subject to government regulatory programs for which health information is necessary for determining compliance with program standards *(e.g. Occupational Health and Safety Administration and the EPA; the FDS's oversight of food, drugs, biologics, devices, and other products pursuant to the Food, Drug, and Cosmetic Act and the Public Health Service Act)*; or

4. Entities subject to civil rights laws for which health information is necessary for determining compliance *(the U.S. Department of Justice's civil rights enforcement activities, enforcement of the Civil Rights of Institutionalized Persons Act, the Americans with Disabilities Act, the EEOC's civil rights enforcement activities under titles I and V of the ADA)*. (Section 164.512(d)).

"Overseeing the health care system," encompasses activities such as oversight of health care plans, oversight of health benefit plans; oversight of health care providers; oversight of health care and health care delivery; oversight activities that involve resolution of consumer complaints; oversight of pharmaceutical, medical products and devices, and dietary supplements; and a health oversight agency's analysis of trends in health care costs, quality, health care delivery, access to care, and health insurance coverage for health oversight purposes.

Health oversight agencies may provide more than one type of health oversight. Such entities are considered health oversight agencies under the rule for any and all of the health oversight functions that they perform. The disclosure of protected health information to IDPH for these purposes is unaffected by HIPAA and should continue in accordance with past practices.

Finally, local public health departments and local contractors which are covered entities may release protected health information to IDPH under the above-cited legal authority applicable to all covered entities. For example, certain statutes and rules require local public health departments and local

contractors to disclose protected health information to IDPH. Further, as a health oversight agency a local health department is permitted, and in most cases required, to disclose protected health information to IDPH. Disclosures of PHI by local public health departments and local contractors to IDPH do not require business associate agreements and are not prohibited or otherwise affected by HIPAA.

Please call Janet Hoffman, Assistant Attorney General, (515) 281-8330 should you have additional questions regarding these issues.

QUARANTINE

Effective Dates From: _____ Through: _____

Due To Communicable Disease (_____)

No one shall enter or leave these premises without authorization by the Iowa Department of Public Health or the _____County Board of Health. Any individual entering a quarantine premises with or without authorization of the health department or County Board of Health may be isolated or quarantined. Pursuant to Iowa Code section 135.38, any individual who knowingly violates a lawful department order for isolation or quarantine, whether written or oral, shall be guilty of a simple misdemeanor. The court ordered sentence may include a fine up to $500 and imprisonment not to exceed 30 days. No person other than an authorized employee of the Iowa Department of Public Health or county health department shall alter, destroy, or remove this notice. Address inquiries to the Iowa Department of Public Health at 1-800-362-2736.

IOWA CODE 139A.5

Iowa Department of Public Health
321 East 12th Street
Des Moines, IA 50319-0075

Iowa Department of Public Health
Promoting and Protecting the Health of Iowans

Mariannette Miller-Meeks, B.S.N., M.Ed., M.D.
Director

Terry E. Branstad
Governor

Kim Reynolds
Lt. Governor

Facts about Quarantine and Isolation

Quarantine and isolation are public health measures used to prevent or control the spread of communicable diseases which present a risk of serious harm to the public. The Iowa Department of Public Health (Department) and county boards of health (local boards) have the authority to impose quarantine and isolation in very limited circumstances to prevent the spread of certain diseases. Quarantine and isolation are used to protect the public by preventing exposure to infected persons or persons who may be infected.

Here are some facts about quarantine and isolation you should know:

The Department and local boards will impose quarantine or isolation only in the event of an outbreak of a "quarantinable disease," which means a serious and unusual or novel disease such as cholera, diphtheria, measles, infectious tuberculosis, plague, SARS, smallpox, certain viral hemorrhagic fevers, and other diseases spread person to person which present a risk of serious harm to the public's health.

Quarantine means confining a person who has been exposed to a quarantinable disease to see if they become ill and infectious to others. Quarantine is imposed for a period of time equal to the longest incubation period of the disease, which could range from a couple of days to two weeks, depending on the disease.

Isolation means confining a person who is actually infected with a quarantinable disease for the period of time that they are infectious to others, which could range from a couple of days to weeks, depending on the disease.

Prior to imposing quarantine or isolation, the Department and local boards will request that an individual voluntarily confine him or herself to their private home. Only if a person refuses to voluntarily confine themselves will the Department or local boards consider mandatory quarantine or isolation.

The Department and local boards are required by law to impose mandatory quarantine or isolation by the least restrictive means necessary to prevent the spread of the disease. Typically this means the exposed or infected person will be quarantined or isolated in their home.

Only if a person refuses to comply with voluntary home confinement and refuses to comply with quarantine or isolation in their own home will the Department or a local board consider imposing quarantine or isolation to a facility. If a person is quarantined or isolated in a facility the Department or the local board will ensure that the person is confined to a safe and hygienic facility and that they have access to adequate food, medical care, and a means of communication with those outside the facility.

Updated 11/15/12

BEFORE THE IOWA DEPARTMENT OF PUBLIC HEALTH

DIRECTED TO:	)	[**insert case #**]
	)	
[**insert full name and address of subject of order**]	)	**FACILITY ISOLATION ORDER**

The Iowa Department of Public Health (Department) has determined that you have recently developed some symptoms of [**insert name of quarantinable disease (qd)**]. [**insert qd**] is a disease which is spread from person to person and is associated with [**insert symptoms of qd -- fever, cough, respiratory illness, etc.**]. [**insert qd**] presents a risk of serious harm to public health and if it spreads in the community severe public health consequences may result.

The Department has determined that it is necessary to confine your movement to a specific facility to prevent further spread of this disease. The Department has determined that isolation in your home and other less restrictive alternatives are not acceptable because [**insert the reason home isolation is not acceptable (e.g. the person violated a previously issued home isolation order, the person does not have an appropriate home setting conducive to home isolation, etc.)**] The Department is therefore ordering you to comply with the following provisions during the entire period of isolation:

1. **Terms of confinement.** You are ordered to remain at the isolation facility, _____[**insert name and address of facility**], from _____ to _____[**insert dates of isolation**].

2. **Requirements during confinement.** During the period of isolation:

   a. You must not leave the isolation facility at any time unless you have received prior written authorization from the Department to do so.

   b. You must not come into contact with anyone except the following persons:

      (i) other persons who are also under similar isolation order at the isolation facility;
      (ii) authorized healthcare providers and other staff at the isolation facility;
      (iii) authorized Department staff or other persons acting on behalf of the Department; and
      (iv) such other persons as authorized by the Department.

   c. Your daily needs, including food, shelter, and medical care, will be

provided for you during the period of isolation at the isolation facility. You should bring clothing, toiletries, and other personal items with you to the isolation facility. You will have limited access to a telephone at the isolation facility. You may bring your cell phone with you should you desire to have greater access to a means of communication.

d. You should inform your employer that you are under isolation order and are not authorized to physically come to the work place. You should be aware that Iowa law prohibits an employer from firing, demoting, or otherwise discriminating against an employee due to the compliance of an employee with an isolation order issued by the Department. (Iowa Code section 139A.13A).

3. **Information about [qd].** You should review the information contained at Attachment A for information about [**qd**]. You should refer to information provided at the isolation facility to address specific concerns and questions you have about **[qd]**. In order to find out more information about [**qd**] and its symptoms and spread, you may also access the Department=s web-page at www.idph.state.ia.us. If you do not have access to the internet from the isolation facility, you may contact the Department at 1-800-362-2736.

4. **Legal authority.** This order is issued pursuant to the legal authority contained at Iowa Code chapter 139A, [include Iowa Code chapter 135 if a public health disaster exists], and 641 Iowa Administrative Code chapter 1, a copy of which is labeled Attachment B and is attached to this order for your review. The Department shall comply with the principles for quarantine and isolation contained in subrule 1.9(3) of this attachment when issuing and implementing this order.

5. **Ensuring compliance.** In order to ensure that you strictly comply with this Isolation Order the Department or persons authorized by the Department may regularly inspect the isolation facility.

6. **Violations of order.** If you fail to comply with this Isolation Order you may be ordered to be isolated in a more restrictive facility. In addition, failure to comply with this order is a simple misdemeanor for which you may be arrested, fined, and imprisoned.

7. **Your rights -- appeal rights.** While under isolation you have the rights as described in subrule 1.9(8) of Attachment B. In addition, you have the right to appeal this order pursuant to subrule 1.9(7) of Attachment B.

_____ _____

DIRECTOR or MEDICAL DIRECTOR DATE

IOWA DEPARTMENT OF PUBLIC HEALTH
Lucas State Office Building
Des Moines, IA 50319

Attachments to this Order:

Attachment A -- Facts About [**qd**]

Attachment B B 641 Iowa Administrative Code chapter 1

BEFORE THE IOWA DEPARTMENT OF PUBLIC HEALTH

DIRECTED TO:	)	**[insert case #]**
	)	
[insert full name and address of subject of order]	)	)**FACILITY QUARANTINE ORDER**

The Iowa Department of Public Health (Department) has determined that you have had contact with [**insert name of quarantinable disease (qd)**]. [**insert qd**] is a disease which is spread from person to person and is associated with [**insert symptoms of qd -- fever, cough, respiratory illness, etc.**]. [**insert qd**] presents a risk of serious harm to public health and if it spreads in the community severe public health consequences may result.

The Department has determined that it is necessary to quarantine your movement to a specific facility to prevent further spread of this disease. The Department has determined that quarantine in your home and other less restrictive alternatives are not acceptable because [**insert the reason home quarantine is not acceptable (e.g. the person violated a previously issued home quarantine order, the person does not have an appropriate home setting conducive to home quarantine, etc.)**] The Department is therefore ordering you to comply with the following provisions during the entire period of quarantine:

1. **Terms of confinement.** You are ordered to remain at the quarantine facility, _____ [**insert name and address of facility**], from _____ to _____ [**insert dates of quarantine**].

2. **Requirements during confinement.** During the period of quarantine:

   a. You must not leave the quarantine facility at any time unless you have received prior written authorization from the Department to do so.

   b. You must not come into contact with anyone except the following persons:

      (i) other persons who are also under similar quarantine order at the quarantine facility;
      (ii) authorized healthcare providers and other staff at the quarantine facility;
      (iii) authorized Department staff or other persons acting on behalf of the Department; and
      (iv) such other persons as are authorized by the Department.

   c. Your daily needs, including food, shelter, and medical care, will be provided for you during the period of quarantine at the quarantine facility. You should bring clothing, toiletries, and other personal items with you to the quarantine facility. You will have limited access to a telephone at the quarantine facility. You may bring your cell phone with you should you desire to have greater access to a means of

communication.

d. You should inform your employer that you are under quarantine order and are not authorized to physically come to the work place, although you may work from the facility via electronic or other means if appropriate. You should be aware that Iowa law prohibits an employer from firing, demoting, or otherwise discriminating against an employee due to the compliance of an employee with a quarantine order issued by the Department. (Iowa Code section 139A.13A).

3. **Information about [qd].** You should review the information contained at Attachment A for information about [**qd**]. You should refer to information provided at the quarantine facility to address specific concerns and questions you have about **[qd]**. In order to find out more information about [**qd**] and its symptoms and spread, you may also access the Department=s web-page at www.idph.state.ia.us. If you do not have access to the internet from the quarantine facility, you may contact the Department at 1-800-362-2736.

4. **Legal authority.** This order is issued pursuant to the legal authority contained at Iowa Code chapter 139A, [include Iowa Code chapter 135 if a public health disaster exists], and 641 Iowa Administrative Code chapter 1, a copy of which is labeled Attachment B and is attached to this order for your review. The Department shall comply with the principles for quarantine contained in subrule 1.9(3) of this attachment when issuing and implementing this order.

5. **Ensuring compliance.** In order to ensure that you strictly comply with this Quarantine Order the Department or persons authorized by the Department may regularly inspect the quarantine facility.

6. **Violations of order.** If you fail to comply with this Quarantine Order you may be ordered to be quarantined in a more restrictive facility. In addition, failure to comply with this order is a simple misdemeanor for which you may be arrested, fined, and imprisoned.

7. **Your rights -- appeal rights.** While under quarantine you have the rights as described in subrule 1.9(8) of Attachment B. In addition, you have the right to appeal this order pursuant to subrule 1.9(7) of Attachment B.

_____ _____

DIRECTOR or MEDICAL DIRECTOR DATE
IOWA DEPARTMENT OF PUBLIC HEALTH
Lucas State Office Building
Des Moines, IA 50319

Attachments to this Order:

Attachment A -- Facts About [**qd**]

Attachment B B 641 Iowa Administrative Code chapter 1

BEFORE THE IOWA DEPARTMENT OF PUBLIC HEALTH

DIRECTED TO:	)	[***insert case #***]
	)	
[***insert full name and***	)	
address of subject of order]	)	**HOME ISOLATION ORDER**

The Iowa Department of Public Health (Department) has determined that you have recently developed some symptoms of [***insert name of* quarantinable *disease* (qd)**]. [***insert* qd**] is a disease which is spread from person to person and is associated with [***insert symptoms of* qd -- fever, cough, respiratory illness, etc.**]. [***insert* qd**] presents a risk of serious harm to public health and if it spreads in the community severe public health consequences may result.

The Department has determined that home isolation of persons who are known or suspected to have [***insert* qd**] is necessary to prevent further spread of this disease. The Department has determined that isolation in private homes is the least restrictive means necessary to prevent the spread of [***insert* qd**]. The Department is therefore ordering you to remain in your home and to comply with the following provisions during the entire period of isolation:

1. **Terms of confinement.** You are ordered to remain in your home at _____[***insert address***] from _____ to _____[***insert* dates of *isolation***].

2. **Requirements during confinement.** During the period of isolation:

   a. You must not leave your home at any time unless you have received prior written authorization from the Department to do so.

   b. You must remain reachable by telephone at all times and answer and respond fully and truthfully to telephone calls from Department staff and other persons acting on behalf of the Department.

   c. You must not come into contact with anyone except the following persons:

      (i) family members and other persons who reside in your home who are also under Home Isolation Order or Home Quarantine Order;

      (ii) authorized healthcare providers;

      (iii) authorized Department staff or other persons acting on behalf of the Department; and

      (iv) such other persons as are authorized by the Department.

   d. You should arrange by telephone for relatives, neighbors, or friends to assist with any needs you may have during the period of confinement. These persons should not have direct contact with you. If you need assistance in providing for your daily needs, you should call [***insert telephone number***].

e. You must follow the directions contained in the attachment to this order labeled Attachment A to monitor your health status on a daily basis.

f. You will have access to medical care during the period of confinement. If the symptoms you are experiencing become more severe, or if you develop any additional symptoms of [**qd**] detailed in Attachment A, including [***insert* main *symptoms* here**], you should immediately call a public health official at [***insert telephone number***~~]~~. If emergency medical treatment is required for conditions other than those listed in this paragraph (e.g. chest pain or severe accidental injury at home), you should call 911 for an ambulance. When seeking such assistance, you must inform the operator of the 911 line and the ambulance that you are under Home Isolation Order.

g. If other persons also reside in your home you must maintain good personal hygiene at all times, ~~i~~including complying with the directions contained in Attachment A, to prevent disease transmission. If any member of your household develops any symptoms of [**qd**] detailed in Attachment A, such person should immediately call a public health official at [**insert telephone number**].

h. You should inform your employer that you are under home isolation and are not authorized to physically come to the work place. You should be aware that Iowa law prohibits an employer from firing, demoting, or otherwise discriminating against an employee due to the compliance of an employee with an isolation order issued by the Department. (Iowa Code section 139A.13A).

3. **Information about** [**qd**]**.** You should review the information contained at Attachment A for information about [**qd**]. In order to find out more information about [**qd**] and its symptoms and spread, you may access the Departments web-page at www.idph.state.ia.us. If you do not have access to the internet from your home, you may contact the Department at 800.362.2736 for more information about this disease.

4. **Legal authority.** This order is issued pursuant to the legal authority contained at Iowa Code chapter 139A, [*include Iowa Code chapter 135 if a public health disaster exists*], and 641 Iowa Administrative Code chapter 1, a copy of which is labeled Attachment B and is attached to this order for your review. The Department shall comply with the principles for isolation and quarantine contained in subrule 1.9(3) of this attachment when issuing and implementing this order.

5. **Ensuring compliance.** In order to ensure that you strictly comply with this Home Isolation Order the Department or persons authorized by the Department may contact you by telephone on a regular basis and may carry out spot checks of your residence.

6. **Violations of order.** If you fail to comply with this Home Isolation Order you may be ordered to be isolated in a hospital or other facility as determined by the Department. In addition, failure to comply with this order is a simple misdemeanor for which you may be arrested, fined, and imprisoned.

7. **Your rights – appeal rights.** While under isolation you have the rights as described in subrule 1.9(8) of Attachment B. In addition, you have the right to appeal this order pursuant to subrule 1.9(7) of Attachment B.

_____ _____

DIRECTOR or MEDICAL DIRECTOR DATE
IOWA DEPARTMENT OF PUBLIC HEALTH
Lucas State Office Building
Des Moines, IA 50319

Attachments to this Order:

Attachment A -- Facts About [***insert disease name***]
Attachment B -- 641 Iowa Administrative Code chapter 1

BEFORE THE IOWA DEPARTMENT OF PUBLIC HEALTH

DIRECTED TO:	)	**[insert case #]**
	)	
[insert full name and address of subject of order]	)	**HOME QUARANTINE ORDER**

The Iowa Department of Public Health (Department) has determined that you have had contact with [**insert name of quarantinable disease (qd)**]. [**insert qd**] is a disease which is spread from person to person and is associated with [**insert symptoms of (e.g. fever, cough, respiratory illness, etc.)**]. [**Insert qd**] presents a risk of serious harm to public health and if it spreads in the community severe public health consequences may result.

The Department has determined that home quarantine of persons who have been exposed to [**insert qd**] is necessary to prevent further spread of this disease. The Department has determined that quarantine in private homes is the least restrictive means necessary to prevent the spread of [**insert qd**]. The Department is therefore ordering you to remain in your home and to comply with the following provisions during the entire period of quarantine:

1. **Terms of confinement.** You are ordered to remain in your home at _____[**insert address**] from _____ to _____[**insert dates of quarantine**].

2. **Requirements during confinement.** During the period of quarantine:

   a. You must not leave your home at any time unless you have received prior written authorization from the Department to do so.

   b. You must remain reachable by telephone at all times and answer and respond fully and truthfully to telephone calls from Department staff and other persons acting on behalf of the Department.

   c. You must not come into contact with anyone except the following persons:

      (i) family members and other persons who reside in your home;
      (ii) authorized healthcare providers;
      (iii) authorized Department staff or other persons acting on behalf of the Department; and
      (iv) such other persons as are authorized by the Department.

   d. If family members or other persons who reside in your home have not been issued a Home Quarantine Order, they may leave your home to carry on their daily routines and to assist you with any needs you may have during the period of confinement. If you live alone, or if every member of your household is under Home Quarantine Order, you should arrange by telephone for relatives, neighbors, or friends to assist with any needs you may have during the period of confinement. These persons should not have direct contact with you. If you need assistance in

providing for your daily needs, you should call [**insert telephone number**]

e. You must follow the directions contained in the attachment to this order labeled Attachment A to monitor your health status on a daily basis.

f. If you develop any symptoms of [**qd**] detailed in Attachment A, including [**insert main symptoms here**], you should immediately call a public health official at [**insert telephone number**]. If emergency medical treatment is required for conditions other than those listed in this paragraph (e.g. chest pain or severe accidental injury at home), you should call 911 for an ambulance. When seeking such assistance, you must inform the operator of the 911 line and the ambulance that you are under Home Quarantine Order.

g. If other persons also reside in your home you must maintain good personal hygiene at all times, including complying with the directions contained in Attachment A, to prevent disease transmission. If any member of your household develops any symptoms of [**qd**] detailed in Attachment A, such person should immediately call a public health official at [**insert telephone number**].

h. You should inform your employer that you are under home quarantine and are not authorized to physically come to the work place, although you may work from home via electronic or other means if appropriate. You should be aware that Iowa law prohibits an employer from firing, demoting, or otherwise discriminating against an employee due to the employee's compliance with a quarantine order issued by the Department. (Iowa Code section 139A.13A).

3. **Information about [qd].** You should review the information contained at Attachment A for information about **[qd]**. In order to find out more information about [**qd**] and its symptoms and spread, you may access the Department=s web-page at www.idph.state.ia.us. If you do not have access to the internet from your home, you may contact the Department at 1-800-362-2736.

4. **Legal authority.** This order is issued pursuant to the legal authority contained at Iowa Code chapter 139A, [include Iowa Code chapter 135 if a public health disaster exists], and 641 Iowa Administrative Code chapter 1, a copy of which is labeled Attachment B and is attached to this order for your review. The Department shall comply with the principles for quarantine contained in subrule 1.9(3) of this attachment when issuing and implementing this order.

5. **Ensuring compliance.** In order to ensure that you strictly comply with this Home Quarantine Order the Department or persons authorized by the Department may contact you by telephone on a regular basis and may carry out spot checks of your residence.

6. **Violations of order.** If you fail to comply with this Home Quarantine Order you may be ordered to be quarantined in a hospital or other facility as determined by the Department. In addition, failure to comply with this order is a simple misdemeanor for which you may be arrested, fined, and imprisoned.

7. **Your rights -- appeal rights.** While under quarantine you have the rights as described in subrule 1.9(8) of Attachment B. In addition, you have the right to appeal this order pursuant to subrule 1.9(7) of Attachment B.

_____ _____

DIRECTOR or MEDICAL DIRECTOR DATE
IOWA DEPARTMENT OF PUBLIC HEALTH
Lucas State Office Building
Des Moines, IA 50319

Attachments to this Order:

Attachment A -- Facts About [**qd**]
Attachment B -- 641 Iowa Administrative Code chapter 1

Contact Information

Iowa Department of Public Health
Lucas State Office Building
321 E. 12th Street
Des Moines, IA 50319-0075
Main Number: 515-281-7689

Center for Acute Disease Epidemiology (CADE)	**Lucas State Office Building 321 E. 12th Street Des Moines, IA 50319-0075**	**Main Number: 515-242-5935 Fax: 515-281-5698**

The center works to protect and preserve the health and safety of Iowans from infectious diseases through disease surveillance; investigation of acute outbreaks; institution of interventions to prevent ongoing spread of disease, education and consultation to county, local, and private health agencies on infectious diseases; immunization and vaccine guidelines; treatment after animal bites; and vaccines for international travel.

The center also provides consultation to county and local health agencies on diseases requiring public health intervention, collaborates with Centers for Disease Control and Prevention by weekly reporting of nationally reportable diseases, and offers health education opportunities through lectures and organizational seminars.

Disease Reporting Number (24/7)	**800-362-2736**
Iowa State Patrol	**515-323-4360**

Bureau of Immunization and TB	**Lucas State Office Building 321 E. 12th Street Des Moines, IA 50319-0075**	**Main Number: 515-281-5424**

The Bureau of Immunization and Tuberculosis works to protect the health of Iowans from vaccine preventable diseases and tuberculosis with the goal of reducing and ultimately eliminating the incidence of these diseases. The Bureau conducts surveillance and prevention activities in conjunction with public and private healthcare providers. Surveillance activities include disease monitoring and reporting, laboratory testing, disease investigation and rapid institution of disease control measures including isolation and quarantine. Bureau prevention and treatment activities include targeted disease testing, vaccination programs, dispensing medications, healthcare provider consultation and education.

Immunization	**800-831-6293**
Refugee Health	**515-281-7504**
Tuberculosis	**515-281-7504**

Bureau of HIV, STD and Hepatitis	**Lucas State Office Building 321 E. 12th Street Des Moines, IA 50319-0075**	**Main Number 515-281-6801**

Prevention and care services target *Chlamydia*, syphilis, gonorrhea, HIV/AIDS, and hepatitis B and C. Staff from the Sexually Transmitted Disease, HIV/AIDS, and Adult Viral Hepatitis Prevention Programs partner with local public health departments, private health care agencies, regional disease prevention specialists, and community-based organizations to interrupt the disease transmission process and provide access to testing, treatment, immunizations, and prevention programs.

STD	**515-281-3031**

HIV/AIDS	**515-242-5141**
Hepatitis B – Perinatal	**515-281-7228**
Hepatitis B – Other	**515-242-5935**
Hepatitis C	**515-281-5027**

Bureau of Environmental Health Services	**Lucas State Office Building 321 E. 12th Street Des Moines, IA 50319-0075**	**Main Number: 515-281-7726**

The Bureau of Environmental Health Services is actively engaged in work related to hazardous spills, evaluation of waste sites, healthy homes, emergency preparedness, Grade A milk inspection, swimming pool and spa safety, water fluoridation, food safety, Grants-to-Counties, healthy homes and several other areas of environmental health practice. Bureau staff also acts as a resource for new county environmental health professionals, and are available to local board of health members to provide education about the everyday impact of environmental health practice.

Bureau of Lead Poisoning Prevention	**Lucas State Office Building 321 E. 12th Street Des Moines, IA 50319-0075**	**Main Number: 800-972-2026**

The Bureau of Lead Poisoning Prevention oversees programs related to occupational health and safety, work-related fatal injuries, pesticide poisoning surveillance, and the prevention of lead poisoning. The occupational health and safety surveillance program tracks standard occupational health. The work-related fatal injuries program investigates work-related fatal injuries and disseminates information about how to prevent work-related fatalities. The pesticide poisoning surveillance program collects information on all exposures of Iowans to pesticides. The lead poisoning prevention activities include the collection of the results of all blood lead testing done on Iowans of all ages. The Bureau implements the requirement that all Iowa children be tested for lead poisoning, works with local childhood lead poisoning prevention programs to follow up on cases of childhood lead poisoning, and follows up on cases of adult lead poisoning. Finally, the Bureau implements programs that require those who conduct renovation, lead abatement, and lead inspections to be certified and requires the owners and occupants of housing and child-occupied facilities be notified when paint is disturbed in these buildings.

Bureau of Radiological Health	**Lucas State Office Building 321 E. 12th Street Des Moines, IA 50319-0075**	**Main Number: 515-281-3478**

The Bureau of Radiological Health programs protect Iowans from unnecessary exposure to radiation. Each year, Iowans are exposed to an average of 300 millirem of naturally occurring radiation and 60 millirem of manmade radiation. The Bureau functions under legislative mandates per Iowa Code, Chapters 136B, C and D.

Bureau of Family Health	**Lucas State Office Building 321 E. 12th Street Des Moines, IA 50319-0075**	**Main Number: 800-383-3826 or 515-281-3826**

The Bureau of Family Health guides the development of preventive health services for Iowa families in partnership with families, communities, health care providers and public health providers. Programs promote development of local systems of health care to assure that all women have access to reproductive health services and all Iowa children receive regular, preventive health care. Programs support family centered, community based and culturally sensitive health services for all Iowa families. The toll free *Healthy Families* line (800-369-2229), a 24-hour information and referral service, promotes access to community-based health resources.

Child Care Resources and Referral Services	**www.iowaccrr.org to locate the phone number for local/regional CCRR personnel**

Other Important Phone Numbers

University of Iowa State Hygienic Laboratory	**102 Oakdale Campus Iowa City, IA 52242-5002**	**Main Number: 319-335-4500**

As a state agency under the Iowa Board of Regents, within the Health Sciences Center of The University of Iowa, the State Hygienic Laboratory (SHL) provides multidisciplinary analytical and diagnostic scientific services, leadership and education to support environmental quality and public health. The Laboratory provides services for assessment, surveillance, research and development, and technology transfer in support of public policy and its development on a state, national and international level.

The Laboratory's Statement of Mission is derived from, and consistent with, its responsibilities as specified in the Code of Iowa under Chapter 263.7-8. (Rules implementing this statute and governing the operation of the Laboratory are found in the Iowa Administrative Code, Sections 720-5.1 through 720-5.3.) The Mission of the SHL has been affirmed by the Iowa Supreme Court.

Iowa Department of Agriculture and Land Stewardship	**Wallace State Office Building 502 E. 9th St. Des Moines, Iowa 50319**	**Main Number: 515-281-5321**

Iowa Department of Agriculture and Land Stewardship (IDALS) works to build a department of agriculture that can respond quickly and efficiently to changing global conditions in agriculture. The department wants to increase Iowa's agricultural market share -- both domestic and foreign, and assist in the removal of unnecessary barriers to agricultural trade. They work to develop and encourage agricultural education and new avenues for Iowa producers to market their products, increasing the independent farmer's impact on the market. IDALS adds value in Iowa to agriculture by developing new products and creating links for Iowa farmers with consumer-ready markets. The fight to preserve Iowa's precious soil, and improve water quality to ensure opportunities for future generations of Iowans and protect consumers and producers by assuring the quality of Iowa agricultural products and animal health.

Iowa Department of Natural Resources (DNR)	**Wallace State Office Building 502 E. 9th St. Des Moines, Iowa 50319**	**Main Number: 515-281-5918**

The Iowa Department of Natural Resources is the government agency that leads Iowans in caring for their natural resources. It is responsible for maintaining state parks and forests, protecting the environment, and managing energy, fish, wildlife, and land and water resources in Iowa.

Iowa State University – Entomology Department	**Entomology Department Rm 442, Science II Building Iowa State University Ames, Iowa 50011-3222**	**Main Number(s): 515-294-4387**

Entomologists at Iowa State university have engaged in teaching, research, and extension for more than a century. Professor Herbert Osborn taught the nation's first entomology course in 1880, beginning a tradition of excellence in basic and applied entomology. The Department of Entomology faculty work to provide education, develop innovative research programs and supply a creative, highly visible problem-solving extension program.

Iowa State University Veterinary Diagnostic Laboratory	**Iowa State University College of Veterinary Medicine 1600 South 16th St. Ames, IA 50011**	**Main Number: 515-294-1950 After Hours: 515-290-1969 Fax: 515-294-3564**

The Iowa State University Veterinary Diagnostic Laboratory (VDL) is accredited as a full service laboratory by the American Association of Veterinary Laboratory Diagnosticians (AAVLD).

Iowa Department of Inspections and Appeals	**Lucas State Office Building 321 E. 12th St. Des Moines, Iowa 50319-0075**	**Main Number: 515-281-7102**

The Department of Inspections and Appeals (DIA) is a multifaceted regulatory agency charged with protecting the health, safety and well being of Iowans. The agency is responsible for inspecting, licensing and/or certifying health care providers and suppliers, restaurants and grocery stores, social and charitable gambling operations, hotels and motels, and barber and beauty shops. In addition, DIA staff investigates alleged fraud in the State's public assistance programs and conducts contested case hearings to settle disputes between Iowans and various state government agencies.

The Department was created in 1986 to coordinate and conduct various audits, appeals, hearings, inspections, and investigations related to the operations of the executive branch of state government. DIA is organized into four major divisions, each with its own specific duties and responsibilities. Overseeing the daily operation of the agency is the Administration Division, which includes the Director's Office and staff. The Director's Office sets policy for the Department and is responsible for coordinating DIA's various programs and functions.

Iowa Statewide Poison Control Center	**St. Luke's Regional Medical Center 401 Douglas St, Suite 402 Sioux City, IA 51101**	**Main Number(s): 800-222-1222 (712) 277-2222**

The Iowa Statewide Poison Control Center (ISPCC) was formed in 2000 by combining the poison control resources and expertise of Iowa Health System and University of Iowa Hospitals and Clinics. The IHS and the UIHC each have a 25-year history of providing poison control services throughout the state.

The jointly sponsored statewide poison control center provides all of Iowa's 2.9 million citizens 24-hour toll-free telephone access to emergency poison information and treatment.

Specially trained nurses staff the ISPCC's hotline 24 hours a day and are backed-up by a physician toxicologist. These poison specialists answer questions about household products, drug overdoses, chemicals at work or in the environment, plant and mushroom ingestions, medication errors, bites and stings, or any other toxicology-related subject.

Clearinghouse	**Main Number: 319-398-5133**

Website:
healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295
Materials on reportable diseases are free of charge and may be obtained by contacting the clearinghouse. These materials are provided to local public health agencies and relevant partners. Among the materials available is disease reporting forms, disease brochures, and disease posters. The recommended way of ordering is by using the clearinghouse website.

Iowa Department of Public Health — Bureau of HIV, STD, and Hepatitis

Disease Prevention Specialist Regions

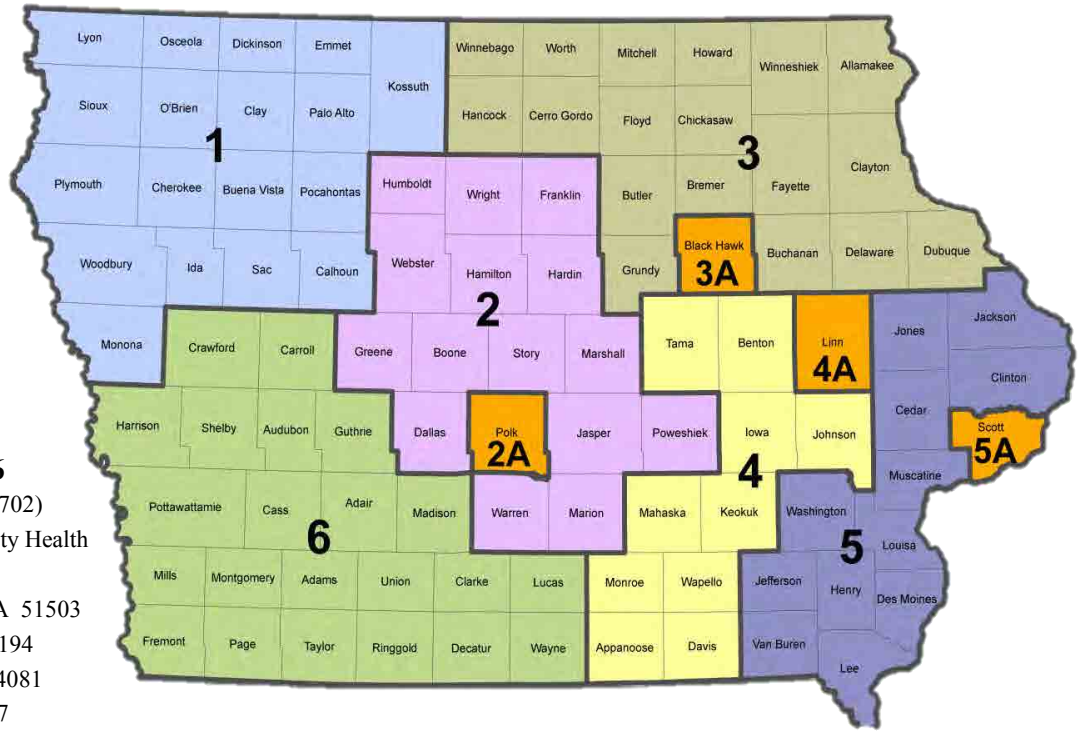
Region 1
Jodie Liebe (708)
Siouxland District Health Dept
1014 Nebraska St
Sioux City IA 51105
Office 712-234-3926
Mobile 515-783-4076
Fax 712-234-3920
jodie.liebe@idph.iowa.gov

Region 2
LaShaina Woods (706)
Iowa Dept of Public Health
Lucas State Office Building
321 E 12th 5th Fl
Des Moines IA 50319
Office 515-281-6087
Mobile 515-783-4077
Fax 515-281-0466
lashaina.woods@idph.iowa.gov

Region 2A Polk Co.
*Kari Lebeda Townsend (749)
*Beth Dooley (732)
*Jaimie Schwab (735)
*Kate Gilmore (738)
*Jean Phillips (740)
Polk County Health Dept
1907 Carpenter
Des Moines IA 50314
Phone 515-286-3798
Fax 515-286-2033

Region 3
Gina Mallett (704)
Black Hawk County Health Dept
1407 Independence Ave 5th Fl
Waterloo IA 50703
Office 319-292-2235
Mobile 515-783-4086
Fax 319-291-2529
gina.mallett@idph.iowa.gov

Region 3A Black Hawk Co.
*Carla Bergmeier (703)
*Brenda Hostetler (715)
*Ange Miller (751)
*Claudia Robinson (754)
Black Hawk County Health Dept
1407 Independence Ave 5th Fl
Waterloo IA 50703
Phone 319-292-2413
Fax 319-291-2529



Region 4
Shannon Wood (746)
Johnson County Public Health
855 S Dubuque St
Iowa City IA 52240
Office 319-358-1834
Mobile 515-783-4079
Fax 319-356-6039
shannon.wood@idph.iowa.gov

Region 4A Linn Co.
*Barbara Chadwick (761)
*Carissa Griffin (724)
*Sherri Schuchmann (729)
*Heather Meador (747)
Linn County Public Health
501 13th St NW
Cedar Rapids IA 52405
Phone 319-892-6000
Fax 319-892-6098

Region 5
Mary Costello (710)
Scott County Health Dept
600 W 4th St 4th Fl
Davenport IA 52801
Office 563-326-8216
Mobile 515-783-4078
Fax - 563-326-8774
mary.costello@idph.iowa.gov

Region 5A Scott Co.
*Roma Taylor (719)
*Stuart Scott (707)
*Lashon Moore (736)
*Jane Morehouse (739)
Scott County Health Dept
600 W 4th St 4th Fl
Davenport IA 52801
Phone 563-326-8618
Fax 563-326-8774

Region 6
Linda McQuinn (702)
Council Bluffs City Health
209 Pearl St
Council Bluffs IA 51503
Office 712-328-3194
Mobile 515-783-4081
Fax 712-328-4917
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***County Employee**

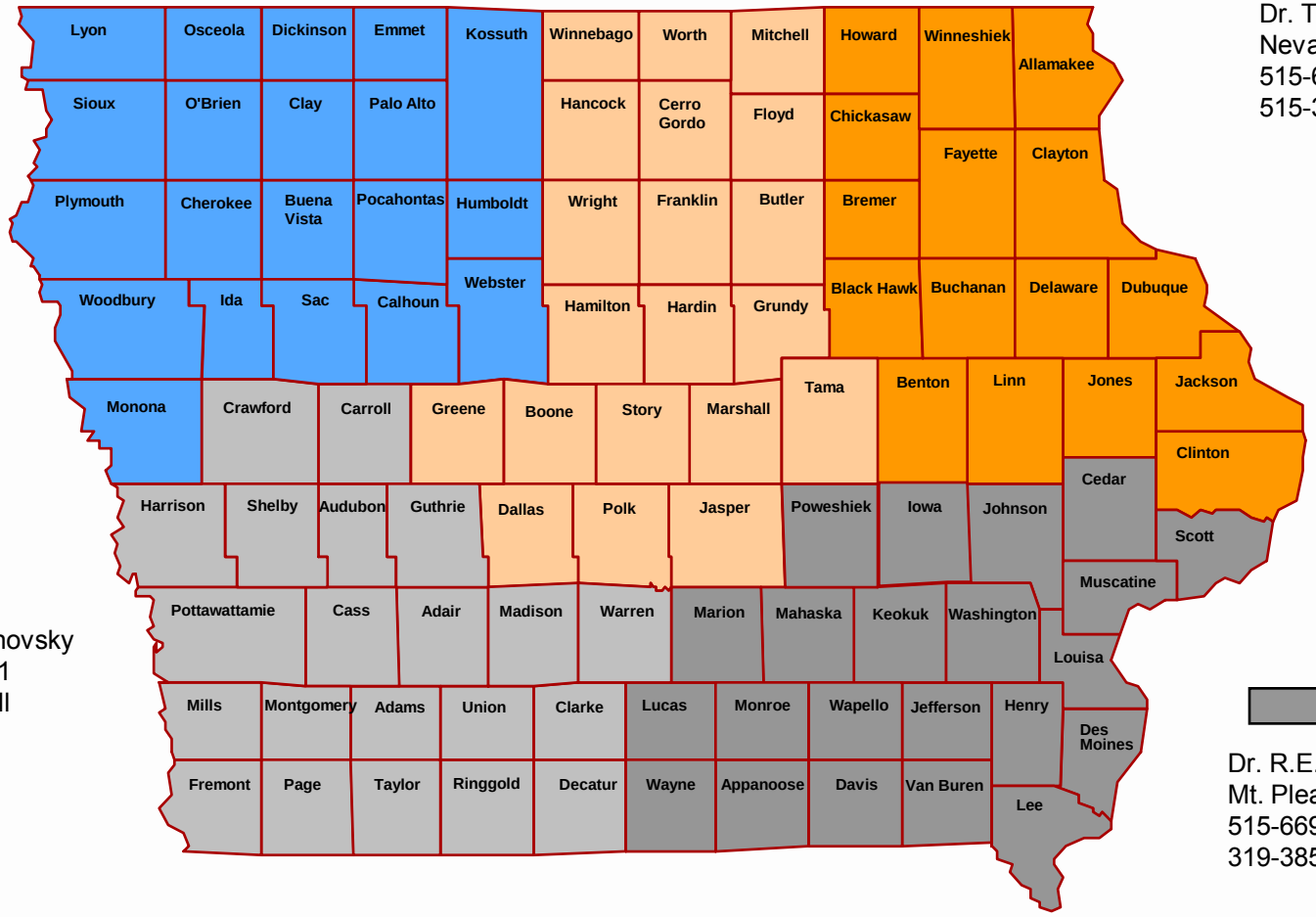
REVISED OCT. 2013

STATE VETERINARIAN DISTRICTS

Dr. David Schmitt, State Veterinarian
515-281-8601 * 515-669-3527 cell

Dr. Greg Schmitt
Le Mars IA 51031
515-669-5633 cell
712-541-6033 fax

Dr. Tim Smith
Nevada, IA 50201
515-669-6231 cell
515-382-4270 fax



Dr. Gary E. Eiben
Colesburg, IA 52035
515-669-6095 cell
563-856-3009 fax

Dr. Wayne Rychnovsky
Corning, IA 50841
515-971-7391 cell

Dr. R.E. Welander
Mt. Pleasant, IA 52641
515-669-5929 cell
319-385-7000 fax

Assistant State Veterinarian
515-281-0866 – office

March 2013

March 2013

Bureau of Local Public Health Services

Iowa Department of Public Health – Division of Health Promotion and Chronic Disease Prevention

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VACANT, RCHC

Cell:

Email:

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Fax: (641) 634-2097
Berdette.Ogden@idph.iowa.gov

Diane M. Anderson, PP2
Office: (515) 242-6522
Fax: (515) 242-6384

Diane.M.Anderson@idph.iowa.gov

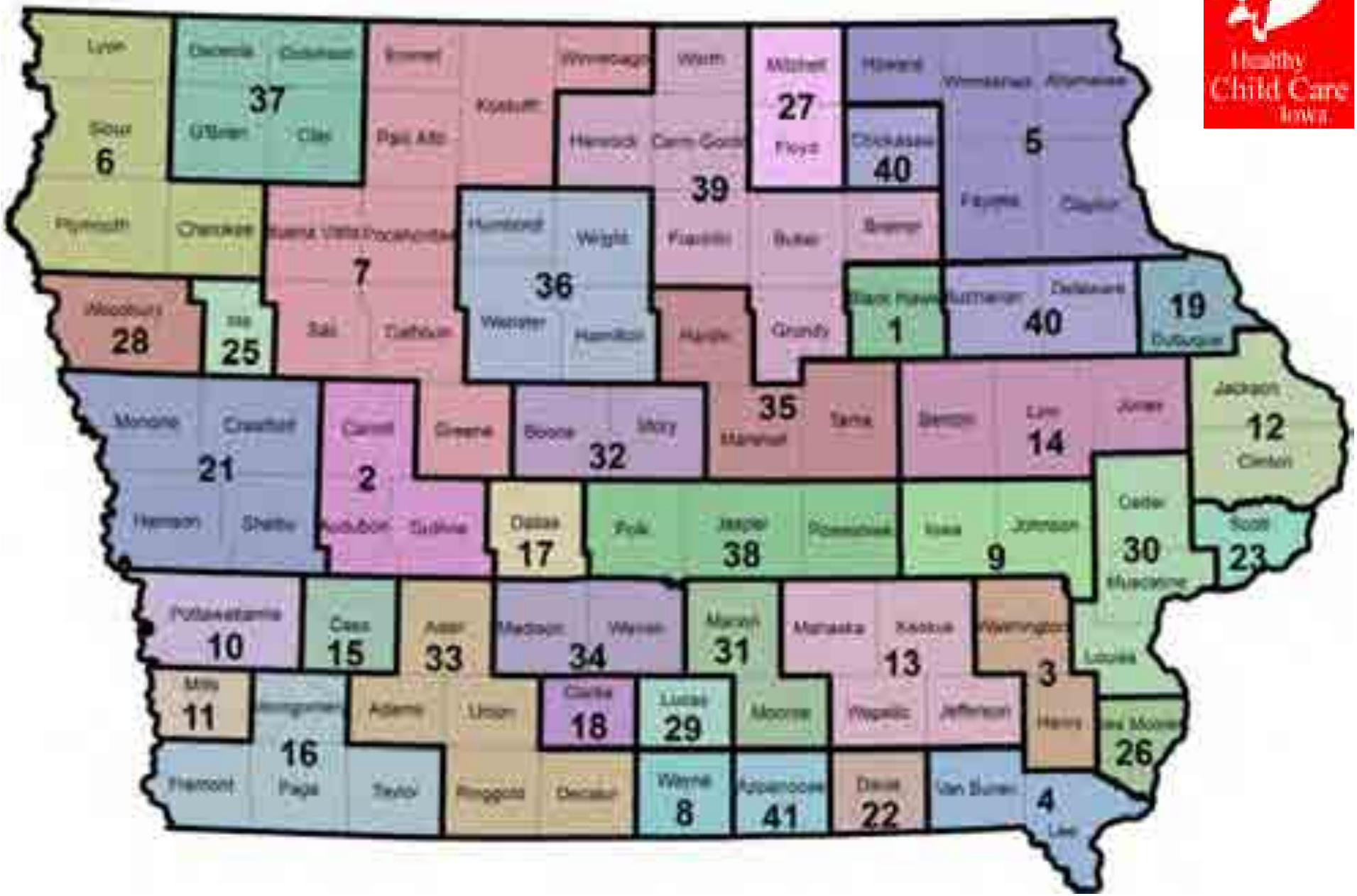
Gerd Clabaugh, Division Director
Gerd.Clabaugh@idph.iowa.gov
Office: (515) 281-7996

RCHC = Regional Community Health Consultant

PP2 = Program Planner 2

Revised 9/23/13

Healthy Child Care Iowa Map

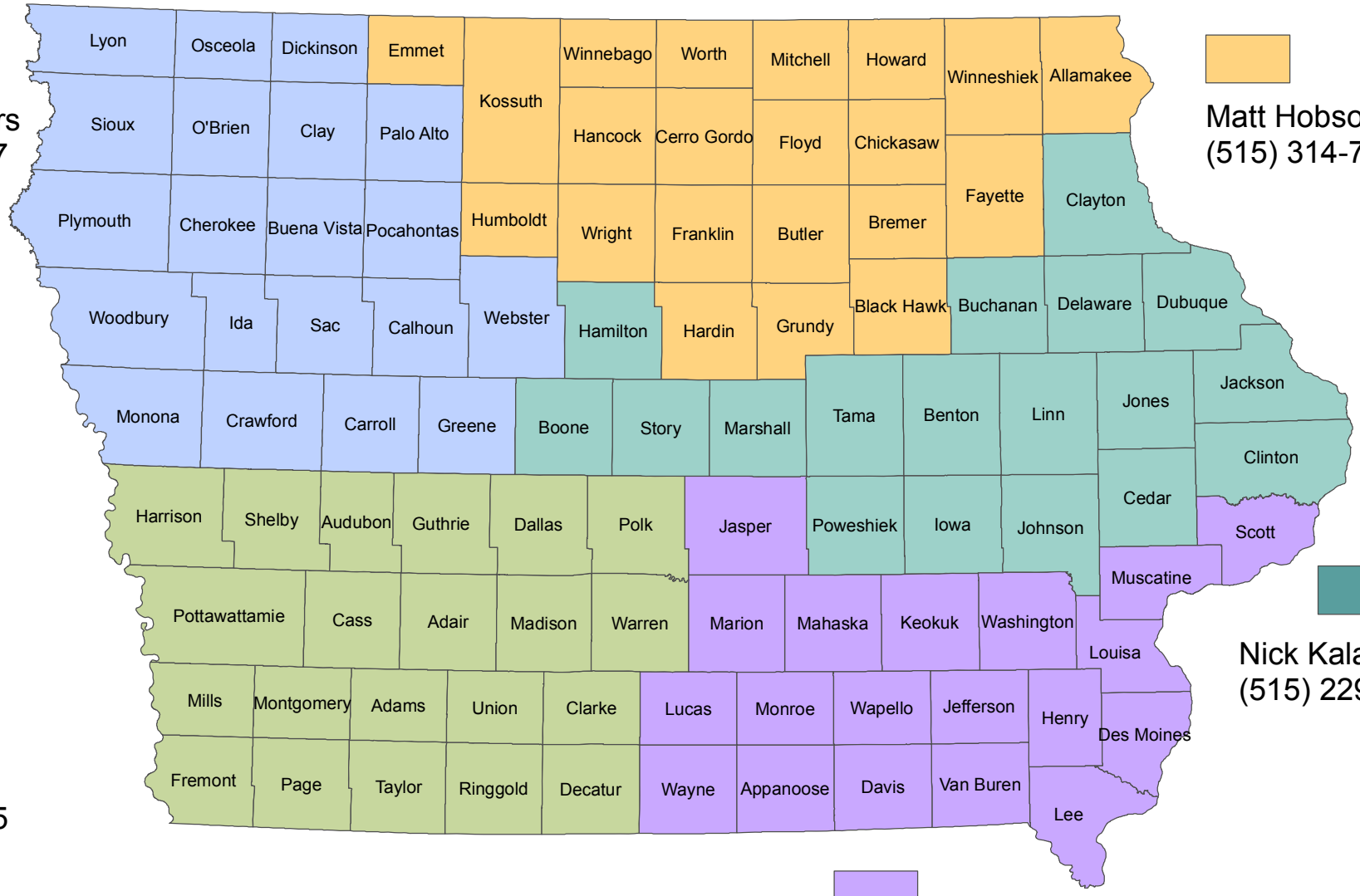


December 2012

CCNC Number	CCNC Name	Child Health Agency	CCNC Phone	CCNC E-Mail Address
1	Kate Phillips	Black Hawk County Health Department	(319) 292-2229 Office (319) 29-1734 Cell	Kphillips@co.black-hawk.ia.us
2	New Opportunities, Inc	New Opportunities, Inc	(712) 792-9266	
3	Washington County Public Health	Washington County Public Health	(319) 653-7758	
4	Cyndi Mason	Lee County Health Department	(319) 372-5225	cmason@leecountyhd.org
5	Darla Butikofer	Visiting Nurse Association of Dubuque	(563) 245-1145	darla.butikofer@finleyhospital.org
6	Deb Baldwin	Mid-Sioux Opportunity, Inc	(712) 786-3487	dbaldwin@midsioux.org
7	Deb Gimer	MATURA (BV), New Opportunities, Inc (Sac), NICAO (Koss, Winn) & Webster County Health Department (Greene, Emmet, Cal, PA, Poc)	(712) 297-8323	dgimer@calhouncountyiowa.com
8	Deidre Buttz	Marion County Public Health	(641) 342-3724	DButtz@grm.net
9	Johnson County Public Health	Johnson County Public Health	(319) 356-6042	
10	Family, Inc	Family, Inc	(712) 256-9566	
11	Emily Schroder	Family, Inc	(712) 256-9566	emily@familyia.org
12	Heidi Hotvedt	Visiting Nurse Services of Iowa	(563) 652-4048	heidi.hotvedt@jcrhc.org
13	Jane Matzen	Lee County Health Department	(641) 682-3449	jmatzen@ahfa.org
14	Jean Randolph	Hawkeye Area Community Action Program	(319) 739-0029	jrandolph@hacap.org
15	Julie Kixmiller	Crawford County Home Health	(712) 243-8006	kixmiljk@ihs.org
16	Julie Thomas	Taylor County Public Health	(712) 523-3405	jthomasmch@frontier.com
17	Chris Lee	New Opportunities, Inc	(712) 792-9266 Ext. 208	CLee@newopp.org
18	Kelly Bailey	Warren County Health Services	(641) 342-3724	bkelly@iowatelecom.net
19	Kim Gonzales, Cynthia Klein	Dubuque Visiting Nurse Association	(563) 556-6200	Kim.Gonzales@FinleyHospital.org; cynthia.klein@finleyhospital.org
21	Lori Hoch	Crawford County Home Health	(712) 263-3303	lorihochrn@yahoo.com
22	Lee County Health Department	Lee County Health Department	(319) 372-5225	
23	Jessica Redden	Scott County Health Department	(563) 326-8618	Jessica.Redden@scottcountyiowa.com
24	Mid-Iowa Community Action	Mid-Iowa Community Action	(800) 890-8230	
25	Mid-Sioux Opportunity, Inc	Mid-Sioux Opportunity, Inc	(800) 859-2025	
26	Nancy Granaman	Lee County Health Department	(319) 750-5258	bngranaman@gmail.com
27	North Iowa Community Action	North Iowa Community Action	(641) 423-5044	
28	Nicole Olhausen	Siouxland Community Health Center	(712) 252-2477	nolhausen@slandchc.com
29	Patti Scieszinski	Marion County Public Health	(641) 774-4312	pski@lucasco.org
30	Sandy Hill	Trinity Muscatine Public Health	(563) 263-0122	Sandra.Hill@trinitymuscatine.org.
31	Marion County Public Health	Marion County Public Health	(641) 828-2238	rcecil@marionph.org
32	Shannon Knudson	Mid-Iowa Community Action	(515) 298-4896	shannon.knudsen@micaonline.org
33	Sharon Campbell	MATURA	(641) 782-8431	scampbell@maturaaction.org
34	Shelly Jensen	Warren County Health Services	(515) 961-1074	shellyj@co.warren.ia.us
35	Jennifer Matters	Mid-Iowa Community Action	(641) 328-9133	jennifer.matters@micaonline.org
36	Tricia Nichols	Webster County Health Department	(515) 573-4107	tnichols@webstercountyia.org
37	Trish Dillard	MATURA	(712) 240-0281	tdillard@maturaact.org
38	Jeanette Luthringer	Visiting Nurse Services of Iowa	(515) 558-9604	jeannettel@vnsia.org
	Heather Jenks	Visiting Nurse Services of Iowa	(515) 557-9013	heatherj@vnsdm.org
	Kara Wall	Visiting Nurse Services of Iowa	(515) 557-9025	karaw@vnsia.org

	Amy Karaidos	Visiting Nurse Services of Iowa	(515) 558-9947	amyk@vnsdsm.org
	Kristin Sjulin	Visiting Nurse Services of Iowa	(515) 558-9960	Kristins@vnsdsm.org
	Joanna Cox	Visiting Nurse Services of Iowa	(515) 558-9968	joannac@vnsia.org
39	Wendy Taylor	North Iowa Community Action Organization (Butler, Cerro Gordo, Franklin, Hancock & Worth) & Black Hawk County Health Department (Bremer, Grundy)	(641) 423-5044	wtaylor@nicao-online.org
40	Marsha Platt	Black Hawk County Health Department	(319)415-8912 Cell (319) 292-2409 Office	mplatt@co.black-hawk.ia.us
41	Terri Sinclair	Marion County Public Health	(641) 437-4332	tsinclair@appanoosecounty.net

CADE Epidemiologist Coverage by County



Rob Ramaekers
(515) 314-7017

Matt Hobson
(515) 314-7259

Nick Kalas
(515) 229-0187

Chris Galeazzi
(515) 314-5895

Diana Von Stein
(515) 954-9499

04/16/14

Iowa Department of Public Health
Environmental and Occupational Surveillance
Reportable Poisonings, Injuries, Diseases, Conditions, and Exposures

IDPH Environmental Health (EH) hotline (Mon-Fri 8 am-4:30 pm): 800-972-2026
IDPH 24/7 Disease reporting hotline: 800-362-2736
IDPH Environmental Health Fax: 515-281-4529
IDPH EH Division Web Page: www.idph.state.ia.us/eh/default.asp
IDPH Bureau of Emergency Medical Services (EMS) Web Page: www.idph.state.ia.us/ems/data.asp

OUTBREAK REPORTING - CALL THE 24/7 DISEASE REPORTING HOTLINE: 800-362-2736
IMMEDIATELY report to the department outbreaks of any kind, diseases (including those not specifically noted) that occur in unusual numbers or circumstances, unusual syndromes, or uncommon diseases. Outbreaks may be infectious, environmental or occupational in origin and include food-borne outbreaks or illness secondary to chemical exposure (e.g., pesticides, carbon monoxide, anhydrous ammonia).

BIOTERRORISM REPORTING - CALL THE 24/7 DISEASE REPORTING HOTLINE: 800-362-2736
IMMEDIATELY report diseases, syndromes, poisonings and conditions of any kind suspected or caused by a biological, chemical, or radiological agent or toxin when there is reasonable suspicion that the disease, syndrome, poisoning or condition may be the result of a deliberate act such as terrorism (but are not limited to) anthrax, mustard gas, sarin gas, ricin, tularemia and small pox.

ELEVATED BLOOD LEAD TEST RESULTS GREATER THAN OR EQUAL TO 20 UG/DL- CALL THE EH HOTLINE: 800-972-2026
IMMEDIATELY during regular business hours (Mon-Fri 8am to 4:30 pm) report all blood lead test results greater than or equal to 20 ug/dL to the Environmental Health hotline and fax a hard copy of the result to the EH fax.

ROUTINE REPORTING
Reports not meeting the conditions given for immediate reporting shall report as directed below, using electronic or web-based reporting if available, or another IDPH approved reporting format. Iowa trauma nurse coordinators and data registrars in the trauma hospitals of Iowa can continue to use the Trauma Registry software for reporting agricultural related injuries and traumatic brain and spinal cord injuries or EMS approved hard copy report forms. Refer to the IDPH EH Web page for more details, approved formats, forms, and specific disease/poisoning/injury/condition reporting information.

WHO IS REQUIRED TO REPORT
Mandatory Reporting is required of health care providers, clinics, hospitals, clinical laboratories, and other health care facilities; school nurses or school officials; poison control and information centers; medical examiners; occupational nurses. Hospitals, health care providers, and clinical laboratories outside the state of Iowa for confirmed or suspect cases in an Iowa resident. Complete information can be found in the Iowa Administrative Code [641] Chapter 1, which is linked at the IDPH EH Division Web page.

For more information, please refer to the IDPH EH Division Web page at www.idph.state.ia.us/eh/default.asp or call the Environmental Health hotline during regular business hours.

Reportable Disease Information

IOWA DISEASE REPORTING CARD

FAX VERSION

Disease reporting is required by Iowa Administrative Code [641]-1 (139A)

Fax report to (515) 281-5698 or call (800) 362-2736

DISEASE AND LABORATORY INFORMATION

DISEASE/EVENT: _____ **Laboratory:** _____

Diagnosis date: / / **Lab city/state/zip:** _____

Onset date: / / **Collection date:** / /

Outcome: ☐Survived this illness ☐Died from this illness ☐Died unrelated to this illness ☐Unknown **Specimen source:** _____

Provider name: _____ **Lab test:** _____

Provider title: ☐ARNP ☐DO ☐MD ☐NP ☐PA **Result date:** / /

Facility name: _____ **Result:** ☐Positive/detected ☐Undetermined ☐Negative/undetected ☐Equivocal ☐Other: _____

Address: _____

Phone : ( ) - **City/State/Zip:** _____

Clinical sx: ☐Abdominal pain ☐Cough ☐Gland swelling ☐Sore throat ☐Anorexia ☐Diarrhea ☐Jaundice ☐Stiff neck ☐Bull's eye rash ☐Fever ☐Rash ☐Vomiting Other: _____

☐ **Specimen sent to UHL**

PATIENT INFORMATION

Name (last, first, middle): _____

Address: _____

City: _____ **County:** _____ **Zip:** _____

Long-term care resident: ☐Yes ☐No ☐Unk **Facility name:** _____

DOB: / / **Age:** _____ ☐Years ☐Months **Gender:** ☐M ☐F ☐Unk

Pregnant? ☐Yes ☐No ☐Unk **Due Date:** / /

Race: ☐White ☐Black or African American ☐American Indian or Alaska Native ☐Hawaiian or Pacific Islander ☐Asian ☐Unknown ☐Other

Marital status: ☐Single ☐Married ☐Widowed ☐Unknown ☐Divorced

Ethnicity: ☐Hispanic or Latino ☐Not Hispanic or Latino ☐Unknown

If minor, Parent name(s): _____

Phone: Home ( ) - Work ( ) - Other ( ) -

OCCUPATION INFORMATION

Job title: _____ **Facility name:** _____

Worked after symptom onset: ☐Yes ☐No ☐Unknown **Address:** _____

Handle food: ☐Yes ☐No ☐Unknown

Attend or provide child care: ☐Yes ☐No ☐Unknown **Zip code:** _____

Attend school: ☐Yes ☐No ☐Unknown

Work in a lab setting: ☐Yes ☐No ☐Unknown **City/State/County:** _____

Work in a health care setting: ☐Yes ☐No ☐Unknown

Direct patient care duties in lab or health care setting: ☐Yes ☐No ☐Unknown **Phone:** ( ) - Type: _____

Health care worker type:

HOSPITALIZATION INFORMATION

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown **Hospital:** _____

Admission date: / / **Discharge date:** / / ☐**Still hospitalized** **Days hospitalized:**

REPORTER INFORMATION

Reporter name: _____ **Reporter facility name:** _____

Reporter phone: _____ **Date reported to IDPH:** _____

Comments:

Revised 2/09

GENERAL INFECTION CONTROL MEASURES

Implementation and adherence to infection control practices are the keys to preventing the transmission of infectious diseases, including respiratory diseases spread by droplet or airborne routes. Recommended infection control practices include:

1. Hand hygiene;
2. Standard Precautions/Transmission-Based Precautions (Contact, Droplet, Airborne)
3. Respiratory hygiene

Hand hygiene is the single most effective means of preventing the spread of all infections among hospital patients and personnel. When followed properly, each of these practices decreases the risk of spreading common respiratory pathogens

Hand Hygiene

Proper hand hygiene is the most effective way to prevent the spread of infection. Detailed hand hygiene information is available on the CDC website at www.cdc.gov/handhygiene. To properly wash and clean hands, the following procedure should be followed:

- Wash hands when they are visibly dirty or soiled with blood or other body fluids. Wash hands with either a non-antimicrobial soap or an antimicrobial soap and water. When washing hands with soap and water, wet hands first with water, apply to hands the amount of product recommended by the manufacturer, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel or air dryer. Use a dry paper towel, if available to turn off the faucet.
- If hands are not visibly soiled, an alcohol-based hand rub or gel may be used in place of soap and water in most circumstances. When using an alcohol-based hand rub or gel, apply product to the palm of one hand and rub hands together, covering all surfaces of hands and fingers, until the hands are dry.
- Avoid wearing artificial fingernails when caring for patients at high risk for infection, and keep natural nail tips less than 1/4-inch long.
- Wear gloves when contact with blood or other potentially infectious materials, mucous membranes, and non-intact skin could occur.
- Remove gloves after caring for a patient. Always perform hand hygiene after removing gloves. Do not wear the same pair of gloves for the care of more than one patient, and do not wash gloves between uses with different patients.
- Change gloves during patient care if moving from a contaminated body site to a clean body site.

Standard Precautions

The Standard Precautions/Transmission-Based Precautions system is designed to prevent the transmission of infectious agents. It requires the use of work practice controls and protective apparel for all contact with blood and body substances, but uses Airborne Infection Isolation, Droplet, and Contact Precautions for patients with diseases known to be transmitted in whole or in part by those routes. Standard Precautions include consistent and prudent preventive measures to be used at all times regardless of a patient's known infection status, and include:

Hand hygiene. Practice hand hygiene after touching blood, body fluids, secretions, excretions, or contaminated items, whether or not gloves are worn. Wash hands immediately after gloves are removed, between patient contacts, and when otherwise indicated to avoid transfer of microorganisms to other patients or environments.

Gloves. Wear gloves (clean, nonsterile gloves are adequate) when touching blood, body fluids, secretions, excretions, or contaminated items. Put on clean gloves just before touching mucous membranes and non-intact skin. Change gloves between tasks and procedures. Practice hand hygiene whenever gloves are removed.

Mask, eye protection/face shield. Wear a mask and adequate eye protection (eyeglasses are not acceptable), or a face shield to protect mucous membranes of the eyes, nose, and mouth during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.

Gown. Wear a gown (a clean, nonsterile gown is adequate) to protect skin and to prevent soiling of clothing during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions or excretions. Carefully, remove a soiled gown as promptly as possible, to avoid contamination of personal clothing, and wash hands.

Patient care equipment. Handle used patient care equipment soiled with blood, body fluids, secretions, or excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to one's self, other patients and the environment. Ensure that reusable equipment is not used for the care of another patient until it has been cleaned and sanitized appropriately. Ensure that single-use items are discarded properly.

Contact Precautions

In addition to Standard Precautions, Contact Precautions should be used for the care of patients known or suspected to have illnesses that could be spread by usual contact with an infected person, or by the contaminated environmental surfaces or patient care items in the room. Example of diseases/organisms requiring Contact Precautions include:

- Severe Acute Respiratory Syndrome (SARS): See "SARS Infection Control" section
- Parainfluenza virus
- Respiratory syncytial virus
- Varicella (chickenpox): Also requires Airborne Infection Isolation
- Herpes Zoster (disseminated or in the immunocompromised host): Also requires Airborne Infection Isolation

Gown. Wear a gown when entering the room. Remove the gown before leaving the patient's environment. After gown removal, ensure that clothing does not contact potentially contaminated environmental surfaces. Wash hands.

Patient transport. Limit the movement of the patient from the room to essential purposes only. During transport, ensure that all precautions are maintained.

Patient care equipment. When possible, dedicate the use of noncritical patient care equipment to a single patient (or cohort of patients infected or colonized with the pathogen requiring precautions) to avoid sharing between patients. If use of common equipment or items is unavoidable, then adequately clean and disinfect them before use for another patient.

Patient placement (private room). Place the patient in a private room. If a private room is not available, place the patient in a room with other patients with the same illness (cohorting).

Contact Precautions include:

Gloves, gown and hand hygiene. Wear gloves when entering the room. During the course of providing care for a patient, change gloves after having contact with infective material. Wear gown to protect clothing if contact with body fluids is anticipated. Remove gloves and gown before leaving the patient's room and practice hand hygiene immediately with an antimicrobial agent or a waterless antiseptic agent. After glove removal and hand hygiene, ensure that hands do not touch potentially contaminated surfaces or items in the patient's room.

Droplet Precautions

In addition to Standard Precautions, use Droplet Precautions for a patient known or suspected to be infected with microorganisms transmitted by droplets (large-particle, wet droplets [larger than 5µm in size]) that can be generated by the patient during coughing, sneezing, talking, or the performance of procedures.

Examples of diseases/organisms requiring Droplet Precautions include:

- Invasive Hemophilus influenzae disease: meningitis, pneumonia (in infants and small children), epiglottitis
- Invasive Neisseria meningitidis disease: meningitis, pneumonia, and bacteremia
- Mycoplasma pneumonia
- Group A streptococcal pneumonia, pharnygitis, or scarlet fever in infants and young children
- Influenza
- Adenovirus: Also requires Contact Precautions
- Parvovirus B19
- Rubella

Droplet Precautions include:

Patient placement. Place the patient in a private room. When a private room is not available, place the patient in a room with a patient(s) who has active infection with the same microorganism but with no other infection (cohorting). When a private room is not available and cohorting is not achievable, maintain spatial separation of at least three feet between the infected patient and other patients and visitors. Special air handling and ventilation are not necessary, and the door may remain open.

Mask. In addition to standard precautions, wear a mask or respirator when working within three feet of the patient. (Hospitals may want to implement the wearing of a mask to enter the room.)

Patient transport. Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplets by masking the patient, if possible.

Airborne Infection Isolation

In addition to Standard Precautions, Airborne Infection Isolation measures are designed to reduce the risk of transmission of infectious agents that may be suspended in the air in either small particle aerosols or dust particles. Patients requiring Airborne Infection Isolation must be given a private room with special air handling and ventilation (negative pressure). Respiratory protection for healthcare workers is necessary when entering the patient's room.
Examples of diseases/organisms requiring Airborne Infection Isolation include:

- SARS: See "SARS Infection Control" section
- Tuberculosis (pulmonary or laryngeal, suspected or confirmed)
- Varicella: Also requires Contact Precautions
- Herpes Zoster (shingles) in an immunocompromised patient: Also requires Contact Precautions
- Measles (rubeola)

Airborne Infection Isolation includes:

Patient placement. Airborne Infection Isolation requires a negative pressure room in addition to a private room. Keep the room door closed and the patient in the room. When a private room is not available, place the patient in a room with a patient who has active infection with the same microorganism, but with no other infection (cohorting).

Respiratory protection. Respiratory protection must be worn when entering the room of a patient in Airborne Infection Isolation. A NIOSH-certified, fit-tested disposable N-95 respirator mask is recommended for all persons entering the room, including visitors. The use of higher-level respirators may be considered for certain procedures. If a particulate respirator with filter efficiency of 95% or greater is not available, a surgical mask should be worn. The mask should fit tightly around the nose and mouth to protect against large droplet transmission.

Respiratory Hygiene/Cough Etiquette

"Respiratory hygiene" is a term that has been adopted by the Centers for Disease Control and Prevention (CDC) and the Iowa Department of Public Health (IDPH) to describe measures that can be taken to decrease the risk of spreading respiratory pathogens. A universal "respiratory hygiene/cough etiquette" strategy for a healthcare facility should include the following:

- Place signs at the entrances of all outpatient facilities requesting that patients and visitors inform healthcare personnel of respiratory symptoms upon registration.
- Provide masks (e.g., surgical) for all patients presenting with respiratory symptoms (especially cough) and provide instructions on the proper use and disposal of masks.

- If a patient cannot wear a mask, provide tissues and instructions on when to use them (i.e., when coughing, sneezing or controlling nasal secretions), how and where to dispose of them, and the importance of hand hygiene after handling this material (cough etiquette).
- Provide hand hygiene materials in waiting room areas and encourage patients with respiratory symptoms to wash their hands.
- If possible, designate an area in waiting rooms where patients with respiratory symptoms can be segregated (ideally by more than three feet) from other patients without respiratory symptoms.
- Place patients with respiratory symptoms in a private room or cubicle as soon as possible for further evaluation.
- Healthcare workers evaluating patients with respiratory symptoms should wear a surgical or procedure mask.
- Consider the installation of Plexiglas barriers at the point of triage or registration to protect healthcare workers.
- If a physical barrier is not possible, instruct registration and triage staff to remain at least three feet from unmasked patients. Staff should consider wearing a surgical mask during registration and triage.
- Continue to use Droplet Precautions to manage patients with respiratory symptoms until it is determined that the cause of symptoms is not an infectious agent that requires precautions beyond Standard Precautions.

Iowa Department of Public Health

Minimal Recommendations for Use of Surgical or Procedure Masks and Respirators Around Patients with Cough Illness

Influenza, pertussis and other diseases are transmitted via droplets produced by coughing. The following infection prevention guidelines are recommended when caring for anyone presenting with a cough illness. Clinicians or infection preventionists may recommend additional infection prevention measures if indicated by a specific patient or situation in the community.

Standard Precautions and Droplet Precautions should be used when caring for all patients with a cough illness.

Masks
A mask should fit snugly around the nose and mouth to prevent gaps, forcing air flow through the mask.

Standard Precautions
For complete guidelines visit: www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html.

Droplet Precautions
Health care providers should wear surgical or procedure masks when giving direct care to patients with a cough illness.

Specimen collection:
Use standard and droplet precautions for most specimen collection.

Aerosol-generating procedures (e.g. intubation, bronchoscopy, open-system respiratory suctions, resuscitation, autopsy, etc.)

- Particulate respirator (e.g. EU FFP2, USNIOSH-certified N-95)
- Eye protection
- A clean non-sterile, long sleeved gown
- Gloves (some of these procedures require sterile gloves)

Transport within healthcare facilities (for transport of patients with cough illness).

- Patient should wear a surgical or procedure mask when outside the patient's room.
- Encourage performance of hand hygiene frequently and follow respiratory hygiene and cough etiquette practices.

Transport between patient residence and healthcare facilities (for transport of patients with cough illness)

- Patient should wear a surgical or procedure mask when outside the patient's room.
- Transporters should wear a surgical or procedure mask whenever the patient is not masked.

Clinics, medical offices or other ambulatory care settings

- Patients with a cough illness in outpatient settings should be asked to wear a surgical or procedure mask until being examined in the exam room and again upon leaving the exam room.
- Staff who have close contact, including examining or providing direct patient care, should wear a surgical or procedure mask and put the mask on before entering the room.
- Staff should perform hand hygiene, and then put on mask followed by gloves. When patient care is complete, first remove gloves, then remove the mask, and lastly perform hand hygiene.

For additional information on Standard Precautions and Droplet Precautions, respiratory hygiene and cough etiquette go to www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html.

Revised 10/2013

Recommended Initial Followup Timelines for Infectious Diseases

Reportable disease	Clinical Diagnosis	Laboratory Criteria	Investigation Begins
Botulism, foodborne	Clinical symptoms include diplopia, blurred vision, and bulbar weakness. Symmetric paralysis that progresses rapidly & that can be linked to a potential food source in the previous 48 hours.	Detection of botulinum toxin in serum, stool, or patients food or isolation of *Clostridium botulinum* from stool	Immediate
Botulism, Infant	Characterized by constipation, poor feeding and "failure to thrive" that may be followed by progressive weakness, impaired respiration and death	Detection of botulinum toxin in stool or serum or isolation of *Clostridium botulinum* from stool	Immediate
Brucellosis	Clinical symptoms include fever, night sweats, undue fatigue, anorexia, weight loss, headache and arthralgia	Isolation of *Brucella* species from clinical specimen, or 4-fold or greater rise in *Brucella* titer > 2 weeks apart or demonstration by immunofluorescence of *Brucella* sp. in clinical specimen	24 hours
Diphtheria	Insidious onset, membranous pharyngitis with fever, enlarged anterior cervical lymph nodes, and edema of the surrounding soft tissue – "Bull Neck"	Isolation of *C. diphtheriae* from a clinical specimen, or Histopathologic diagnosis of diphtheria.	Immediate strict isolation
Encephalitis, arboviral	Clinical symptoms include febrile illness of variable severity associated with neurologic symptoms ranging from headache to aseptic meningitis or encephalitis.	4-fold or greater change in serum antibody titer, or isolation of virus form tissue, blood, CSF or other body fluid or specific IgM.	72 hours
Escherichia coli O157:H7	Clinical symptoms include diarrhea, often bloody and abdominal cramps, may be complicated by HUS or TTP, asymptomatic infection may also occur	Isolation of *E. coli* O157:H7 from a specimen or isolation of Shiga toxin-producing *E. coli* O157:NM from a clinical specimen	24 hours
Haemophilus Influenzae type B	Invasive disease caused by H. influenzae may produce any of several clinical syndromes, including meningitis, bacteremia, epiglottitis, or pneumonia.	Isolation of *H. influenzae* from a normally sterile site (e.g., blood or cerebrospinal fluid (CSF) or, less commonly, joint, pleural, or pericardial fluid)	48 hours
Hansen's Disease	Characterized by the involvement of primarily of skin as well as peripheral nerves and the mucosa of the upper airway.	Demonstration of AFB in skin or dermal nerve, obtained from full-thickness skin biopsy of a lepromatous lesion	5 days
Hantavirus syndromes	Characterized by bilateral interstitial pulmonary infiltrates and respiratory compromise usually requiring supplemental oxygen and clinically resembling ARDS.	Detection of hantavirus-specific IgM or rising titers of hantavirus-specific IgG, or detection of hantavirus-specific ribonucleic acid sequence by PCR in clinical specimens	5 days
Hepatitis A	Clinical symptoms include discrete onset of symptoms and Jaundice	Hepatitis A IgM antibody	Immediate
Hepatitis B	Clinical symptoms include discrete onset of symptoms and Jaundice	Hepatitis B core IgM antibody positive, or HBsAg positive	72 hours

Recommended Initial Followup Timelines for Infectious Diseases - cont

Legionellosis	Characterized by fever, myalgia, cough, pneumonia	Isolation of *legionella* from clinical specimen, 4-fold rise in titer against *L. pneumophila* serogroup 1, detection of *L. pneumophila* serogroup 1 in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody testing or , demonstration of *L. pneumophila* serogroup 1 antigens in urine by radioimmunoassay or enzyme-linked immunosorbent assay.	72 hours
Listeria monocytogenes invasive disease	Clinical symptoms include those of meningitis or bacteremia. Infection during pregnancy may result in fetal loss through miscarriage or stillbirth or neonatal meningitis or bacteremia.	Isolation of *L. monocytogenes* for a normally sterile site. Isolation of *L. monocytogenes* from placental or fetal tissue	48 hours
Lyme Disease	The best clinical marker for Lyme disease is the initial skin lesion-erythema migrans, late manifestations effect the musculoskeletal system, nervous system or cardiovascular system	Isolation of *Borrelia burgdorferi* from a clinical specimen, IgM antibodies to *Borrelia burgdorferi* in serum or CSF.	5 days
Malaria	Clinical symptoms include fever, headache along with various other symptoms including back pain, chills, sweats, nausea, vomiting, diarrhea and cough.	Demonstration of malaria parasites in blood films.	5 days
Measles	An illness characterized by all of the following: a generalized maculopapular rash lasting > 3 days; a temperature > 101ºF (38.3ºC); cough, coryza, or conjunctivitis	Positive serologic test for measles immunoglobulin M (IgM) antibody, or significant rise in measles antibody level by any standard serologic assay, or isolation of measles virus from a clinical specimen.	Immediate
Meningococcal invasive disease	Manifests most commonly as meningitis and/or meningococcemia.	Isolation of *Neisseria meningitidis* from normally sterile site.	Immediate
Mumps	An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting >2 days, and without other apparent cause.	Isolation of mumps virus from clinical specimen, or significant rise between acute and convalescent-phase titers in serum mumps immunoglobulin G (IgG) antibody level by any standard serologic assay, or positive serologic test for mumps immunoglobulin M (IgM) antibody.	48 hours
Pertussis	A cough illness lasting at least 2 weeks with one of the following: paroxysms of coughing, inspiratory "whoop," or post-tussive vomiting, and without other apparent cause.	Isolation of *B. pertussis* from a clinical specimen, or positive polymerase chain (PCR) reaction assay for B. pertussis.	48 hours

Recommended Initial Followup Timelines for Infectious Diseases - cont

Polio	Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss.	Poliovirus isolation is highest from stool specimens, intermediate from pharyngeal swabs, and very low from blood or spinal fluid. To increase the probability of poliovirus isolation, at least two stool specimens should be obtained 24 hours apart from patients with suspected poliomyelitis as early in the course of disease as possible (ideally within 15 days after onset).	48 hours
Psittacosis	Characterized by fever, chills, headache, photophobia, cough and myalgia	Isolation of *Chlamydia psittaci* from respiratory secretions, or 4-fold or greater rise in antibody titer against *C. psittaci*, or presence of IgM antibody against *C. psittaci*	24 hours
Rocky Mountain Spotted Fever	Characterized by acute onset of myalgia, headache, and petechial rash.	4-fold rise in titer to *Rickettsia rickettsii*, Positive PCR to *Rickettsia rickettsii,* demonstration of positive immunofluorescence of skin lesion or organ tissue, or isolation of *R. rickettsii* from clinical specimen.	5 days
Rubella	An illness that has all of the following characteristics: acute onset of generalized maculopapular rash; temperature >99ºF (37.2ºC), if measured; arthralgia/arthritis, lymphadenopathy, or conjunctivitis	Isolation of rubella virus, or significant rise between acute and convalescent-phase titers in serum rubella immunoglobulin G (IgG) antibody level by any standard serologic assay, or positive serologic test for rubella immunoglobulin M (IgM) antibody.	24 hours
Salmonellosis	Common symptoms include diarrhea, abdominal pain, nausea and sometimes vomiting, asymptomatic infections may occur.	Isolation of *Salmonnella* from clinical specimen.	24 hours
Shigellosis	Characterized by diarrhea, fever, nausea, cramps and tenesmus, asymptomatic infections may occur.	Isolation of *Shigella* from a clinical specimen.	24 hours
Tetanus	Acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck) and generalized muscle spasms without other apparent medical cause.	There are no laboratory findings characteristic of tetanus. The diagnosis is entirely clinical.	48 hours
Toxic Shock Syndrome	Fever > 102, diffuse macular erythroderma rash, BP < 90, and multisystem involvement.	May be negative or positive culture for *Staphylococcus aureus* or group A *Streptococcus* from a normally sterile site.	5 days
Trichinosis	Characterized by fever, myalgia, and periorbital edema	Demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy, or positive serologic test for *Trichinella*	5 days
Tuberculosis	Positive TB skin test, prolonged cough, night sweats, and weight loss.	Isolation of *M. tuberculosis* from a clinical specimen.	48 hours

Iowa Department of Public Health Table of Reportable Communicable and Infectious Diseases

To report diseases immediately, use the 24/7 disease reporting telephone hotline: 1-800-362-2736

OUTBREAK REPORTING

IMMEDIATELY report to the department outbreaks of any kind, diseases that occur in unusual numbers or circumstances, unusual syndromes, or uncommon diseases. Outbreaks may be infectious, environmental or occupational in origin and include food-borne outbreaks or illness secondary to chemical exposure (e.g., pesticides, anhydrous ammonia).

BIOTERRORISM REPORTING

IMMEDIATELY report diseases, syndromes, poisonings and conditions of any kind suspected or caused by a biological, chemical, or radiological agent or toxin when there is reasonable suspicion that the disease, syndrome, poisoning or condition may be the result of a deliberate act such as terrorism. Examples of these include (but are not limited to) anthrax, mustard gas, sarin gas, ricin, tularemia and small pox.

Report cases of the diseases listed in the following table to the department within the time frame specified in the *When to Report* column and by the reporting method in the *How to Report* column.

Disease	When to Report	How to Report
Acquired immune deficiency syndrome (AIDS) and AIDS-defining conditions	7 days	Report by mail • Health care providers: Use the Pediatric or Adult Confidential Case Report form • Laboratories: Send copy of lab report or the Iowa Confidential Report of Sexually Transmitted Disease & HIV Infection • Mark envelope “Attention 03”
Anthrax	1 day	Phone, IDSS, or fax
Arboviral disease (includes West Nile Disease, St. Louis, LaCrosse, WEE, EEE, VEE encephalitis)	3 days	Phone, IDSS, fax or mail
Botulism	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Brucellosis (*Brucella*)	3 days	Phone, IDSS, fax or mail
Campylobacteriosis (*Campylobacter*)	3 days	Phone, IDSS, fax or mail
Chlamydia	3 days	Report by mail • Health care providers: Use the Iowa Confidential Report of Sexually Transmitted Disease and HIV Infection • Laboratories: Use the Laboratory Report of Tests Processed for STD • Mark envelope “Attention 00”
Cholera	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Cryptosporidiosis	3 days	Phone, IDSS, fax or mail
Cyclospora	3 days	Phone, IDSS, fax or mail
Diphtheria	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Enterococcus invasive disease	3 days	Laboratories: Send isolate to the University Hygienic Laboratory
Escherichia coli shiga toxin-producing and related diseases (includes HUS and TTP)	3 days	Phone, IDSS, fax or mail Laboratories: Send isolate to the University Hygienic Laboratory
Giardiasis (*Giardia*)	3 days	Phone, IDSS, fax or mail
Gonorrhea	3 days	Report by mail • Health care providers: Use the Iowa Confidential Report of Sexually Transmitted Disease and HIV Infection • Laboratories: Use the Laboratory Report of Tests Processed for STD • Mark envelope “Attention 00”
Group A Streptococcus invasive disease	3 days	Send isolate to the University Hygienic Laboratory
Haemophilus influenzae type B invasive disease	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736 Laboratories: Send isolate to the University Hygienic Laboratory
Hansen’s disease (leprosy)	3 days	Phone, IDSS, fax or mail
Hantavirus syndromes	3 days	Phone, IDSS, fax or mail
Hepatitis A	1 day	Phone, IDSS or fax
Hepatitis B, C, D, E	3 days	Phone, IDSS, fax or mail
Human immunodeficiency virus (HIV) cases Death of a person with HIV Perinatally exposed newborn and child (newborn and child who was born to an HIV-infected mother)	7 days	Report by mail • Health care providers: Use the Pediatric or Adult Confidential Case Report Form • Laboratories: Send copy of lab report or the Iowa Confidential Report of Sexually Transmitted Disease & HIV Infection • Mark envelope “Attention 03”
Legionellosis (*Legionellae*)	3 days	Phone, IDSS, fax or mail
Listeria monocytogenes invasive disease	1 day	Phone, IDSS, or fax – Laboratories: Send isolate to the University Hygienic Laboratory
Lyme disease	3 days	Phone, IDSS, fax or mail
Malaria	3 days	Phone, IDSS, fax or mail
Measles (rubeola)	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Meningococcal invasive disease	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736 Laboratories: Send isolate to the University Hygienic Laboratory
Mumps	3 days	Phone, IDSS, fax or mail
Pertussis	3 days	Phone, IDSS, fax or mail
Plague	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Poliomyelitis	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Psittacosis	3 days	Phone, IDSS, fax or mail
Rabies, animal	3 days	Phone, IDSS, fax or mail

Rabies, human	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Rocky Mountain spotted fever	3 days	Phone, IDSS, fax or mail
Rubella (including congenital)	1 day	Phone, IDSS, fax or mail
Salmonellosis (*Salmonella*)	3 days	Phone, IDSS, fax or mail Laboratories: Send isolate to the University Hygienic Laboratory
Severe acute respiratory syndrome (SARS)	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Shigellosis (*Shigella*)	3 days	Phone, IDSS, fax or mail Laboratories: Send isolate to the University Hygienic Laboratory
Smallpox	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Staphylococcus aureus:		
Invasive disease	Quarterly	Laboratories: Mail the number of isolates to University Hygienic Laboratory
Methicillin-resistant, invasive disease	3 days	Laboratories: Send isolates to University Hygienic Laboratory
Vancomycin-resistant S. aureus	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
	24 hours	Laboratories: Send isolates to University Hygienic Laboratory
Streptococcus pneumoniae invasive disease	3 days	Laboratories: Send isolate to the University Hygienic Laboratory
Syphilis	3 days	Report by mail • Health care providers: Use the Iowa Confidential Report of Sexually Transmitted Disease and HIV Infection • Laboratories: Use the Laboratory Report of Tests Processed for STD • Mark envelope "Attention 00"
Tetanus	3 days	Phone, IDSS, fax or mail
Toxic Shock Syndrome	3 days	Phone, IDSS, fax or mail
Trichinosis	3 days	Phone, IDSS, fax or mail
Tuberculosis		
Pulmonary and laryngeal (infectious)	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Extra-pulmonary	3 days	Phone, IDSS, fax or mail
Typhoid fever	1 day	Phone, IDSS or fax
Viral hemorrhagic fever (VHF) (e.g., Lassa, Marburg, Ebola, Crimean-Congo, South American)	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736
Yellow Fever	**Immediately**	24/7 disease reporting telephone hotline: 800-362-2736

Reporting of the above diseases is required by Iowa Administrative Code [641] Chapter 1

Iowa Department of Public Health/Center for Acute Disease Epidemiology
Lucas State Office Building, 321 E. 12th Street Des Moines, Iowa 50319-0075 Phone- 800-362-2736 Secure fax- 515-281-5698

Iowa Disease Surveillance System (IDSS) related questions, call the Center for Acute Disease Epidemiology (CADE) at 1-800-362-2736
STD questions- call 515 281-3031….HIV/AIDS questions- call 515-242-5141
Immunization questions- call 515-281-4938……TB questions- call 515 281-7504
Specimen submission questions –call the University Hygienic Laboratory 319-335-4500 or go to http://www.uhl.uiowa.edu/

Reporting forms may be obtained from the Clearing house at: http://www.drugfreeinfo.org/state/cart.php

Visit our web site at http://www.idph.state.ia.us

IDPH
Iowa Department of Public Health

Revised Dec 2009

POISONING OR CONDITION	CASES TO REPORT	WHEN TO REPORT	HOW TO REPORT
Agricultural related injury	A non-household injury to a farmer, farm worker, farm family member, or other individual, which occurred on a farm, or in the course of handling, producing, processing, transporting or warehousing farm commodities	Quarterly (recommend weekly)	Routine reporting See EH Div Web page Trauma Registry Users, see EMS Web page.
Arsenic poisoning	Blood arsenic values equal to or greater than 70 µg/L Urine arsenic values equal to or greater than 100 µg/L of urinary creatinine	Weekly	Routine reporting See EH Div Web page
Blood lead testing	All analytical results greater than or equal to 20 micrograms per deciliter (µg/dL) in a child under the age of 6 years or a pregnant woman	Daily	Phone: 800-972-2026
	All other analytical values for all blood lead analyses	Weekly	Electronic format specified by the department
Cadmium poisoning	Blood cadmium values equal to or greater than 5 µg/L Urine cadmium values equal to or greater than 3 µg/g	Weekly	Routine reporting See EH Div Web page
Carbon monoxide (CO) poisoning	Blood carbon monoxide level equal to or greater than 10% carboxyhemoglobin or its equivalent with a breath analyzer test, or a clinical diagnosis of CO poisoning regardless of any test result	Daily	Phone: 800-972-2026 See EH Div Web page Or: Iowa Statewide Poison Control Center 800-222-1222 for 24 hour consultation followed by fax to IDPH EH.
Hypersensitivity pneumonitis	A disease in which the air sacs (alveoli) of the lungs become inflamed when certain dusts are inhaled to which the person is sensitized or allergic. Includes but is not limited to farmer's lung, silo filler's disease, and toxic organic dust syndrome.	Weekly	Routine reporting See EH Div Web page
Mercury poisoning	Blood mercury values equal to or greater than 2.8 µg/dL Urine mercury values equal to or greater than 20 µg/L	Weekly	Routine reporting See EH Div Web page
Methemoglobinemia	Blood analyses showing greater than 5% of total hemoglobin present as methemoglobin	Weekly (recommend immediate)	Routine reporting See EH Div Web page
Microcystin (Blue-green algal) poisoning*	Gastrointestinal symptoms, respiratory symptoms, dermal symptoms or elevated serum GGT (gamma glutamyl transpeptidase) and a history of exposure within the past seven days to water testing positive for microcystin	Daily from May 1 to Oct. 31	Phone: 800-972-2026
Non-communicable respiratory illness	An illness indicating prolonged exposure or overexposure to asbestos, silica, silicates, aluminum, graphite, bauxite, beryllium, cotton dust or other textile material, or coal dust. Includes, but is not limited to asbestosis, coal worker's pneumoconiosis, and silicosis.	Weekly	Routine reporting See EH Div Web page

POISONING OR CONDITION	CASES TO REPORT	WHEN TO REPORT	HOW TO REPORT
Occupationally related asthma, bronchitis or respiratory hypersensitivity reaction	Any extrinsic asthma or acute chemical pneumonitis due to exposure to toxic agents in the workplace. (ICD-10 codes J67.0 to J67.9) All cases of occupationally induced or exacerbated asthma.	Weekly	Routine reporting See EH Div Web page
Pesticide poisoning	Any acute or subacute systemic, ophthalmologic, or dermatologic illness or injury resulting from or suspected of resulting from inhalation or ingestion of, dermal exposure to, or ocular contact with a pesticide. Laboratory confirmation is not required.	Weekly	Iowa Poison Control Center 800-222-1222 for 24 hour consultation. See EH Div Web page
Severe skin disorder	Dermatoses, burns, and other severe skin disorders which result in death or which require hospitalization or other multiple courses of medical therapy.	Weekly	Routine reporting See EH Div Web page
Traumatic Spinal Cord Injury (TSCI)	An acute, traumatic lesion of the neural elements in the spinal canal, resulting in any degree of sensory deficit, motor deficit, or bladder/bowel dysfunction. The deficit can be temporary, permanent, or result in death. The lesion can occur at any level of the spinal cord and may be complete or incomplete. Spinal cord injuries include: cauda equina, conus medullaris injuries, central cord syndrome, anterior cord syndrome, posterior cord syndrome, Brown-Sequard syndrome, mixed syndrome, and cord compression. Patients presenting neurological symptoms upon admission which resolve before hospital discharge should also be reported.	Quarterly	See Bureau of EMS Web page
Toxic hepatitis	Any acute or subacute necrosis of the liver or other unspecified chemical hepatitis caused by exposure to nonmedicinal toxic agents other than ethyl alcohol including, but not limited to, carbon tetrachloride, chloroform, tetrachloroethane, trichloroethylene, phosphorus, trinitrotoluene (TNT), chloronapthalenes, methylenedianilines, ethylene dibromide, and organicsolvents. (ICD-10 codes K71.0 to K71.9)	Weekly	Routine reporting See EH Div Web page
Traumatic Brain Injury (TBI)	Clinically evident brain damage resulting from trauma or anoxia which temporarily or permanently impairs a person's physical or cognitive functions". The injury may be a penetrating or closed head injury resulting in death, or temporary or permanent impairment. Persons with brain injuries may display loss of consciousness, post-traumatic amnesia, a skull fracture, or damage to brain tissue as evidenced by neurological findings that can be reasonably attributed to a traumatic brain injury.	Quarterly	See Bureau of EMS Web page

*The Director of IDPH has temporarily designated suspected or confirmed cases of exposure to microcystin as a reportable disease.

Reporting of the above diseases is required by Iowa Administrative Code [641] Chapter 1.Chart Revised April 2010.
Visit our web site at http://www.idph.state.ia.us
Iowa Department of Public Health, Lucas State Office Building, 321 E. 12th Street Des Moines, Iowa 50319-0075

Diseases A-B

ANTHRAX

Report Immediately by phone
If bioterrorism suspected

Potential Bioterrorism Agent: Category A

Also known as Woolsorter Disease

Responsibilities:
Hospital: Report immediately by phone if bioterrorism suspected, otherwise within 1 day
Lab: Report by phone immediately if bioterrorism suspected, otherwise within 1 day. Send isolates to the State Hygienic Laboratory (SHL) for confirmation
Physician: Report immediately by phone if bioterrorism suspected, otherwise within 1 day
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Anthrax is a disease caused by the bacterium *Bacillus anthracis*. It is primarily a disease of wild and domestic animals.

B. Clinical Description

Anthrax is an acute bacterial disease, which usually involves the skin, but may involve the upper throat, lower respiratory tract, chest cavity or intestinal tract. Toxins produced by the bacteria cause the tissue and organ damage associated with anthrax.

In anthrax affecting the skin (cutaneous anthrax), itching of an exposed skin surface occurs first. Itching is followed by a small red lesion that progresses to a blister and, ultimately, a scabbed black ulcer (eschar) with significant surrounding edema. Roughly 5% - 20% of people with untreated cutaneous anthrax die, although prompt treatment with effective antibiotics can substantially reduce the risk of death.

Initial symptoms of anthrax of the lower respiratory tract (inhalation anthrax) are usually mild, resembling an upper respiratory infection. Severe symptoms follow within 3 - 5 days, and include respiratory distress, fever and shock, with death following shortly. X-rays typically show a widened mediastinum. Hemorrhagic mediastinitis and/or meningitis are frequent severe complications. Case-fatality estimates for inhalational anthrax are based on incomplete information, but the rate appears to be extremely high. The case-fatality rate is estimated to be approximately 75%, even with all possible supportive care, including appropriate antibiotics.

Intestinal anthrax is rare and tends to occur in foodborne outbreaks. Fever, vomiting of blood, severe diarrhea, blood infection and death typically follow abdominal pain. Even with treatment, the case-fatality rate for intestinal anthrax can approach 50%.

A form of anthrax affecting the upper throat (oropharyngeal anthrax) has also been described.

C. Reservoirs

Wild and domestic hoofed herbivores (plant-eating animals), including livestock, are the main reservoir for anthrax.. The anthrax bacteria are shed in terminal hemorrhages or blood at death. These spores are very resistant to disinfection and adverse environmental conditions, so they are capable of surviving in soil for decades. Skins and hides of infected animals may harbor the spores for years. Worldwide spread of anthrax occurs primarily through dissemination of contaminated skins and hides.

D. Modes of Transmission

Cutaneous infection occurs through: 1) contact with contaminated skins, wool or hides, or products made from these; 2) contact with tissues of animals that are clinically ill or dead from anthrax; 3) contact with soil contaminated with spores or contaminated bonemeal used in gardening; or, 4) rarely, bites by insects that have bitten infected animals or humans.

Inhalation anthrax may occur in environments where animal hides and wool are processed. It may also occur due to accidental or intentional aerosolization of spores, as may occur with a laboratory accident or bioterrorism event.

Intestinal and oropharyngeal anthrax occurs through ingestion of undercooked contaminated meat.

E. Incubation Period

The incubation period for anthrax is usually 1- 7 days, and most cases occur within 2 days of exposure. However, incubation periods of up to 60 days have been reported.

F. Period of Communicability or Infectious Period

Person-to-person transmission has not been documented with inhalation or intestinal anthrax. Person-to-person transmission with cutaneous anthrax rarely occurs. Products and soil contaminated with spores may remain infectious for decades.

G. Epidemiology

Anthrax is primarily a disease of wild and domestic herbivorous (plant-eating) animals. Unaffected herds of livestock may be exposed through feed containing contaminated bonemeal. Anthrax is an infrequent cause of disease in the United States and a sporadic cause of disease in most industrialized countries. Anthrax in animals is common in Central and South America, southern and Eastern Europe, Africa and Asia. Persons at greatest risk of contracting anthrax are those whose occupations may expose them to contaminated meat, hides or wool. Veterinarians and others who handle and treat infected animals are also at risk. In Iowa, anthrax in animals is reported on rare occasions.

H. Bioterrorism Potential

Category A *Bacillus anthracis* is considered a potential bioterrorism agent. If acquired and properly disseminated, *Bacillus anthracis* could cause serious public health harm and would challenge public health in terms of ability to limit the numbers of casualties.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify potential sources of transmission in the United States (*e.g.,* imported wool, livestock, or soil), and to stop transmission from such sources.

- To identify sources of transmission and geographical areas of risk outside the United States and to stop transmission from such sources.
- To identify human and animal cases as early as possible to prevent transmission to other persons or animals, either through direct contact (unlikely) or through spores that form in carcasses of dead animals.
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and healthcare provider immediately report any suspicion of anthrax called to your attention by a healthcare provider or any positive laboratory result pertaining to anthrax. (A case with widened mediastinum and/or hemorrhagic mediastinitis with or without presumptive or confirmatory laboratory results is a suspect case.)

The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736, if calling after business hours, call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides services for testing clinical specimens for *B. anthracis* and for confirmation of isolates from sentinel laboratories. Sentinel laboratories can send specimens (blood, tissue biopsies, discharge fluid, vesicle fluid, etc.) to SHL. Isolates submitted from other laboratories will be confirmed and/or identified. Additionally, SHL requests that all laboratories submit all isolates cultured for further identification to aid in the public health surveillance necessary for this illness as rapidly as possible. SHL needs to be contacted before samples are submitted. For more information on submitting samples, contact SHL at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a. The most important thing a LPHA can do upon learning of a suspect or confirmed case of anthrax, or potential exposure to anthrax, if bioterrorism is suspected, is to immediately call IDPH any time at (800) 362-2736.

b. Case investigation of anthrax in Iowa residents will be directed by IDPH. If a bioterrorism event is suspected, IDPH and other response authorities will work closely with LPHAs and provide instructions/information on how to proceed.

c. Following immediate notification of IDPH, the LPHA may be asked to assist in investigating cases that live within their communities, including gathering the following:
   1) The case's name, age, address, phone number, status (hospitalized, at home, deceased), and parent/guardian information, if applicable.
   2) The name and phone number of the hospital where the case is or was hospitalized.
   3) The name and phone number of the case's attending physician.
   4) The name and phone number of the infection prevention staff at the hospital.
   5) If the patient was seen by a healthcare provider before hospitalization, or seen at more than one hospital, be sure to document these names and phone numbers as well.

d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

Until lesions are healed or free of anthrax bacilli.

Minimum Period of Quarantine of Contacts

No restrictions.

B. Protection of Contacts of a Case

There is no immunization or prophylaxis for contacts of cases. Anthrax is essentially non-contagious.

Standard Precautions are recommended for use for healthcare providers when caring for a patient with anthrax . This includes use of gloves and gowns if soiling of clothing is possible and when in contact with any open wound.

In the event of death, it should be assumed that all body fluids of the deceased person have very high concentrations of *B. anthracis*. Gloves and gowns should be worn when placing the body in a body bag. Contaminated dressings and bedclothes of cases should be burned or steam sterilized to destroy spores. The patient room may require fumigation, depending on the perceived level of contamination. Consultation with CADE is recommended in this type of situation.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Even a single case of human anthrax, especially of the inhalation variety, would be so unusual in the United States that it would warrant immediate reporting to public health and law enforcement authorities for consideration of deliberate use.

Note: For a potential bioterrorism event, IDPH and other response authorities will work closely with local agencies and provide instructions/information on how to proceed.

If the threat of exposure to aerosolized anthrax is credible or confirmed, persons at risk should begin post-exposure with both an appropriate antibiotic and vaccine.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with the Department of Inspection and Appeals (DIA) and CADE. Coordination for pickup and testing of food samples can be done through the DIA. If a commercial product is suspected, DIA will also coordinate follow-up with relevant outside agencies.

Personal Preventive Measures/Education

To avoid cases of anthrax, IDPH recommends the following:

- Individuals at significant on-going risk of acquiring anthrax (*e.g.,* laboratory workers) should be vaccinated.
- Employees who work with hides of potentially infected animals should be educated about anthrax and how to minimize exposures and possibly receive vaccine.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for anthrax can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2000 Red Book: Report of the Committee on Infectious Diseases, 25th Edition.* Illinois, American Academy of Pediatrics, 2000.
Heymann, D.., ed., *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.
CDC. Anthrax website: emergency.cdc.gov/agent/anthrax/index.asp#

FACT SHEET Anthrax

What is anthrax?
Anthrax is a serious disease caused by *Bacillus anthracis*, a bacterium that forms spores. A bacterium is a very small organism made up of one cell. A spore is a cell that is dormant (asleep), but may come to life with the right conditions. There are three main types of anthrax: skin (cutaneous), respiratory (inhalation), and digestive (gastrointestinal).

How do people get anthrax?
Anthrax is not known to spread from one person to another. Anthrax can be spread naturally by exposure to contaminated soil or animals or intentionally when used as a weapon.

- **Anthrax from animals.** Humans can become infected with anthrax by handling products from infected animals or by breathing in anthrax spores from infected animal products (like wool, for example). People also can become infected with gastrointestinal anthrax by eating undercooked meat from infected animals.
- **Anthrax as a weapon.** Anthrax was used as a weapon in the United States in 2001. It was deliberately spread through the postal system by sending letters with powder containing anthrax. This caused 22 cases of anthrax infection.

What are the symptoms?
The symptoms (warning signs) of anthrax are different depending on the type of the disease:

- **Skin:** The first symptom is a small sore that develops into a blister. The blister then develops into a skin ulcer with a black area in the center. This is typically not painful in the beginning stages.
- **Digestive:** Symptoms include nausea, loss of appetite, bloody diarrhea, and fever, followed by bad stomach pain.
- **Lungs:** The first symptoms of inhalation anthrax are like cold or flu symptoms and can include a sore throat, mild fever and muscle aches. Later symptoms include cough, chest discomfort, shortness of breath, tiredness and muscle aches. (Caution: Do not assume that just because a person has cold or flu symptoms that they have inhalation anthrax.)

How soon do infected people get sick?
Symptoms usually appear within 7 days of exposure to the bacterium for all three types of anthrax.

How is anthrax treated?
Antibiotics are used to treat all three types of anthrax. Early identification and treatment are important.

What is the prevention after exposure?
Treatment is different for a person who is exposed to anthrax, but is not yet sick. Healthcare providers will use antibiotics (such as ciprofloxacin, doxycycline, or penicillin). The anthrax vaccine may be given along with these antibiotics to prevent anthrax infection.

Can anthrax be prevented?
There is a vaccine to prevent anthrax, but it is not yet available for the general public. Anyone who may be exposed to anthrax, including certain members of the U.S. armed forces, laboratory workers, and workers who may enter or re-enter contaminated areas, may get the vaccine. Also, in the event of an attack using anthrax as a weapon, people exposed may get the vaccine.

Anthrax

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name: Facility phone: ( )- - Type:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other ____
Organism: Type (e.g. serogroup):

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other ____
Organism: Type (e.g. serogroup):

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Test type: _____

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Type (e.g. serogroup): ☐ Other _____

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or healthcare settings: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or healthcare settings: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Anthrax type:

☐ Cutaneous
☐ Gastrointestinal
☐ Pulmonary

Symptoms:

☐ Abdominal pain
☐ Black eschar (necrotic area)
☐ Chest pain
☐ Chills
☐ Cough
☐ Diarrhea
☐ Edema
☐ Erythema
☐ Fever
☐ Itching
☐ Malaise
☐ Muscle pain
☐ Nausea
☐ Swollen lymph nodes
☐ Shortness of breath
☐ Vomiting
☐ Other _____

Pre-existing wound 7 days prior to onset? ☐ Yes ☐ No ☐ Unk

Wound location: ☐ Head ☐ Trunk ☐ Upper extremity ☐ Lower extremity

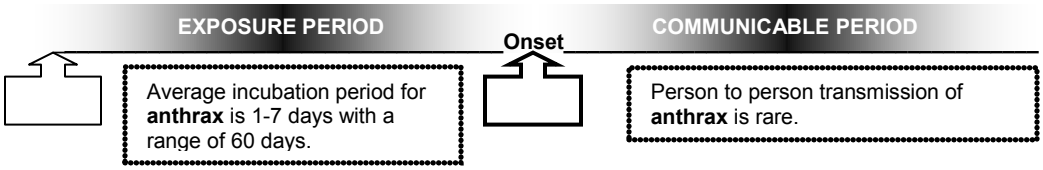
Chest x-ray done? ☐ Yes ☐ No ☐ Unk

Widened mediastynum: ☐ Yes ☐ No ☐ Unk

Date: / / Results: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



OTHER LABORATORY FINDINGS

Biopsy performed?
☐ Yes ☐ No ☐ Unknown Date : / / Site: Result:

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU # of days:	Unit: ☐ mg ☐ ml ☐ IU # of days:	Unit: ☐ mg ☐ ml ☐ IU # of days:
# of times a day: Route:	# of times a day: Route:	# of times a day: Route:

RISK FACTORS/TRAVEL

Vaccinated for anthrax? ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

Number of vaccinations: ____

In the 7 days prior to the onset of the symptoms has the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk City in Iowa: Departure date: / / Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk State: City: Departure date: / / Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk Country: Departure date: / / Return date: / /

Mail handled or opened? ☐ Yes ☐ No ☐ Unk Mail suspicious: ☐ Yes ☐ No ☐ Unk Setting: ☐ Home ☐ School ☐ Work

From date: / / To date: / /

Worked in broadcast or print media? ☐ Yes ☐ No ☐ Unk From date: / / To date: / /

Animal hide, hair, or bone contact? ☐ Yes ☐ No ☐ Unk Animal: ☐ Cattle ☐ Goats ☐ Pigs ☐ Contact type: ☐ Bone ☐ Hide ☐ Deer ☐ Horses ☐ Sheep ☐ Hair ☐ Other

From date: / / To date: / /

Ground meat consumed? ☐ Yes ☐ No ☐ Unknown

Meat fully cooked: ☐ Yes ☐ No ☐ Unknown

Source/type:

Brand name:

From date consumed: / /

To date consumed: / /

Meat other than ground meat consumed? ☐ Yes ☐ No ☐ Unknown

Meat fully cooked: ☐ Yes ☐ No ☐ Unknown

Source/type:

Brand name:

From date consumed: / /

To date consumed: / /

Worked with another case? ☐ Yes ☐ No ☐ Unknown From date: / / To date: / /

Lived with another case? ☐ Yes ☐ No ☐ Unknown From date: / / To date: / /

CONTACTS

Number of people living in case's household: _____ **Others with the same exposures**? ☐ Yes ☐ No ☐ Unknown

Close contacts with the same exposures

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

BOTULISM

Report Immediately by phone

Potential Bioterrorism Agent: Category A

Also known as: *Clostridium botulinum*, *C. botulinum,* intestinal botulism, infant botulism

Responsibilities:
Hospital: Report immediately by phone
Lab: Report immediately by phone
Physician: Report immediately by phone
Local Public Health Agency (LPHA): Report immediately by phone; begin Active Surveillance for additional cases and interview case or family members for possible source.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Botulism is caused by exposure to a neurotoxin produced by *Clostridium botulinum. C. botulinum* is an anaerobic, spore-forming bacterium. The toxin is produced as the bacteria multiply. The bacteria multiply under anaerobic conditions and in an acidic environment (generally pH>4). There are 7 types of botulinum toxin (A-G), but human botulism is caused only by types A, B, E, and F.

Clinical Description

General information: *C. botulinum* toxin is one of the most potent lethal substances known. In humans, botulism manifests itself in one of 4 clinical forms: foodborne botulism, wound botulism, infant (intestinal) botulism and, rarely, adult infectious (intestinal) botulism. The site of toxin production is different in each form, but flaccid paralysis is common to all.

Foodborne botulism is a severe poisoning caused by the ingestion of pre-formed *C. botulinum* toxin.
Symptoms: The clinical syndrome is dominated by neurologic signs and symptoms, including blurred or double vision, dysphagia, dry mouth, and peripheral muscle weakness. Symmetric descending flaccid paralysis is classic diagnostic for botulism. Paralysis begins with the cranial nerves, then affects the upper extremities, respiratory muscles, and finally the lower extremities.

Complications: Patients usually require ventilatory support, which is commonly for 2 - 8 weeks. Clinical manifestations are similar regardless of toxin type, but type A has been associated with a higher case-fatality rate than Type B or Type E. In general, the case-fatality rate for foodborne botulism is 5% - 10%. Recovery may take months.

Wound botulism usually presents with the same clinical picture as foodborne botulism. In wound botulism, the organism multiplies and produces its toxin in the wound. The toxin is absorbed into the bloodstream.

Infant (intestinal) botulism has a distinctly different clinical presentation than wound and foodborne botulism. In infant botulism, the *C. botulinum* spores are ingested, and the toxin is formed

in the intestines in the absence of mature gastrointestinal flora. This disease is usually confined exclusively to infants less than one year of age.

Symptoms: The earliest clinical sign of infant botulism is constipation, followed by poor feeding, decreased sucking, lethargy, listlessness, ptosis (drooping eyelids), difficulty swallowing, a weak cry, and lack of muscle tone--giving rise to the term "floppy baby syndrome."

Complications: Respiratory failure may occur in some cases. Infant botulism presents with a wide range of severity, from mild illness to sudden death. Some studies suggest that infant botulism may be responsible for up to 5% of cases of sudden infant death syndrome (SIDS). Among hospitalized cases in the United States, the case-fatality rate is less than 1%.

Adult infectious (intestinal) botulism occurs as a result of toxin production in the intestines in a manner similar to infant botulism. Most people with adult infectious botulism are found to have suffered from a disruption of their natural intestinal flora due to abdominal surgery, antibiotic treatment, or gastrointestinal tract abnormalities.

B. Reservoirs

C. botulinum spores are ubiquitous in soils worldwide. The spores can survive indefinitely in soil under almost any environmental condition. Spores are also found in marine sediment.

C. Modes of Transmission

Foodborne botulism usually results from ingesting toxin in food that has been inadequately processed or prepared before being eaten. The most frequent source is home-canned foods, but outbreaks have also been attributed to potatoes baked in foil, minced garlic in oil, and sautéed onions held under a layer of butter. Tomato products, once considered low-risk foods because of their low ph, can no longer be dismissed as a potential vehicle. Boiling for ten minutes destroys the toxin.

Wound botulism occurs when wounds are contaminated with dirt or gravel containing botulism spores. Wound botulism has also been reported among chronic drug abusers.

Infant (intestinal) botulism, which is the most common form of botulism in the United States, results from ingestion of bacterial spores, which germinate and produce toxin in the intestines. Botulism can result ingestion of food, soil or dust contaminated with botulinum spores. Honey often contains *C. botulinum* spores. Some cases of infant botulism have occurred in children living in areas of construction and earth disruption.

Adult infectious (intestinal) botulism occurs in a manner similar to infant botulism.

Inhalational botulism can result from inhalation of aerosolized botulism neurotoxin

Iatrogenic botulism can result from accidental injection of botulism neurotoxin into the systemic circulation instead of the intended therapeutic location.

D. Incubation Period

The incubation period is variable.
Foodborne botulism: neurologic symptoms appear within 12 - 36 hours (range: 6 hours to 8 days) after eating contaminated food.

Wound botulism: Median incubation period 7 days, with a range of 4 - 14 days. In general, the shorter the incubation period, the more severe the disease.

Infant botulism: Incubation period is unknown since the date of spore ingestion is usually not known.

Inhalation botulism: Ranges from 12-80 hours after exposure.

E. Period of Communicability or Infectious Period

Person-to-person transmission has not been documented.

F. Epidemiology

Botulism occurs worldwide, as sporadic cases and as family and general outbreaks. In the United States an average of 110 cases of botulism are reported each year. Of these, approximately 25% are foodborne, 72% are infant botulism, and the rest are wound botulism.
A total of 112 laboratory-confirmed cases of botulism were reported to CDC in 2010. Foodborne botulism accounted for 9 (8%), infant botulism for 85 (76%), wound botulism for 17 (15%), and botulism of unknown or other etiology for 1 (<1%) cases. Since 1994, the use of black tar heroin by injection drug users has led to a dramatic increase in the number of cases of wound botulism.

G. Bioterrorism Potential

Category A: *C. botulinum* toxins are considered a potential bioterrorism agent. If acquired and properly disseminated, botulinum toxin could cause a serious public health challenge in terms of ability to limit the numbers of casualties and control other repercussions from such an attack.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To assist in the diagnosis and treatment of potential cases.
- To identify sources of public health concern (*e.g.,* a commercially-distributed food product) and stop transmission from the source.
- To properly classify reported cases as foodborne, infant or wound botulism.
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must immediately report any suspected or confirmed case. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. If you call after business hours, you may call the Iowa State Patrol Office at (515) 323-4360. They will page a member of the on-call CADE staff.

Laboratory Testing Services Available

After communicating with IDPH, contact the University of Iowa State Hygienic Laboratory bacteriology department at (319) 335-4500 for further instructions.

C. Local public health agency (LPHA) and Follow-Up Responsibilities

Case Investigation

a. LPHA should immediately call IDPH Disease Reporting Hotline (800) 362-2738 upon learning of a suspected case of botulism.

b. Case investigation of botulism in Iowa residents will be directed by IDPH Center for Acute Disease Epidemiology (CADE) in collaboration with local and federal agencies.

c. Following notification of IDPH, the LPHA may be asked to assist in investigating any case(s) of botulism. The investigation form is available from the Iowa Disease Surveillance System (IDSS). Use the following guidelines in the investigation:

d. Determine type of botulism: Foodborne botulism is a true medical and public health emergency, and should be investigated as such. Infant and wound botulism do not require the same investigative urgency, so it is essential to determine which illness is occurring.

1) **Foodborne botulism**
The source of exposure and names of all potentially exposed persons must be identified. The case must be interviewed concerning possible food sources. In most cases, information will need to be obtained from family members or other close contacts, since the case's condition will most likely not permit interviewing. Use of IDPH *Enteric Disease Investigation Report* will facilitate recording information pertinent to foodborne transmission. Please contact IDPH Center for Acute Disease Epidemiology for assistance in determining possible food sources. Use the following guidelines to investigate.
   a) Identify all home-canned foods eaten during the week prior to symptoms. The most suspect foods are those eaten less than two days before onset, low in acid, and not eaten by persons who stay well. Keep in mind that some cases may experience less severe symptoms later than the identified case.
   b) Identify all commercially canned foods eaten during the week prior to the onset of illness. For each implicated food, determine and record the brand, manufacturer, package size, lot number, and place and date of purchase.
   c) Identify all sausage and other preserved meats eaten during the week prior to onset of illness. Meat or potato products not adequately refrigerated should also be suspected.
   d) Identify all smoked or otherwise preserved fish eaten during the week before onset of symptoms.
   e) Identify other potentially exposed persons. All persons who have eaten implicated foods must be reached as soon as possible and advised to seek healthcare immediately. Depending on the time of ingestion, other exposed persons might be candidates for purging. At the very least they should be under close medical supervision.
      1. Obtain the name, address, and telephone number of every person who may have eaten the suspected food item.
      2. Obtain the name, address, and telephone number of every person who may have the suspect home-processed food in his or her possession.
   f) Remove implicated food items from the environment for testing. The University of Iowa State Hygienic Laboratory will coordinate testing of food samples.

2) **Wound botulism:** Investigate to determine the cause and do possible traceback.

3) **Infant botulism:** Ask caretakers about honey consumption; otherwise, extensive epidemiological follow-up is not usually required. Prevention education should be provided.

4) **Adult infectious botulism:** As with infant botulism, extensive epidemiological follow-up is not usually required. Prevention education should be provided.

e. **Botulism Testing:** In all cases of suspected botulism, the Center for Acute Disease Epidemiology and the case's healthcare provider determine the appropriateness of botulism testing, based on available clinical and epidemiological data. Arrangements are then made to submit appropriate specimens.

Botulism Antitoxin: Antitoxin therapy is only administered to adult patients with foodborne or wound botulism. Antitoxin is a horse serum product, and may cause serum sickness in approximately 20% of treated persons. Antitoxin is not indicated in cases of infant botulism. The healthcare provider, in consultation with the Center for Acute Disease Epidemiology must determine the need for antitoxin therapy. CDC must release and approve its use. If needed, antitoxin will immediately be flown to the nearest airport. LPHAs should be prepared to assist with logistic arrangements. The decision to administer antitoxin must be made immediately. The longer the wait, the less effective it will be. Testing for the presence of toxin or bacteria in clinical specimens can take many days. The decision to administer antitoxin cannot wait for testing results to confirm the infection. Tests to rule out myasthenia gravis, stroke and Guillain-Barre syndrome should be completed before antitoxin is released by the Centers for Disease Control and Prevention (CDC).

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

No restrictions.

Minimum Period of Quarantine of Contacts

No restrictions.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Any case of botulism is considered an outbreak and must be investigated to determine the source of infection and mode of transmission.

D. Preventive Measures

Personal Preventive Measures/Education

To avoid future exposure, recommend that individuals:

- Learn about the proper time, pressure and temperature required destroying spores if they are interested in home canning and other preservation techniques. More information can be obtained from the Iowa Department of Inspections and Appeals, Food and Consumer Safety Division; US Food and Drug Administration, Center for Food Safety and Applied Nutrition; or Iowa State University Extension's web site http://www.extension.iastate.edu/answerline/
- **Do Not** open bulging containers, or eat, or even "taste-test" foods with "off" odors.
- **Do Not** feed unpasteurized sugar products, such as honey, to children less than one year old.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Botulism can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

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Oregon Health Division. *Investigative Guidelines: Botulism*. Oregon Health Division, November, 1994.

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FACT SHEET BOTULISM

What is botulism?
Botulism is a rare but serious muscle-paralyzing illness caused by a nerve toxin (botulinum toxin) produced by the bacterium *Clostridium botulinum*. There are three forms of the disease–foodborne, infant, and wound botulism.

Who is at risk?
Foodborne botulism can affect anyone who eats food containing the toxin. Infant botulism almost exclusively affects children under 1 year of age, but can rarely affect adults. Wound botulism, although rare, can affect anyone.

How do you get botulism?
Foodborne botulism is acquired by eating foods in which toxin has formed, usually after inadequate heating during canning or cooking at the time they are eaten. Other less common sources of spread have been reported, including mixing minced garlic with oil, improperly handled baked potatoes wrapped in aluminum foil, and home-canning or fermenting fish.

Infant botulism occurs when a baby ingests botulinum spores that then grow in the intestine and produce toxin. Possible sources of spores include foods (especially honey), and dust.

Wound botulism is often acquired from dirt in wounds, but can also be due to injection drug use.

Can botulism be spread from person-to-person?
There have been no reports of person-to-person spread of botulism. Identifying botulism in food is considered a public health emergency because the contaminated food may still be available to infect others besides the person with the disease.

What are the symptoms of botulism?
Symptoms are caused by the toxin, and may include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, and muscle weakness. These symptoms may progress to include paralysis, respiratory failure and death.

Foodborne botulism: symptoms usually appear 12 - 36 hours after eating contaminated food, but they can occur as early as 6 hours or as late as 10 days after the food is eaten.

Wound botulism: symptoms usually appear within 7 days after the bacteria get into the wound, but symptoms can occurred within 4 - 14 days.

Infant botulism: The incubation period is unknown since the date when the baby ingested the spores is usually uncertain.

How is botulism diagnosed?
Foodborne is diagnosed by finding botulinum toxin in blood, stool, stomach contents or food, or by growing *Clostridium botulinum* from stomach contents or stool.

Infant is diagnosed by finding the organisms and/or toxin in patient's stool.

Wound is diagnosed by finding toxin in the patient's blood or by growing the organisms from wound tissue.

How is botulism treated?
Good supportive care in a hospital is the best treatment for all forms of botulism. Specific treatment includes giving botulinum antitoxin. In foodborne botulism, other treatment may be needed, including the removing foods still in the gut by inducing vomiting or using enemas. In wound botulism, the wound is treated, usually with surgery, to remove the source of the bacteria.

How can botulism be prevented?
People who do home canning or other food preservation should learn and use proper canning techniques. People who eat home-canned foods should boil them for at least 10 minutes before eating, to destroy the toxin. Because it can contain spores of *Clostridium botulinum*, and has been a source of infection for infants, honey should not be fed to children less than 12 months old. Honey is safe for persons 1 year of age and older. Wound botulism can be prevented by promptly seeking medical care for infected wounds.

FACT SHEET
For Health Professionals

BOTULISM

What is botulism*?*
Botulism is a rare but serious paralytic illness caused by a potent neurotoxin produced by an anaerobic, spore-forming bacterium (*Clostridium botulinum)*. There are three forms of botulism – foodborne, infant, and wound botulism.

Who is at risk?
Foodborne botulism can affect anyone who eats food that contains the botulinum toxin. Infant botulism almost exclusively affects children under 1 year of age. Intestinal botulism may rarely affect adults. Wound botulism, although rare, can affect anyone.

How is botulism spread?
Foodborne botulism is acquired by ingestion of foods in which toxin has been formed, predominantly after inadequate heating during canning or subsequent inadequate cooking (of the canned foods). Other less common sources of infection have been reported, including minced garlic in oil, improperly handled baked potatoes wrapped in aluminum foil, and home-canned or fermented fish.

Infant botulism is acquired by ingestion of botulinum spores which grow in the intestine and produce toxin. Possible sources of spores include foods (especially honey), and dust.

Wound botulism is often acquired from contamination of wounds or from improperly treated compound fractures. Injection drug users are at increased risk for wound botulism. Wound botulism from the use of black-tar heroin has increased, especially in California.

What are the symptoms of botulism?
Symptoms are due to the paralyzing effect of the toxin on the cranial nerves, and may include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, and muscle weakness, with progression to paralysis, respiratory failure, and death. Incubation periods for each form of botulism are:

Foodborne: Symptoms usually appear within 12 - 36 hours after eating contaminated food, ranging 6 hours to 10 days.

Wound: Symptoms usually appear within 7 days after introduction of the bacteria, ranging 4 - 14 days.

Infant: Incubation period is unknown since it is usually not known when the spores were ingested.

Can botulism be spread?
There have been no reports of person-to-person spread. Botulism is considered a public health emergency, and the source, particularly if it is foodborne, must be identified.

How is botulism diagnosed?
Physicians may consider a diagnosis of botulism if the patient's history and physical examination suggest the disease, but these clues are often not enough to allow a diagnosis. Physicians may confirm diagnosis by:

Foodborne: Diagnosed by presence of botulinum toxin in serum, stool, gastric aspirate or incriminated food; or by culture of *Clostridium botulinum* from gastric aspirate or stool in a clinical case.

Infant: Diagnosed by presence of *Clostridium botulinum* organisms and/or toxin in patient's feces or in autopsy specimens.

Wound: Diagnosed by presence of toxin in serum or by culture of *Clostridium botulinum* from the wound.

How is botulism treated?
Specific treatment includes intravenous administration of tri-valent (ABE) botulinum antitoxin, available through the Centers for Disease Control and Prevention (CDC). The Iowa Department of Public Health is available 24 hours a day at (800) 362-2736 to facilitate shipment of the antitoxin. Antitoxin is not used in infants because of the hazard of sensitization and anaphylaxis. Serum should be collected to identify the specific toxin before antitoxin is administered, but antitoxin should not be withheld pending test results. Immediate access to an intensive care unit is critical so that respiratory failure, the usual cause of death, can be anticipated and managed promptly. The decision to administer antitoxin to asymptomatic persons should be weighed carefully, balancing the potential protection when antitoxin is administered within 1 - 2 days after eating the implicated food against the risk of adverse reaction and sensitization to the horse serum from which the antitoxin is derived. In foodborne botulism, other treatment may be warranted, including the removal of contaminated foods still in the gut by induction of vomiting or use of enemas. In wound botulism, the wound should be thoroughly cleansed and debrided, usually surgically. Tests to rule out myasthenia gravis, stroke, and Guillain-Barre syndrome should be completed before antitoxin is released by CDC.

How can botulism be prevented?
People who do home canning and use other food-preservation techniques should follow strict hygienic practices and observe proper canning techniques. Those eating home-canned foods should boil them for at least 10 minutes before eating to destroy the toxin. Because it can contain spores of *Clostridium botulinum,* honey should not be fed to children less than 12 months old. Wound botulism can be prevented by promptly seeking medical care for infected wounds, and not using injectable street drugs.

Botulism

Agency: _____ Investigator: _____ Phone number: _____

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: _____ First and middle name: _____
Maiden name: _____ Suffix: _____
Address line: _____
Zip: _____ City: _____
State: _____ County: _____
Phone: (___)___-____ Type: _____
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: _____

Date of Birth: __/__/__ Estimated? ☐ Age: _____
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: __/__/__
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: _____
Parent/Guardian phone: (___)___-____ Type: _____

EVENT

Disease type Foodborne ☐ Wound ☐ Infant ☐ Adult intestinal toxemia ☐
Diagnosis date: __/__/__ Onset date: __/__/__
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of death __/__/__
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: _____
Exposure setting: _____
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: _____ Country: _____

Healthcare provider information

Last name: _____
First name: _____
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: _____
Address line 1: _____
Address line 2: _____
Zip code: _____ City: _____
State: _____ County: _____
Phone : (___)___-____ Type: _____

LABORATORY FINDINGS

Laboratory: _____ Accession #: _____ Collection date: __/__/__
Date received: __/__/__ Specimen source: _____ Test type: _____
Result type: ☐ Preliminary ☐ Final Result date: __/__/__ Result: ☐ Positive ☐ Negative
Organism: Toxin Type: ☐ A ☐ B ☐ Other _____

Laboratory: _____ Accession #: _____ Collection date: __/__/__
Date received: __/__/__ Specimen source: _____ Test type: _____
Result type: ☐ Preliminary ☐ Final Result date: __/__/__ Result: ☐ Positive ☐ Negative
Organism: Toxin Type: ☐ A ☐ B ☐ E ☐ F ☐ Other _____

Laboratory: _____ Accession #: _____ Collection date: __/__/__

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Toxin Type: ☐ A ☐ E ☐ B ☐ F ☐ Other

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:

Date worked from: / / Address:

Date worked to: / / Zip code:

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown Health care worker type:

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:

Date worked from: / / Address:

Date worked to: / / Zip code:

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Admission date: / / Discharge date: / / Days hospitalized:

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms:

☐ Abdominal cramps
☐ Blurred vision
☐ Constipation
☐ Diarrhea
☐ Diplopia (double vision)
☐ Dizziness
☐ Dry Mouth
☐ Erythema
☐ Fever
☐ Slurred Speech
☐ Vomiting

Preexisting wound 14 prior to onset? ☐ Yes ☐ No ☐ Unk

Wound location:
☐ Head
☐ Trunk
☐ Upper extremity
☐ Lower extremity

Wound type:
☐ Abrasion
☐ Avulsion
☐ Burn
☐ Compound fracture
☐ Crush
☐ Frostbite
☐ Linear laceration
☐ Puncture
☐ Stellate laceration

Wound depth:
☐ 1 cm or less ☐ >1 cm

Signs of infection:
☐ Yes ☐ No ☐ Unk

Contaminated:
☐ Yes ☐ No ☐ Unknown

Devitalized, ischemic, or denervated tissue:
☐ Yes ☐ No ☐ Unknown

Date wound occurred: / /

Setting:
☐ Automobile
☐ Farm/yard
☐ Petting Zoo
☐ Work
☐ Other

☐ Home

Other wound details:

Botox injections 14 days prior to symptoms? ☐ Yes ☐ No ☐ Unknown
(If Yes, complete the following section. If No, skip to the next section.)

Injection date: / / Facility name: Provider name:

Address: City: State: Zip:

County: Phone: ( )- - Type:

Tensilon test performed: ☐ Yes ☐ No ☐ Unk Date: / / **Results:** ☐ Positive ☐ Negative ☐ Equivocal ☐ Unknown

EMG test performed: ☐ Yes ☐ No ☐ Unk Date: / / **Compatible with Botulism diagnosis?** ☐ Yes ☐ No ☐ Unk

OTHER LAB FINDINGS

Food, medication or environmental samples tested? ☐ Yes ☐ No ☐ Unknown
(If Yes, complete the following section. If No, then skip to the next section.)

Tested for preformed toxin: ☐ Yes ☐ No ☐ Unk Laboratory: Toxin type: ☐ A ☐ B ☐ E ☐ F ☐ G

Describe samples: List positive samples:

Tested for C. botulinum or other serotype: ☐ Yes ☐ No ☐ Unk Laboratory:

Describe samples: List positive samples:

TREATMENT

For the illness, were any of the following treatments required:

Tracheotomy: ☐ Yes ☐ No ☐ Unk **Ventilator:** ☐ Yes ☐ No ☐ Unk Duration in days:

Antitoxins prescribed? ☐ Yes ☐ No ☐ Unk **Therapeutic medications prescribed?** ☐ Yes ☐ No ☐ Unk

Date started: List medications:

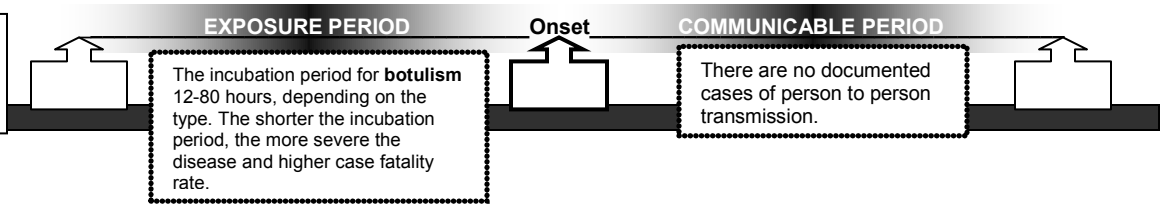
Dose: Unit:

days: # times each day:

Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



In the 36 hours prior to onset of symptoms did the case consume:

Home canned foods: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Fish: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Meat other than fish: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types:		List all brand names:		
Potato or potato products:	☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	
List all source/types:		List all brand names:		
Describe preparation:				
Other root vegetable:	☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	
List all source/types:		List all brand names:		

In the 14 days prior to symptoms did the case Inject street drugs or steroids? ☐ Yes ☐ No ☐ Unknown

CONTACTS

Contacts with the same exposures ☐ Yes ☐ No ☐ Unknown

Name	**DOB**	**Gender**	**Address/Phone**	
	/ /	☐ Male ☐ Female		
			Zip code:	Phone: - -

Relationship to case:		**List symptoms**	**Symptom onset date**	**Same foods consumed?**	**Is contact a case?**
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	**DOB**	**Gender**	**Address/Phone**	
	/ /	☐ Male ☐ Female		
			Zip code:	Phone: - -

Relationship to case:		**List symptoms**	**Symptom onset date**	**Same foods consumed?**	**Is contact a case?**
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	**DOB**	**Gender**	**Address/Phone**	
	/ /	☐ Male ☐ Female		
			Zip code:	Phone: - -

Relationship to case:		**List symptoms**	**Symptom onset date**	**Same foods consumed?**	**Is contact a case?**
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	**DOB**	**Gender**	**Address/Phone**	
	/ /	☐ Male ☐ Female		
			Zip code:	Phone: - -

Relationship to case:		**List symptoms**	**Symptom onset date**	**Same foods consumed?**	**Is contact a case?**
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

CONFIDENTIAL

Iowa Department of Public Health

Infant Botulism

Agency:

Investigator:

Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:

First and middle name:

Maiden name: Suffix:

Address line:

Zip: City:

State: County:

Phone: ( )- - Type:

Long-term care resident: ☐ Yes ☐ No ☐ Unknown

Facility name:

Date of Birth: / / Estimated? ☐ Age:

Gender: ☐ Female ☐ Male ☐ Other

Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed

Race: ☐ American Indian or Alaskan Native ☐ Asian ☐ Black or African American ☐ Unknown ☐ Hawaiian or Pacific Islander ☐ White

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Parent/Guardian name:

Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name:

Exposure setting:

Epi-linked: ☐ Yes ☐ No ☐ Unknown

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: Country:

Healthcare provider information

Last name:

First name:

Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA

Facility name:

Address line 1:

Address line 2:

Zip code: City:

State: County:

Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Toxin Type: ☐ A ☐ B ☐ Other

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Toxin Type: ☐ A ☐ B ☐ E ☐ F ☐ Other

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Toxin Type: ☐ A ☐ B ☐ E ☐ F ☐ Other

Child Care

Is the case attending a child care facility? ☐ Yes ☐ No ☐ Unknown
(If yes, complete the following sections for each known occupation. If No, skip to the next section.)

Date attend from: / / Facility name:
Date attended to: / / Address:
Zip code:
City:
Phone: ( )- - Type:

Date attend from: / / Facility name:
Date attended to: / / Address:
Zip code:
City: State: County:
Phone: ( )- - Type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):
Admission date: / / Discharge date: / / Days hospitalized:
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

OTHER DEMOGRAPHIC INFORMATION

Father's age in years: Education: ☐ Grade school ☐ Middle school ☐ High school ☐ Vocational/trade school ☐ Associate's degree ☐ Bachelor's degree or higher

Occupation:
☐ ~~Student – child care/preschool~~
☐ Student-elementary thru high school
☐ Student-post high school, college, etc
☐ Child (0-18 yrs) not attending school/day care
☐ Child care provider/worker, other work with children
☐ Teacher/staff – preschool
☐ Teacher/staff – elementary/high school
☐ Teacher/staff – post high school, college, etc
☐ Healthcare worker/staff
☐ Resident – long term care facility
☐ Worker- farming
☐ Worker – manufacturing/industrial
☐ Worker – Sales/retail
☐ Worker – transportation
☐ Worker - business
☐ Worker – food service
☐ Worker – non manufacturing/service
☐ Worker - other
☐ Retired
☐ Works at home/stay at home parent
☐ Unemployed
☐ Other adult
☐ Unknown, adult (19 yrs or older)

Mother's age in years: Education: ☐ Grade school ☐ Middle school ☐ High school ☐ Vocational/trade school ☐ Associate's degree ☐ Bachelor's degree or higher

Occupation:
☐ ~~Student – child care/preschool~~
☐ Student-elementary thru high school
☐ Student-post high school, college, etc
☐ Child (0-18 yrs) not attending school/day care
☐ Child care provider/worker, other work with children
☐ Teacher/staff – preschool
☐ Teacher/staff – elementary/high school
☐ Teacher/staff – post high school, college, etc
☐ Healthcare worker/staff
☐ Resident – long term care facility
☐ Worker- farming
☐ Worker – manufacturing/industrial
☐ Worker – Sales/retail
☐ Worker – transportation
☐ Worker - business
☐ Worker – food service
☐ Worker – non manufacturing/service
☐ Worker - other
☐ Retired
☐ Works at home/stay at home parent
☐ Unemployed
☐ Other adult
☐ Unknown, adult (19 yrs or older)

Number of pregnancies: Number of live births:

For this birth:

Delivery type: ☐ C-section ☐ Vaginal Complications: ☐ Yes ☐ No ☐ Unknown

Describe complications:

Premature? ☐ Yes ☐ No ☐ Unknown Gestational age in weeks: Birth weight/units: Unit: ☐ Pounds/ounces ☐ Kilograms ☐ Grams

CLINICAL INFO & DIAGNOSIS

Interviewee: ☐ Father ☐ Mother ☐ Both ☐ Other _____

For the period from birth to the onset of symptoms:

Fever (>101°F) ☐ Yes ☐ No ☐ Unknown Onset Date: ___/___/___ Describe frequency: _____

Highest known fever: _____ °C or °F Date of highest fever: ___/___/___

Cold ☐ Yes ☐ No ☐ Unknown Onset Date: ___/___/___ Describe frequency: _____

Constipation ☐ Yes ☐ No ☐ Unknown Onset Date: ___/___/___ Describe frequency: _____

Diarrhea ☐ Yes ☐ No ☐ Unknown Onset Date: ___/___/___ Describe frequency: _____

Frequency of bowel movements: ☐ 2 or more per day ☐ Every other day ☐ 1 per week ☐ 1 per day ☐ 2-3 times per week ☐ Less than 1 per week

For the period after the onset of symptoms:

Constipation: Onset Date: ___/___/___

Poor eating: Onset Date: ___/___/___

Altered cry: Onset Date: ___/___/___

Poor head control: Onset Date: ___/___/___

General weakness: Onset Date: ___/___/___

First Symptom: ☐ Altered cry ☐ Cold ☐ Constipation ☐ Diarrhea ☐ Fever ☐ General weakness ☐ Poor feeding ☐ Poor head control

Second Symptom: ☐ Altered cry ☐ Cold ☐ Constipation ☐ Diarrhea ☐ Fever ☐ General weakness ☐ Poor feeding ☐ Poor head control

Bowel movement frequency: ☐ 2 or more per day ☐ 1 per day ☐ Every other day ☐ 2-3 times per week ☐ 1 per week ☐ Less than 1 per week

Health care provider visited? ☐ **Yes** ☐ **No** ☐ **Unknown**

Dates visited: ___/___/___, ___/___/___

Facility name: _____

Address line 1: _____

Address line 2: _____

Zip code: _____

State: _____ City:

Phone : ( )- - County:

Last name: Type:

First name:

Provider title: ☐ ARNP ☐ DO

Spinal tap performed? ☐ Yes ☐ No ☐ Unknown

Date: ___/___/___

Normal: ☐ Yes ☐ No ☐ Unk

Spinal fluid protein: ☐ in (unit of measure) ☐ mg/dL ☐ g/L ☐ µmol/L

Spinal fluid glucose: ☐ in (unit of measure) ☐ mg/dL ☐ µmol/L

WBC count: ☐ in (unit of measure) ☐ cells / mm3 ☐ cells/mL

OTHER LAB FINDINGS

Food, medication or environmental samples tested? ☐ Yes ☐ No ☐ Unknown

(If Yes, complete the following section. If No, then skip to the next section.)

Tested for preformed toxin: ☐ Yes ☐ No ☐ Unk Laboratory: _____ Toxin type: ☐ A ☐ B ☐ E ☐ F ☐ G

Describe samples: _____ List positive samples: _____

Tested for C. botulinum or other serotype: ☐ Yes ☐ No ☐ Unk Laboratory: _____

Describe samples: _____ List positive samples: _____

TREATMENT

For the illness, were any of the following treatments required:

Oxygen: ☐ Yes ☐ No ☐ Unk **Ventilator:** ☐ Yes ☐ No ☐ Unk Duration in days: _____

Tracheotomy: ☐ Yes ☐ No ☐ Unk **Intubation:** ☐ Yes ☐ No ☐ Unk Duration in days: _____

Feeding tube: ☐ Yes ☐ No ☐ Unk Duration in days:

Botulism immune globulin (BIG) prescribed? ☐ Yes ☐ No ☐ Unk **Therapeutic medications prescribed?** ☐ Yes ☐ No ☐ Unk

Date started: _____ List medications: _____

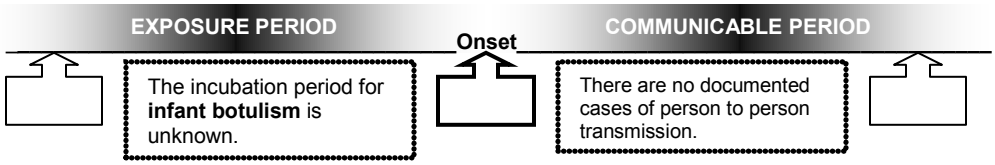
Dose: _____ Unit: _____

Number of days: _____ Number of times each day: _____

Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Primary feeding method: ☐ Breastfed exclusively ☐ Predominantly breastfed ☐ Both equally ☐ Formula fed exclusively ☐ Predominantly formula fed

Pacifier use: ☐ Yes ☐ No ☐ Unk Frequency: ☐ Often ☐ Sometimes ☐ Rarely

Pacifier dipped in substance: ☐ Yes ☐ No ☐ Unk Substance: ☐ Honey ☐ Syrup

Environmental change or disruption prior to onset: ☐ Yes ☐ No ☐ Unk

Describe environmental change/disruption: _____

Gardening work near infant prior to onset: ☐ Yes ☐ No ☐ Unk

Describe work: _____

Infant away from home more than 1 week prior to onset: ☐ Yes ☐ No ☐ Unk

Describe circumstances: _____

Dietary Information – *in the time period from birth to onset of symptoms:*

Infant formula: ☐ Yes ☐ No ☐ Unknown

Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days

Formula brand: ☐ Enfamil ☐ Good start ☐ Similac ☐ Store brand ☐ Other _____

Ready to eat formula: ☐ Yes ☐ No ☐ Unk

Cow's milk: ☐ Yes ☐ No ☐ Unknown

Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Cow's milk products (cheese, whip cream, etc.): ☐ Yes ☐ No ☐ Unknown

Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Fruit juice: ☐ Yes ☐ No ☐ Unknown

Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Cereal: ☐ Yes ☐ No ☐ Unknown

Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Bread: ☐ Yes ☐ No ☐ Unknown

Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Syrup: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Honey: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Sugar: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Tea: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Cooked fruits: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Raw fruits: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Cooked vegetables: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Raw vegetables: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Home canned food: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

Baby food: ☐ Yes ☐ No ☐ Unknown
Frequency: ☐ Once/few times ☐ Many times ☐ Daily/most days Source/type: _____ Brand name: _____

NOTES:

BRUCELLOSIS

Report Immediately by phone
If bioterrorism suspected

Potential Bioterrorism Agent: Category B

Also known as: Undulant Fever, Malta Fever, Mediterranean Fever

Responsibilities:
Hospital: Report immediately by phone if bioterrorism suspected, otherwise within 3 days
Lab: Report immediately by phone if bioterrorism suspected, otherwise within 3 days
Physician: Report immediately by phone if bioterrorism suspected, otherwise within 3 days
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Brucellosis is caused by *Brucella* bacteria. The species of *Brucella* which infect humans are *B. abortus, B. melitensis, B. suis*, and rarely*, B. canis.*

B. Clinical Description

Symptoms: May be non-specific, including sustained or irregular fever of variable duration, headache, weakness, sweats, chills, arthralgias, malaise, weight loss, depression and generalized aching.

Onset: May be acute or insidious. Localized infections of organs (including the liver and spleen) and chronic localized infections can occur. The disease may last for days, months, or occasionally longer if inadequately treated. Relapse is not uncommon.

Complications: Most commonly include osteomyelitis, splenic abscess, genitourinary tract infection, pulmonary disease, and endocarditis. The case-fatality rate of untreated brucellosis is 2% or less with death often resulting from endocarditis caused by *Brucella melitensis*.

C. Reservoirs

Common reservoirs: Cattle (*B. abortus*), swine (*B. suis*), goats (*B. melitensis*) and sheep.

Less common reservoirs: Bison, elk, coyotes, caribou, and some species of deer may also harbor *Brucella* species. *B. canis* is an occasional problem in laboratory dog colonies and kennels; a small percentage of pet dogs and a higher proportion of stray dogs have *B. canis* antibody titers.

D. Modes of Transmission

Spread through direct contact (of mucosal surfaces and non-intact skin) with secretions of living or dead infected animals, including their tissues, blood, urine, vaginal discharges, aborted fetuses, and especially placentas. It may also be spread through ingestion of raw milk and dairy products (*e.g.,* unpasteurized cheese) from infected animals.

Airborne transmission may occur through inhalation of contaminated aerosols (*e.g.,* in laboratory settings).

Transmission from strain 19 *Brucella* animal vaccine or Rev-1 animal vaccine may occur in veterinary practices and associated personnel and farmers.

Person-to-person spread is extremely rare, although it has been reported to occur through bone-marrow transplantation.

E. Incubation period

The incubation period for brucellosis is highly variable, ranging from 5 - 60 days; illness most commonly occurs about 1-2 months after exposure.

F. Period of Communicability or Infectious Period

Person-to-person transmission of brucellosis is extremely rare.

G. Epidemiology

- Humans are accidental hosts, although there is worldwide distribution of brucellosis.
- Commonly seen in farmers, ranchers, veterinarians, and other people who work directly with animals. It may also be found in laboratory and slaughterhouse employees, or meat inspectors.
- Sporadic cases and outbreaks, especially among overseas travelers may occur among consumers of raw (unpasteurized) milk and milk products, especially soft cheeses. Less than 10% of reported cases occur in children under 19 years old. Fewer than 120 cases per year are reported in the United States; incidence worldwide may be largely unrecognized and under reported.

H. Bioterrorism Potential

Category B: *Brucella* species are considered potential bioterrorism agent. If acquired and properly disseminated, *Brucella* could cause a serious public health challenge in ability to limit the numbers of casualties and control other repercussions from such an attack.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify the source of infection and prevent further transmission from this source (*e.g.,* an infected animal, a contaminated unpasteurized dairy product, etc.).
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is through the Iowa Disease Surveillance System, unless Bioterrorism is involved. The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Note: Due to the infrequent occurrence and potential severity of brucellosis, IDPH requests that information about any suspect or known case be reported within 24 hours, however any suspected exposure to *Brucella* that may be bioterrorist in nature should be **immediately reported** to the

local public health agency where diagnosed. If this is not possible, call IDPH Center for Acute Disease Epidemiology at (800) 362-2736.

C. Local Public Health Agency (LPHA) Follow-up Responsibilities

1. Case Investigation

a) The most important thing a LPHA can do if it learns of a suspect or confirmed case of brucellosis, or any suspected exposure to *Brucella* that may be due to a bioterrorist event, is to call IDPH immediately, any time of the day or night. The 24-hour number for the Center of Acute Disease Epidemiology is (800) 362-2736.

b) Case investigation of brucellosis in Iowa residents will be directed by CADE. If a bioterrorist event is suspected, IDPH and other response authorities will work closely with LPHA(s) and provide instructions/information on how to proceed.

c) Following immediate notification to IDPH, the LPHA(s) may be asked to assist in investigating cases that live within their community. They may be asked to:

1) Confirm diagnosis.
2) Inform CADE of the presence of the disease and request assistance if needed.
3) Work with CADE staff on completion of CDC *Brucellosis Case Surveillance form.*
4) Confirm that the laboratory where the culture was identified exercised the proper precautions when working with the bacteria. Infectious aerosols can occur when manipulation of the isolate is done outside of a biosafety hood. Laboratory workers exposed to these aerosols should take preventive antibiotics.
5) Ask questions regarding exposure to the *Brucella* vaccine to determine other potential sources of exposure.

If it is suspected that the case became infected through milk (or other food), CADE will work with the Department of Inspections and Appeals (DIA) to address food safety concerns.

d) Institution of disease control measures is an integral part of case investigation. The LPHA will work with CADE to institute the control guidelines listed below in Section 4), Controlling Further Spread. CADE staff will also be available to assist in development of any risk communications or other needs of its local partners regarding the investigation.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Isolation: Standard Precautions.
Quarantine: None.

B. Protection of Contacts of a Case

- Follow Standard and Contact Precautions if the case has draining lesions followed by disinfection of purulent discharges.
- Licensed *Brucella* vaccines are currently available only for livestock.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If more than one case of brucellosis is reported or suspected, or an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle, such as unpasteurized milk products or infected animals, should be sought and applicable preventive or control measures should be instituted (e.g., removing an implicated food item from the environment). Consult with an epidemiologist at CADE at (800) 362-2736 as soon as possible. The center can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross county lines and be difficult to identify.

Exposure of a Laboratory Worker

Laboratory workers exposed to *Brucella* (*e.g.,* failure to use the protection of a laminar air flow/biosafety hood), should receive prophylaxis consisting of:

- Doxycycline 100 mg bid plus rifampin 600-900 mg once daily for 21 days; for conjunctiva inoculations, prophylaxis should be maintained for 4 - 6 weeks. Consult with an epidemiologist at CADE at (800) 362-2736.

Inadvertent inoculation with *Brucella* animal vaccine

Veterinarian and others in veterinary practices, farmers and others exposed to *Brucella* animal vaccine should receive prophylaxis consisting of:

- Doxycycline 100 mg bid for 21 days; for conjunctiva inoculations, prophylaxis should be maintained for 4 - 6 weeks.
- Consult with an epidemiologist at CADE at (800) 362-2736.

D. Preventive Measures

- Pasteurize milk and dairy products.

Environmental Measures

Implicated food items must be removed from the environment. A decision about removing these can be made in consultation with the Department of Inspections and Appeals and CADE officials.

Preventive Measures/Education

To prevent future exposures, advise the following:

- Do not consume raw (unpasteurized) milk or milk products (including imported cheeses, etc.).
- Workers at occupational risk (farmers, slaughterhouse workers, meat processors or butchers) should know symptoms of the disease, how it is spread, and the risks of handling infected animal carcasses and products. They should know the proper way to reduce exposure, such as ventilating slaughterhouses and handling carcasses carefully. For more information refer to the USDA, Animal and Plant Health Inspection Service (APHIS) web site, www.aphis.usda.gov/
- Hunters should use barrier protection (gloves or clothing) when dressing wild pigs and burying the remains.
- Wear gloves and protect skin from secretions or excretions when handling and disposing of placenta, discharges, and fetus from an aborted animal. Disinfect contaminated areas.

Local officials and farmers should search for infection among livestock and eliminate infected animals. In areas of high prevalence, immunization of livestock may be appropriate. Ultimate control of human brucellosis relies on eliminating the disease in domestic animal populations.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for brucellosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Contact the Iowa Department of Agriculture and Land Stewardship (IDALS), (515) 281-8601 (after hours 515-242-0247) with questions about the disease in animals. For information about the risk to humans, contact CADE at (800) 362-2736. If after hours, instructions will be given to reach on-call staff.

References

American Academy of Pediatrics. *2000 Red Book: Report of the Committee on Infectious Diseases, 25h Edition.* Illinois, Academy of Pediatrics, 2000.
CDC web site. Brucellosis. Available at www.cdc.gov/brucellosis/
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Additional Resources

USDA web site providing information regarding brucellosis in animals:
www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/
FDA web site providing the latest food recalls:
www.fda.gov/opacom/7alerts.html

FACT SHEET BRUCELLOSIS

What is brucellosis?
Brucellosis is a disease that affects a wide range of animals. Cattle, sheep, goats, dogs, pigs, horses and humans are susceptible to the bacteria. There are six species of *Brucella,* each infecting a different animal. All are capable of causing disease in humans. The *Brucella* bacteria are found in high numbers in animal secretions, the reproductive organ tissue of animals, and in aborted fetuses of a diseased female animal.

How is the *Brucella* organism spread?
Human infection can result from direct contact of the organism to mucous membranes such as eyes and lips and openings in the skin (cuts, sores or breaks in the intact surface of the skin); drinking unpasteurized milk from an infected animal; or by breathing in the bacteria if it is released in the air by accident or on purpose. Person-to-person transmission is rare.

What are the clinical signs of infection?
Most animals are ill with reproductive problems including abortions and uterine or testicular infections. Humans at high risk for exposure to animal infection with *Brucella* include: farmers, packing plant workers, veterinarians, and animal care professionals. Signs of infection with the bacteria include: recurrent fever, muscle aches, weight loss, and headaches. The disease is often called undulant fever in humans. A detailed history of exposure to possibly infected animals is the key to diagnosing this disease.

How can brucellosis be diagnosed?
Laboratory testing to screen for the bacteria is performed on all milk and dairy products commercially produced in the United States. Tests are also routinely performed on animal blood after slaughter. Positive laboratory results need to be reported to the state veterinarian.

Can *Brucella* infections be treated?
Yes, these infections can be treated with antibiotics, if the disease is identified early in its course.

How can *Brucella* infection be prevented?
Stopping the disease in domestic animals is the best defense against infection. Due to national efforts to eliminate brucellosis from animal herds, any animals that test positive are removed from the food chain to break the cycle of infection. Bulk tank milk is tested to identify and eliminate infected herds. All dairy cows are vaccinated against brucellosis at approximately 2 months of age. Humans, especially pregnant women, should not consume raw milk or eat cheese made from unpasteurized milk.

FACT SHEET BRUCELLOSIS

Information for Health Professionals

What is brucellosis?

Brucellosis is a systemic bacterial infectious disease caused by the bacterium *Brucella abortus*,*B. melitensis*, *B. suis*, and *B. canis*. Although brucellosis infection has a low mortality rate, it can be an incapacitating and disabling disease in its natural form.

How is the disease transmitted?

Cattle, swine, goats and sheep are the primary reservoirs. Brucellosis is transmitted by contact with tissues, blood, urine, vaginal discharges, aborted fetuses and placentas; and by ingestion of raw milk and unpasteurized dairy products from infected animals. Airborne infection of humans occurs in laboratories and meat packing plants. Person-to-person transmission is rare. The incubation period is usually 5 - 60 days.

What are the symptoms of brucellosis?

Brucellosis may present as a non-specific febrile illness with fever, headache, myalgia, arthralgia, back pain, sweats, chills, and generalized weakness and malaise as common complaints. Cough and pleuritic chest pain may occur in up to 20% of cases. Gastrointestinal symptoms occur in up to 70% of adult cases. Hepatomegaly and splenomegaly can occur in up to 60% of cases. Osteoarticular complications, including sacroiliities, are seen in 20% - 60% of cases. Genitourinary involvement and skin rashes are reported with lesser frequency. The case-fatality rate of untreated brucellosis is < 2% and usually results from endocarditis. Rarely, patients may exhibit a draining fistula from an infection that occurred several years earlier.

How is the diagnosis made?

Chest x-ray may be normal, or it may show lung abscesses, bronchopneumonia, enlarged hilar lymph nodes, and pleural effusions. Vertebral involvement may be demonstrated by plan radiographs, CT scan or MRI. Bone scans are 90% sensitive for detecting sacroiliitis. Peripheral joint effusions usually show mononuclear cell predominance. Culture of joint effusions or CSF has sensitivity of 50%. Cultures of blood and bone marrow during the acute febrile phase are up to 70% - 90% positive respectively. *Brucella* antibodies can be demonstrated by serum agglutination and ELISA tests.

What is the treatment for brucellosis?

Doxycycline 200 mg/day orally plus rifampin 600-900 mg/day for a minimum of 6 weeks. Ofloxacin 400 mg/day and rifampin 600 mg/day orally is also an effective combination. Combination therapy with rifampin, tetracycline, and an aminoglycoside is indicated for infections with complications such as meningoencephalitis or endocarditis.

What are the isolation precautions for brucellosis?

Healthcare workers should use standard precautions when caring for persons with brucellosis.

Is there prophylactic treatment after exposure?

Although efficacy has not been demonstrated in clinical trials, it is recommended that people inadvertently inoculated with Strain 19 or Rev-1 animal vaccines be given doxycycline 100mg twice daily, combined with rifampin 600-900mg once daily for 21 days; for conjunctiva inoculations, prophylaxis should be maintained for 4 - 6 weeks. Prophylaxis for exposure to RB51 vaccine strain would exclude rifampin because the organism was developed in rifampin media and is resistant in vitro.

FACT SHEET BRUCELLOSIS

Veterinary

What is brucellosis?
Brucellosis is a disease that affects a wide range of animals. Cattle, sheep, goats, dogs, pigs, horses and humans are susceptible to the bacteria. There are six species of *Brucella,* each infecting a different animal.

How is the *Brucella* organism spread?
The bacteria are found in high numbers in reproductive tissue, infected calves, placentas, blood or amniotic fluid of infected females. The organism can be spread by direct contact to non-intact skin, ingestion through milk, or inhalation of this material. The bacteria then localize in the reticuloendothelial system and in the chorioendothelial layer of the placenta in cattle.

What are the clinical signs of infection?
The disease manifests in a variety of ways, depending on the sex and species of animals and the species of *Brucella*. *Brucella abortus* produces abortion and metritis in cows and an epididymo-orchitis in bulls. *Brucella ovis* in sheep primarily affects the male reproductive tract. Horses infected with *Brucella suis* present with a chronic suppurative reaction in the neck called fistulous withers. *Brucella* in dogs and pigs localize to the vertebra and produce an osteomyelitis and/or diskospondylitis.

How is brucellosis diagnosed?
Worldwide, serology screening tests are performed on milk using agglutination techniques like the milk-ring assay. Tests on blood, including immunofluorescence and ELISA, can be used as well as culture of infected placental or fetal tissues. Positive laboratory results should be reported to the state veterinarian.

Can *Brucella* infections be treated or prevented?
As part of national efforts to eliminate brucellosis from herds, positive animals are removed from the food chain to break the cycle of infection. Bulk tank milk is screened with the milk-ring test to identify and eliminate reactor herds. All dairy cows are inoculated with a live attenuated vaccine, RB51, at approximately 2 months of age.

What are the risks to veterinarians, farmers, and animal health professionals?
Infection with *Brucella abortus* in humans produces a condition called undulant fever. Symptoms include a high fever, headache, and weakness and can be treated with tetracycline antibiotics. Women affected by *Brucella* while pregnant can abort and men can present with epididymitis. Direct contact with aborted fetuses, affected calves, and reproductive tissue, as well as accidental inoculation with the vaccine, can result in infection.

Is there prophylactic treatment after exposure?
While efficacy has not been demonstrated in clinical trials, it is recommended that people inadvertently inoculated with Strain 19 or Rev-1 animal vaccines be given doxycycline 100mg twice daily, combined with rifampin 600-900mg once daily for 21 days; for conjunctiva inoculations, prophylaxis should be maintained for 4 - 6 weeks. Prophylaxis for exposure to RB51 vaccine strain would exclude rifampin because the organism was developed in rifampin media and is resistant in vitro. Any suspected accidental or purposeful exposure to animals or humans should be reported immediately to the local public health agency and the Iowa Department of Public Health at (800) 362-2736.

Brucellosis

Agency:

Investigator:

Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Type biovar ☐ Other

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Type biovar ☐ Other

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other _____

Organism: Type biovar

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

Occupation type: Job title:
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:
Date worked from: / / Address:
Date worked to: / / Zip code:
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: Job title:
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:
Date worked from: / / Address:
Date worked to: / / Zip code:
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):
Admission date: / / Discharge date: / / Days hospitalized:
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

Hospital: Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):
Admission date: / / Discharge date: / / Days hospitalized:
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Episode Type:
☐ First attack
☐ Recurrence
☐ Chronic

Episode Severity:
☐ Mild
☐ Moderate
☐ Severe

Symptoms:
☐ Anorexia
☐ Chills
☐ Headache
☐ Muscle Pain
☐ Muscle Weakness
☐ Weight Loss

Date Returned to Normal Activities: / /

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic: Date started: / / Dose:
Antibiotic: Date started: / / Dose:
Antibiotic: Date started: / / Dose:

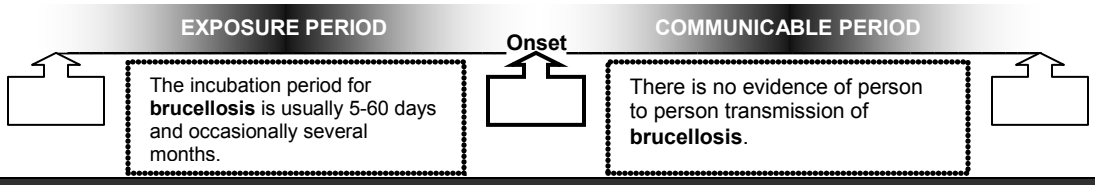
Unit: ☐ mg ☐ ml ☐ IU Number of days: _____ Number of times a day: _____ Route: _____

Unit: ☐ mg ☐ ml ☐ IU Number of days: _____ Number of times a day: _____ Route: _____

Unit: ☐ mg ☐ ml ☐ IU Number of days: _____ Number of times a day: _____ Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

In the 60 days before the onset of symptoms did the case:

Travel within Iowa? ☐ Yes ☐ No ☐ Unk City in Iowa: _____ Departure date: __/__/__ Return date: __/__/__

Travel within U.S.? ☐ Yes ☐ No ☐ Unk State: _____ City: _____ Departure date: __/__/__ Return date: __/__/__

Travel outside U.S.? ☐ Yes ☐ No ☐ Unk Country: _____ Departure date: __/__/__ Return date: __/__/__

Give birth: ☐ Yes ☐ No ☐ Unknown

Have animal contact: ☐ Yes ☐ No ☐ Unknown

Animal type: ☐ Deer ☐ Elks ☐ Horses ☐ Rabbits ☐ Sheep ☐ Dogs ☐ Goats ☐ Pigs ☐ Rats ☐ Other

Were any of these animals birthing: ☐ Yes ☐ No ☐ Unknown

Exposed to potential Infection sources: ☐ Yes ☐ No ☐ Unknown

Check all possible sources: ☐ Aborted animal fetuses or placentas ☐ Laboratory ☐ Livestock Handling ☐ Livestock Vaccine ☐ Packing Plant ☐ Unpasteurized dairy product

CONTACTS

Others with the same exposures? ☐ Yes ☐ No ☐ Unknown

Others with the same exposures

Name	DOB	Gender	Address/Phone
	__/__/__	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		__/__/__	☐ Yes ☐ No
☐ Child	☐ Family member (non-household)			
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	__/__/__	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		__/__/__	☐ Yes ☐ No
☐ Child	☐ Family member (non-household)			
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

Diseases C-D

CAMPYLOBACTERIOSIS

Also known as: *Campylobacter* enteritis, Vibrionic enteritis

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physician: Report by IDSS, facsimile, mail or phone
Local Public Health Agency (LPHA): No follow-up required, except in outbreak situations

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Bacteria of the genus *Campylobacter* are responsible for campylobacteriosis. *Campylobacter jejuni* (*C. jejuni*) a species of *Campylobacter* is responsible for about 99% of campylobacteriosis in humans, with the remainder of cases caused by other species.

B. Clinical Description

Symptoms: of campylobacteriosis are diarrhea (sometimes bloody), abdominal pain, malaise, fever, nausea, and sometimes vomiting. Infection can cause a spectrum of disease ranging from mild, uncomplicated gastroenteritis to severe disease similar to acute appendicitis. Asymptomatic infections also occur. The illness is usually over within a week but may be prolonged in some individuals and can sometimes relapse.

Long-term complications: include reactive arthritis and Guillain-Barré syndrome, a rare disease that affects the nerves of the body beginning several weeks after the diarrheal illness. This complication results in paralysis that lasts several weeks and usually requires intensive care. It is estimated that approximately 1 in every 1000 reported campylobacteriosis cases leads to Guillain-Barré syndrome and as many as 40% of Guillain-Barré syndrome cases in this country are triggered by campylobacteriosis.

Campylobacteriosis can cause life-threatening sepsis in persons with compromised immune systems.

C. Reservoirs

Campylobacter bacteria are present in animals, most frequently cattle and poultry, although swine, sheep, and even pets such as birds, kittens and puppies may be sources of human infection. A large percentage of raw poultry is contaminated with *C. jejuni*.

D. Modes of Transmission

Campylobacter is transmitted via food. The most common mode of transmission is ingestion of food or water that has been contaminated with animal or human feces. This includes raw and undercooked poultry or pork, inadequately treated drinking water, and raw milk and raw milk products. However, any food contaminated with the bacteria can be a source of infection. In addition, farm animals and pets, such as puppies with diarrhea, can be sources of infection. Person-to-person spread can also occasionally occur, especially among household contacts, pre-school children in child care, the elderly and developmentally disabled persons living in residential facilities. Transmission can also occur through certain types of sexual contact (e.g., oral-anal contact). A low dose of organisms is all that is needed to

cause infection, but the infectious dose may be lower for certain susceptible groups such as children, the elderly and the immunocompromised.

E. Incubation Period

The incubation period can vary from 1 - 10 days but is usually about 2 - 5 days; incubation period may vary based on number of bacteria ingested.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes *Campylobacter* bacteria in their stool. This can occur from days to several weeks. People who are not given antibiotics have been known to shed these bacteria for as long as 7 weeks.

G. Epidemiology

Campylobacter is the most common bacterial cause of diarrheal illness in the United States. It is estimated that 1.3 million cases occur annually with almost all cases occurring as isolated, sporadic events. Although common source outbreaks due to this organism have occurred, larger outbreaks due to *Campylobacter* are not usually associated with undercooked, pork, poultry and cattle but are typically related to consuming unpasteurized milk, cheese or contaminated water. Outbreaks due to *Campylobacter* are uncommon. Children and young adults have the highest incidence of infection. *Campylobacter* doesn't commonly cause death, however there are an estimated 76 persons with *Campylobacter* infections that die each year.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify transmission sources of major public health concern (e.g., a restaurant or commercially distributed food product) and to stop transmission from such sources.
- To identify whether the case may be a source of infection for other persons (e.g., a diapered child, child care attendee or food handler) and, if so, to prevent further transmission.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is through the Iowa Disease Surveillance System (IDSS). The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) will test stool specimens for the presence of *Campylobacter* and will confirm and speciate isolates sent from clinical specimens at other laboratories. Additionally, SHL requests that all laboratories submit all organisms isolated during an outbreak for

possible strain typing to aid in the public health surveillance necessary for this illness. Call the SHL (319) 335-4500 for more information, or visit: www.shl.uiowa.edu/

The SHL will test implicated food items from a cluster or outbreak. Specimens are submitted through local public health departments.

C. Local Public Health Agency (LPHA) Follow-Up Responsibilities

Case Investigation

a. Individual cases: no routine follow-up required
b. Multiple cases/possible outbreak:
   If the number of reported cases of campylobacteriosis in a city/town is higher than usual, or if an outbreak is suspected, an investigation is warranted to determine the source of infection and mode of transmission. A common vehicle, such as water or food, should be sought and applicable preventive or control measures should be instituted (e.g., removing an implicated food item from the environment). Consult with an epidemiologist at IDPH or contact your regional epidemiologist if an outbreak is suspected**.** CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several county lines and therefore be difficult to identify at a local level.
c. If a food or water source is suspect, follow-up may include involvement of a representative of the Iowa Department of Inspections and Appeals, Food and Consumer Safety Bureau who is involved in enforcement of the Iowa Food Code.
d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Food handlers, those caring for patients or individuals in hospital, custodial intuitions and child cares with *Campylobacter* are to be excluded from work until diarrhea ceases and education on proper handwashing is given.

Minimum Period of Isolation of Patient

After diarrhea has resolved, food handlers may return to work.

Minimum Period of Quarantine of Contacts

Contacts of a case with diarrhea who are food handlers shall be considered cases and handled in the same fashion. No restrictions otherwise.

Note: A food handler is any person directly preparing or handling food. This can include a parent or child-care provider.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Child Care

Since campylobacteriosis may be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on outbreaks of campylobacteriosis in a child care. General recommendations include:

- Children with *Campylobacter* infection who have diarrhea should be excluded until their diarrhea is gone.

- Children with *Campylobacter* infection who have no diarrhea and are not otherwise ill may be excluded or remain in the program if special attention is given to proper handwashing.

Minimum Period of Quarantine of Contacts

Contacts of a case with diarrhea who are food handlers shall be considered cases and handled in the same fashion. No restrictions otherwise.

Note: A food handler is any person directly preparing or handling food. This can include a parent or child-care provider.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from use. A decision about testing food items implicated in an outbreak can be made in consultation with the Department of Inspections and Appeals, Food and Consumer Safety Division and CADE.

Personal Preventive Measures/Education

To avoid exposures, recommend that people:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, after changing diapers, and after touching their pets or other animals.
- After changing diapers, wash the child's hands as well as their own.
- In a child care, dispose of feces in a sanitary manner.
- When caring for someone with diarrhea, scrub their hands with plenty of soap and water after helping the person use the toilet, or changing diapers, soiled clothing or soiled sheets.
- Keep food that will be eaten raw, such as vegetables, from becoming contaminated by animal-derived food products.
- Avoid letting infants or young children come into contact with pets that are sick with diarrhea, especially puppies and kittens.
- Make sure to cook all food products from animals thoroughly, especially poultry products, and avoid consuming raw eggs or cracked eggs, unpasteurized milk, or other unpasteurized dairy products.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of campylobacteriosis to case's sexual partners as well as being a way to prevent the exposure to and transmission of other pathogens.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Campylobacteriosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2000 Red Book: Report of the Committee on Infectious Diseases*. Illinois, Academy of Pediatrics, 2000.
CDC. Case Definitions for Infectious Conditions under Public Health Surveillance, 1990: www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm
CDC Website. *Campylobacter* Infections. www.cdc.gov/nczved/divisions/dfbmd/diseases/campylobacter/
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

FACT SHEET CAMPYLOBACTERIOSIS

What is Campylobacteriosis?
Campylobacteriosis is a diarrheal illness caused by infection with a bacterium called *Campylobacter*. People who become ill with campylobacteriosis typically get diarrhea, cramping, abdominal pain, and fever. The illness usually occurs in the summer months.

Who can be infected?
Anyone may become infected, however campylobacteriosis is most common in infants and young adults.

How are the bacteria spread?
Improper handling of raw poultry, eating raw or undercooked poultry, and drinking unpasteurized milk are all means of becoming infected. In addition, eating or drinking food or water that is contaminated by the feces (stool) of infected people or animals, without washing hands afterwards, can spread the bacteria.

What are the symptoms of *Campylobacter* infection?
The major symptom is diarrhea, which may be either mild or severe. Stomach cramps, fever, nausea, vomiting and generally "not feeling well" can also occur. Severe cases can mimic appendicitis.

How soon after infection do symptoms appear?
The symptoms usually start 2 - 5 days after infection, with a range from 1 - 10 days. Many persons who are infected may have no symptoms.

Are there long-term consequences of *Campylobacter* infection?
Most people recover completely within 2 - 5 days, although sometimes recovery can take up to 10 days. Relapses can occur. Rarely, some long-term consequence can occur. Some people may have arthritis following campylobacteriosis, others may develop a rare disease called Guillain-Barré syndrome. This syndrome may lead to paralysis that lasts several weeks and usually requires intensive care.

Where is *Campylobacter* found?
Many animals, such as cats, cows, dogs, and birds (especially chickens), carry the bacteria in their intestines. Infected animals may contaminate meat products, water supplies, milk, and other food items.

How long can a person spread *Campylobacter*?
People can spread the bacteria to others for a few days to several weeks after they are infected.

Should infected persons be excluded from school or work?
Since the bacteria are passed in the feces, people with diarrhea (especially children in child care or people who handle food) should not go to school or work. After diarrhea ends, persons may return to normal activities but they should carefully wash their hands after using the toilet and before preparing or eating food.

What is the treatment for *Campylobacter* infection?
Most people get well without treatment. Persons with diarrhea should drink plenty of liquids. Antibiotics such as erythromycin or a fluoroquinolone can be used, and can shorten the duration of symptoms if they are given early in the illness.

How can the spread of *Campylobacter* infection be stopped?
1. Always refrigerate poultry and meat products. Never leave raw poultry or meat at room temperature.
2. Always cook poultry completely. Never eat raw poultry.
3. Avoid consuming unpasteurized milk.
4. Carefully wash hands before and after preparing food.
5. Make sure children wash their hands carefully, especially after using the toilet, having diapers changed or handling pets.
6. Always wash hands with soap and warm water after using the toilet or changing diapers.
7. Always wash food preparation surfaces and utensils between cutting up raw meat or poultry and handling other foods

Campylobacter

Agency: ______

Investigator: ______ Phone number: ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______
First and middle name: ______
Maiden name: ______ Suffix: ______
Address line: ______
Zip: ______ City: ______
State: ______ County: ______
Phone: ( )- - ______ Type: ______
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ______

Date of Birth: / / Estimated? ☐ Age: ______
Gender: ☐ Female ☐ Male ☐ Other ______
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ______
Parent/Guardian phone: ( )- - ______ Type: ______

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom: ______
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ______ Country: ______

Healthcare provider information

Last name: ______
First name: ______
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - ______ Type: ______

LABORATORY FINDINGS

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Campylobacter*** Serotype:

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Campylobacter*** Serotype:

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Campylobacter*** Serotype:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admission date: / / Discharge date: / /
Days hospitalized: _____
Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Guillain-Barré Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

Reactive Arthritis Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

Symptoms

Diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Nausea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Vomiting ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Headache ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Muscle weakness ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Visible bloody diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Fever ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Highest known fever: _____ ☐ °F ☐ °C
Abdominal cramps ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Chills ☐ Yes ☐ No ☐ Unk _____ Days/Hours

First symptom: Most severe symptom: Date returned to normal activities: / /

OTHER LAB FINDINGS

Clinical specimen from case

Was PFGE performed: ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

Environmental specimen testing

Food, Medication, or environmental samples tested?	☐ Yes ☐ No ☐ Unk	Describe samples:	(indicate which test positive)
For what were the samples tested?	☐ Campylobacter ☐ E. coli or EHEC ☐ Salmonella ☐ Shigella ☐ Other testing (specify):		
	Positive? ☐ Yes ☐ No ☐ Unk		PFGE performed? ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

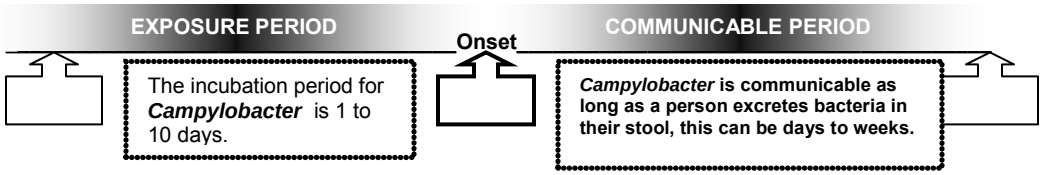
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of days:	# of days:	# of days:
# of times a day:	# of times a day:	# of times a day:
Route:	Route:	Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risk Factors/Travel Information – *In the 10 days prior to onset of symptoms did the case:*

Travel	Travel within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:		Departure date: / /	Return date: / /
	Travel within U.S.? ☐ Yes ☐ No ☐ Unk	State:	City:	Departure date: / /	Return date: / /
	Travel outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:		Departure date: / /	Return date: / /

Visit restaurants? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below: *County and address are missing from this table*

Establishment name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attend Group Gatherings (e.g. weddings, parties)? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Where did the case purchase groceries in the 2 weeks before the onset of symptoms:

Store name	Address	City/State/Zip	County	Date purchased
				/ /
				/ /
				/ /

Dietary Information – *In the 10 days prior to onset of symptoms did the case consume the following:*

Meat and poultry

Any of these meat products? ☐ Poultry ☐ Ground beef ☐ Meat other than ground meat (salami, jerky, wild game)

Was the meat fully cooked? ☐ Yes ☐ No ☐ Unknown

List all source/types: _____

List all brand names: _____

From dates consumed: / / , / / To dates consumed: / / , / /

Other poultry products

Raw/partially cooked eggs or in foods (e.g. cookie dough)**:** ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized products

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized juice: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other unpasteurized products (e.g. cheese): ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Animal Exposures – *In the 10 days prior to the onset of symptoms did the case:*

Check all that apply

Visit or live on a farm: ☐ Yes ☐ No ☐ Unknown

Exposed to manure: ☐ Yes ☐ No ☐ Unknown

Have farm animal contact: ☐ Yes ☐ No ☐ Unknown Animals: _____

Have other animal contact in home: ☐ Yes ☐ No ☐ Unknown Animal: Animal sick: ☐ Yes ☐ No ☐ Unk

Visit a petting zoo: ☐ Yes ☐ No ☐ Unknown Touched animals: ☐ Yes ☐ No ☐ Unk Animal: _____

Zoo name: Address/Zip/County:

Water Exposures – *In the 10 days prior to the onset of symptoms did the case:*

Drinking water supply

Home:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**School:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well
Work:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**Child care:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well

Other Exposures – *In the 10 days prior to the onset of symptoms did the case:*

Wear diapers ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unk

Have contact with immunocompromised person: ☐ Yes ☐ No ☐ Unk Setting: ☐ Home ☐ Work ☐ Other _____

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

CONTACTS

Number of people living in case's household: _____

Are there close contacts of the case with same symptoms: ☐ Yes ☐ No ☐ Unknown

Close contacts of the case with the same symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	
			Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

CHLAMYDIA

Also known as: *Chlamydia trachomatis*, "Silent" STD.

Responsibilities:
Hospital: Report cases by mail, phone or in IDSS
Infection Preventionist: Report cases by mail, phone or in IDSS
Lab: Report positive lab results by mail, phone or in IDSS
Physician: Report cases by mail or phone
Cases may be reported to your Local Public Health Agency (LPHA) or to Iowa Department of Public Health

Iowa Department of Public Health
Sexually Transmitted Disease Reporting Hotline: (515) 281-3031

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Chlamydia is a common sexually transmitted disease caused by a bacterium called *Chlamydia trachomatis*. Chlamydia are obligate intracellular bacteria sensitive to broad-spectrum antimicrobials.

B. Clinical Description

Symptoms: Chlamydia is known as a "silent" disease because more than half of persons diagnosed have no symptoms.

- Men with signs or symptoms may have a discharge from the penis or a burning sensation when urinating. Men might also have burning and itching around the opening of the penis. Pain or swelling of the testicles is uncommon. Most men have no symptoms.

- Women often have no symptoms, but if symptoms exist they may include an abnormal vaginal discharge or a burning sensation on urinating. When infection spreads to the fallopian tubes, some women still have no signs or symptoms; others have lower abdominal pain, low back pain, nausea, fever, pain during intercourse, or bleeding between menstrual periods.

- Men or women who have receptive anal intercourse may acquire chlamydia in the rectum, which can cause rectal pain, discharge, or bleeding. Chlamydia can also be found in the throats of men and women having oral sex with an infected partner.

Onset: If symptoms are present, they usually appear within 1 - 3 weeks after exposure.

Complications: If untreated, chlamydia can progress to serious reproductive and other health problems, with both short-term and long-term consequences.

- In women, untreated infection can spread into the uterus or fallopian tubes and cause pelvic inflammatory disease (PID). PID can cause permanent damage to the fallopian tubes, uterus, and surrounding tissues, leading to chronic pelvic pain, pain during intercourse, infertility, and potentially fatal ectopic pregnancy. Women infected with chlamydia are at increased risk for HIV infection if exposed to HIV while infected with chlamydia.

- To help prevent the serious consequences of chlamydia, an annual screening test for chlamydia is recommended for all sexually active women age 25 years and younger. An annual screening test is also recommended for women over 26 years of age with a new sex

partner, multiple sex partners, if signs and symptoms are present or with sex partner(s) who are known to have had chlamydia, urethritis, or another STI.

- Complications among men are rare. Infection sometimes spreads to the epididymis (the tube that carries sperm from the testis), causing pain, fever and, rarely, sterility.

- Rarely, genital chlamydia can cause a severe arthritis (Reiter's syndrome) that may be accompanied by skin lesions and inflammation of the eye and urethra.

C. Reservoirs

- Common reservoirs: Humans are the only known reservoir.

D. Modes of Transmission

Person-to-person: Chlamydia is spread through contact between the penis, vagina, mouth, and anus. Ejaculation does not have to occur for chlamydia to be transmitted or acquired. Chlamydia can be spread from mother to baby during birth. An infected infant usually has signs and symptoms of conjunctivitis or pneumonia.

Any sexually active person can be infected with chlamydia. The greater the number of sex partners, the greater the risk of infection. Because the cervixes of teenage girls and young women are not fully matured, they are at particularly high risk of infection if sexually active. Since chlamydia can be transmitted by oral or anal sex, men who have sex with men are also at risk for chlamydia. In rare cases, women who have sex with women have contracted chlamydia from a female partner through oral sexual contact or the sharing of sex toys.

E. Incubation period

The incubation period is highly variable and poorly defined. A range of 7 - 21 days has been documented, but 7 - 14 days is more common.

F. Period of Communicability or Infectious Period

A person can spread the disease from the time he/she is infected with chlamydia, until properly treated. Re-infection is common if partners are not adequately treated in a timely manner.

G. Epidemiology

Chlamydia is one of the most frequently reported sexually transmitted infections in the United States. In 2011, 1,412,791 chlamydial infections were reported to CDC from 50 states and the District of Columbia Under-reporting is substantial, because most people with chlamydia are not aware of the infection and do not seek testing. Testing is not often done if patients are treated for symptoms. An estimated 3 million Americans are infected with chlamydia each year. Women are frequently re-infected if their sex partners are not treated.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To interrupt disease transmission, the Iowa Department of Public Health provides partner services for persons at highest risk for re-infection and complications resulting from infection. This group includes those patients aged 18 and younger, pregnant women, those patients diagnosed in an E.R., those patients co-infected with another STD, those patients who are re-infected, and those patients for which a provider specifically requests partner services.

B. Laboratory and Healthcare Provider Reporting Requirements:

Iowa Administrative Code 641-1.3(139) stipulates that both the laboratory and healthcare providers must report. Laboratory personnel should forward results of tests directly to the Iowa Department of Public Health or local health department. Providers with IDSS access may report in IDSS.

Healthcare Providers must complete an "Iowa Confidential Report of STD & HIV Infection" morbidity card within 3days of a positive Chlamydia trachomatis infection. For each reported case, the provider should provide a home address, phone number, gender, race, test performed including the specimen source, treatment information, and any known partner information including treatment of partners.

Reporting forms and confidentially coded postage-paid envelopes are available free of charge from the clearinghouse at healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 Please send reports to the address below.

Iowa Department of Public Health
STD Program
Bureau of HIV, STD, and Hepatitis (00)
321 East 12th Street
Des Moines, IA 50319-0075

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation:

Risk reduction counseling and partner notification/referral services will be provided by Disease Prevention Specialists employed by the Iowa Department of Public Health, or by Black Hawk or Polk County health departments. Chlamydia partner follow-up is not offered in Scott or Linn counties.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

The Iowa Department of Public Health may initiate voluntary partner services with persons who have been diagnosed with Chlamydia Trachomatis infection. Healthcare providers can facilitate this process by describing the program to the patient and encouraging the patient to meet with the department's Disease Prevention Specialist assigned to his or her region.

Patients who may receive partner services for Chlamydia infection include:

- Those aged 18 and under
- Those seen in an E.R.
- Those who are pregnant
- Those who are re-infected
- Those who are not treated
- Those who are co-infected with another STD
- Those who do not fit any other category, but in which the health care provider specifically requests partner services

Patients' names and times of exposure are not used in the notification of partners. Referral for testing and treatment are offered to all partners. Appropriate referrals for other services are provided.

Physicians may assist the Disease Prevention Specialist with collecting partner information. In such cases, the healthcare provider should collect the following information: partner name, address, home phone number, age and/or date of birth, race, sex, partner marital status, height, size/build, general description of the partner, and dates of first and last exposure. Any other information that may help

in locating and counseling the partner may also be included, such as medical conditions, place of employment, cell phone numbers, or other unusual circumstances/situations. Providers should report any partner treatment.

Patients who fall outside of the above criteria for assisted partner services should be encouraged to inform their partners of the need for testing and treatment. The targeted partners include all sexual partners within 60 days of date of onset of symptoms or within 60 days of the date of positive test – whichever is greater. If there have been no sexual partners within 60 days, the most recent partner should be informed.

Partner-delivered therapy/ Expedited Partner Therapy: When a patient has partners who may not be willing or who may be unable to submit to testing, partner-delivered therapy is an option. A physician, physician assistant, or advanced registered nurse practitioner who diagnoses a sexually transmitted chlamydial or gonococcal infection may prescribe, dispense, furnish, or otherwise provide prescription oral antibiotic drugs to that patient's sexual partner or partners without examination of the partner(s) (see Iowa Code 139A.41). If the infected individual patient is unwilling or unable to deliver such prescription drugs to a sexual partner or partners, a physician, physician assistant, or advanced registered nurse practitioner may dispense, furnish, or otherwise provide the prescription drugs to the department or local disease prevention investigation staff for delivery to the partner or partners. Medications or prescriptions should be provided for all partners who have been sexually exposed to the patient within the two months prior to diagnosis or within the two months prior to the onset of symptoms, whichever is greater. However, expedited partner therapy should not be used if the partner is a pregnant woman or if the patient is a man who has sex with other men (MSM). Further information on expedited partner therapy can be found at www.idph.state.ia.us/adper/std_control.asp.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Report unusual cases to the Iowa Department of Public Health at 515-281-3031.

D. Preventive Measures

Preventive Measures/Education

Risk reduction counseling/education and testing should be offered to all persons with risk for *Chlamydia trachomatis* infection and transmission.

The surest way to avoid transmission of sexually transmitted diseases is to abstain from sexual contact, or to be in a long-term mutually monogamous relationship with a partner who has been tested and is known to be uninfected.

Latex condoms, when used consistently and correctly, can reduce the risk of chlamydia transmission.

Chlamydia screening is recommended annually for all sexually active women 25 years of age and younger. All pregnant women should have a screening test for chlamydia. Women older than 25 years whose sexual practices put them at risk for chlamydial infection should be tested at least once a year. It has been shown that screening and treatment of chlamydial infection of the cervix reduces the likelihood of PID.

The Center's for Disease Control and Prevention's 2010 STD Treatment Guidelines recommend specific STD prevention services that should be provided for all sexually active men who have sex with men (MSM). The first recommendation for this population is that STD screening be performed at least annually.

Any genital symptoms such as discharge or burning during urination or unusual sore or rash should be a signal to stop having sex and to consult a healthcare provider immediately. If a person has been treated for chlamydia (or any other STD), he/she should notify all recent sex partners to see a healthcare provider and be treated. This will reduce the risk that the sex partners will develop serious complications from chlamydia, and will also reduce the person's risk of becoming re-infected. The person and all of his or her sex partners must avoid sex until treatment is completed.

An infected patient treated for chlamydia should be tested for other sexually transmitted diseases.

See www.hivtest.org/STDTesting.aspx for a current list of sites that can provide STD testing.

4) ADDITIONAL INFORMATION

Treatment information

Chlamydia can be treated and cured with antibiotics. A single dose of azithromycin, or 7 days of doxycycline (twice daily), are the most common treatments. Refer to the current "CDC Guidelines for Treatment of Sexually Transmitted Diseases" for appropriate treatment. HIV-positive persons with chlamydia should receive the same treatment as those who are HIV negative.

All sex partners within 60 days of onset of symptoms or within 60 days of a positive test (whichever is greater) should be evaluated, tested, and treated if necessary. When there has been no sexual partner in the last 60 days, the most recent partner should be evaluated, tested, and treated if necessary. The CDC recommends presumptive treatment at the time of exam for all exposed partners to a known infected patient. Persons with chlamydia should abstain from sexual intercourse until they and their sex partners have completed treatment to avoid re-infection.

Women whose sex partners have not been appropriately treated are at high risk for re-infection. Multiple infections increase a woman's risk of serious reproductive health complications, including infertility. Women, especially adolescents, should consider retesting for chlamydia three to four months after treatment is completed. This is especially true if they are uncertain whether sex partners received treatment.

Laboratory criteria for diagnosis

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Chlamydia can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines 2010. MMWR 2010; 59, RR-12 www.cdc.gov/std/treatment/2010/default.htm

Update to CDC's *Sexually Transmitted Diseases Treatment Guidelines, 2006*: Fluoroquinolones No Longer Recommended for Treatment of Gonococcal Infections - MMWR April 13, 2007

CDC. Sexually Transmitted Disease Statistics, 2009. www.cdc.gov/std/stats09/tables.htm

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Notification And Surveillance of Reportable Communicable and Infectious Diseases, Poisonings and Conditions. Iowa Code 2010 Section 139A.

Stamm, W.E. Chlamydia trachomatis infections of the adult. In: K. Holmes, P. Mardh, P. Sparling et al (eds). Sexually Transmitted Diseases, 3rd edition. New York: McGraw-Hill, 1999, 407-422.

Additional Resources

CDC Website with most current guidelines for prevention, surveillance, and treatment:
www.cdc.gov/nchstp/dstd/chlamydiaInfo.htm
STD Program web site, Iowa Department of Public Health.
www.idph.state.ia.us/HivStdHep/STD.aspx?prog=Std&pg=StdHome

FACT SHEET CHLAMYDIA

What is chlamydia?
Chlamydia is a common sexually transmitted disease (STD) caused by the bacterium *Chlamydia trachomatis*.

How common is chlamydia?
An estimated 3 million Americans are infected with chlamydia each year. Women are frequently re-infected if their sex partners are not treated.

How do people get chlamydia?
Chlamydia can be transmitted during vaginal, anal, or oral sex, or passed from an infected mother to her baby during vaginal childbirth.

Any sexually active person can be infected with chlamydia. The greater the number of sex partners, the greater the risk of infection.

What are the symptoms of chlamydia?
Chlamydia is known as a "silent" disease, because more than 50% of infected persons do not have symptoms. If symptoms do occur, they usually appear within 1 - 3 weeks after exposure.

Women with symptoms might have an abnormal vaginal discharge, or a burning sensation when urinating (peeing). As the infection progresses, some women may still have no signs or symptoms; others have lower abdominal pain, low back pain, nausea, fever, and pain during intercourse, or bleeding between menstrual periods.

Men with symptoms may include a discharge from the penis or a mild burning sensation when urinating, burning and itching around the opening of the penis, and occasionally, pain and swelling in the testicles.

Men or women who have anal intercourse may acquire chlamydial infection in the rectum, which can cause rectal pain, discharge, or bleeding.

Chlamydia can be found in the throats of men and women having oral sex with an infected partner.

What complications can result from untreated chlamydia?
Untreated infections can progress to serious reproductive and other health problems with both short-term and long-term results.

In women, untreated infection can spread into the uterus or fallopian tubes and cause pelvic inflammatory disease (PID). PID can cause permanent damage to the fallopian tubes, uterus, and surrounding tissues. The damage can lead to chronic pelvic pain, chronic pain during intercourse infertility, and potentially fatal ectopic (outside the uterus) pregnancy. Women infected with chlamydia are at increased risk for HIV infection if exposed.

Complications among men are rare. Infection sometimes spreads to the epididymis (the tube that carries sperm from the testis), causing pain, fever, and, sometimes, sterility.

How does chlamydia affect a pregnant woman and her baby?
There is some evidence that untreated infections can lead to premature delivery. Babies who are born to infected mothers can get chlamydia infections in their eyes and respiratory tracts. Chlamydia is a leading cause of early infant pneumonia and conjunctivitis (eye infection) in newborns.

How is chlamydia diagnosed?
There are laboratory tests to diagnose chlamydia. A discussion about risk factors will help your medical provider decide whether you should be tested.

What is the treatment for chlamydia?
Chlamydia can be treated and cured with antibiotics. All sex partners should be evaluated, tested, and treated if necessary. Persons with chlamydia should abstain from sexual intercourse until they and their sex partners have completed treatment, to avoid re-infection.

How can chlamydia be prevented?
The best way to avoid transmission of sexually transmitted diseases is to abstain from sexual contact, or to be in a long-term mutually monogamous relationship with a partner who has been tested and is known to be uninfected, and is faithful.

Latex male condoms, when used consistently and correctly, can reduce the risk of transmission of chlamydia.

Chlamydia screening is recommended annually for all sexually active women 25 years of age and younger. All pregnant women should have a screening test for chlamydia. Women older than 25 years whose sexual practices put them at risk for chlamydia should be tested at least once a year.

Any genital symptoms such as discharge, burning during urination, or unusual sore or rash should be a signal to stop having sex and consult a healthcare provider immediately. A person treated for chlamydia (or any other STD) should notify all recent sex partners so they can seek treatment. This will reduce the risk of sex partners developing serious complications from chlamydia, and reduce the person's risk of becoming re-infected. The person and all of his/her sex partners must avoid sex until they have completed treatment.

CHOLERA

Report Immediately by phone

Potential Bioterrorism Agent: Category B

Also known as: *Vibrio cholera*, Asiatic cholera and epidemic cholera

Responsibilities:
Hospital: Report immediately by phone
Lab: Report immediately by phone
Physician: Report immediately by phone
Local Public Health Agency (LPHA): Report immediately by phone; begin active surveillance for additional cases. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Cholera is an acute watery diarrheal disease caused by enterotoxins produced by *Vibrio cholerae* bacteria. Two serogroups, O1 and O139, cause extensive epidemics and worldwide pandemics of disease. Non-toxigenic or non-O1, non-O139 V. cholerae infections can cause sporadic illness but do not cause epidemics.

Note: This chapter only pertains to *Vibrio cholerae*. Other species of *Vibrio* (e.g., *V. parahaemolyticus, V. vulnificus*) are not reportable except in outbreak situations.

B. Clinical Description

Symptoms: (Mild illness) Infection by O1 or O139 serogroups of V. cholerae usually results in asymptomatic or mild diarrhea.

Symptoms: (Severe illness) In approximately 1 out of 20 people infected, disease is more severe characterized by profuse watery stools, nausea, some vomiting and muscle cramps.

Complications: Dehydration may develop rapidly and lead to shock and sometimes death within hours. The case-fatality rate in severe untreated cases may exceed 50%; with proper treatment, the rate is less than 1%.

C. Reservoirs

Humans are the primary reservoir although environmental reservoirs exist in brackish or estuarine aquatic environments.

D. Modes of Transmission

V. cholerae is usually transmitted via the ingestion of food or water contaminated (directly or indirectly) by feces or vomitus of infected persons (e.g., via sewage) or by ingestion of raw or undercooked seafood harvested from polluted waters. Large epidemics often related to fecal contamination of water supplies or

street vendor foods have been recognized. The disease can spread rapidly in areas with inadequate treatment of sewage and drinking water.

E. Incubation Period

The incubation period ranges from a few hours to 5 days; more commonly within 2 - 3 days.

F. Period of Communicability or Infectious Period

The disease is not likely to spread directly from one person to another as long as standard infection prevention practices are followed; therefore, casual contact with an infected person is not a risk for becoming ill. However, cholera presumably has the potential to be transmitted person to person as long as stools test positive for the bacterium, most likely until a few days after recovery from symptoms. Shedding of bacteria may occasionally persist for several months. Antibiotics effective against the infecting strains shorten the period of communicability.

G. Epidemiology

Since the early 19th century, pandemic cholera has appeared off and on in most parts of the world. Cholera is a major cause of epidemic diarrhea throughout the developing world. There has been an ongoing global pandemic in Asia, Africa and Latin America for the last four decades. In 2009, 45 countries reported 221,226 cholera cases and 4,946 cholera deaths (case-fatality rate 2.24%) to the World Health Organization (WHO). Poor areas continue to report the vast majority of cases; 99% of cases were reported from Africa, continuing a trend.

In the United States, most cases occur among travelers returning from areas experiencing epidemic cholera. Sporadic cases have also occurred among persons ingesting inadequately cooked shellfish harvested from coastal waters along the Texas and Louisiana borders. Currently, most cholera outbreaks have been linked to the El Tor biotype. Studies show that some protection against biotypes (strains) within a serogroup is conferred from previous infection. No protection, however, results from infection with O1 serogroup against O139 serogroup and vice versa.

H. Bioterrorism Potential

Category B Agent: *Vibrio cholerae* O1 and O139 are identified as a Category B bioterrorism agent, seen particularly as a water safety threat by the CDC. If acquired and properly disseminated, *Vibrio cholerae* O1 and O139 could cause a serious public health challenge because the bacteria are moderately easy to disseminate, result in moderate morbidity rates and low mortality rates, and require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify sources of major public health concern (*e.g.,* contaminated water or a contaminated lot of shellfish) and to stop transmission from such a source.
- To identify human cases of epidemic strains of *V. cholerae* to prevent transmission from such individuals.
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider immediately report any suspected or confirmed case. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. After business hours please call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

Report any suspicion of cholera called to your attention. This could take the form of a healthcare provider or laboratory inquiring about cholera testing. Note: Due to the rarity and potential severity of cholera, IDPH requests information about any suspect or known case of cholera, or any suspected exposure that may be bioterrorism in nature, is immediately reported to IDPH by the Disease Reporting Hotline (800) 362-2736.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) will test stool specimens for the presence of *Vibrio cholerae*. It will further identify isolates of V. cholerae as serogroup O1. All V. cholerae non-O1 are sent to CDC for serogroup 139 testing. SHL will also confirm and/or further identify isolates of other *Vibrio* species obtained from stool specimens or other sources.

Additionally, SHL requests that all laboratories submit all isolates of V. cholerae, V. vulnificus and V.parahaemolyticus cultured for further testing to aid in the public health surveillance necessary for this illness. Blood specimens requiring serologic testing for evidence of recent infection are sent to the Centers for Disease Control and Prevention (CDC). Contact SHL for submitting blood samples to CDC. For more information about submitting specimens, contact SHL at (319) 335-4500.

SHL can test implicated food items from a cluster or outbreak. Food is submitted through the local public health department.

C. Local Public Health Agency Follow-Up Responsibilities

1. Case Investigation

a. Case investigation of cholera in Iowa residents will be directed by IDPH Center for Acute Disease Epidemiology (CADE) (due to the rare occurrence of cholera, the primarily imported nature of the disease, and its potential severity). If a bioterrorism event is suspected, IDPH and other response authorities will work closely with LPHA(s) and provide instructions/information on how to proceed.

b. Following notification to IDPH, the LPHA may be asked to assist in completing a Surveillance Report form by interviewing the case and others who may be able to provide pertinent information. The Iowa Disease Surveillance System (IDSS) is the preferred method of recording investigation information. Much of the information required on the form can be obtained from the healthcare provider or the medical record.

c. If several attempts have been made to obtain case information, but have been unsuccessful (the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please contact IDPH/CADE staff for assistance. Please notify IDPH/CADE at (800) 362-2736 regarding progress on the case and use IDSS for case information data entry.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Food handlers with cholera must be excluded from work.

Minimum Period of Isolation of Patient

After diarrhea has resolved, food handling facility employees may only return to work after producing one negative stool specimen. If the case is treated with an antimicrobial, the stool specimen shall not be submitted until at least 48 hours after cessation of therapy. In outbreak circumstances, a second consecutive negative stool specimen will be required prior to returning to work.

Minimum Period of Quarantine of Contacts

Contacts with diarrhea, who are food handling facility employees, shall be considered the same as a case and handled in the same fashion. No restrictions otherwise.

B. Protection of Contacts of a Case

Persons who shared food or water with a case during their infectious period should be observed for 5 days from last exposure for signs of illness. Preventive antibiotic therapy is usually not recommended for household contacts in the United States since secondary spread is rare. Immunization of contacts is not indicated.

C. Managing Special Situations

Locally Acquired Case

A locally acquired case of cholera is an unusual occurrence as most cases occur among travelers returning from areas experiencing epidemic cholera. If it is determined during the course of an investigation that a case or suspect case does not have a recent travel history to an endemic country, contact IDPH/CADE at (800) 362-2736 as soon as possible for assistance in instituting an investigation to determine source of infection and mode of transmission.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If an outbreak is suspected, or if multiple cases are reported among people who have not traveled out of the United States, investigate to determine the source of infection and mode of transmission. A contaminated vehicle (such as water or food) should be sought and applicable preventive or control measures should be instituted. Since person-to-person transmission is theoretically possible, special emphasis should be placed on personal cleanliness and sanitary disposal of feces. Consult with IDPH/CADE at (800) 362-2736. CADE can help determine a course of action to prevent further cases and can perform surveillance for other cases that may cross several town lines and therefore be difficult to identify at a local level. If a bioterrorist event is suspected, IDPH and other response authorities will work closely with LPHA(s) and provide instructions/information on how to proceed.

D. Preventive Measures

Environmental Measures

Implicated food items from Iowa or elsewhere in the United States must be removed from the environment. A decision about testing implicated food items can be made in consultation with the Department of Inspections and Appeals, Food and Consumer Safety Division (DIA). If a commercial product is suspected, DIA will coordinate follow-up with relevant outside agencies.

Note: The role of the DIA is to provide policy and technical assistance with the environmental investigation such as interpreting the Iowa Food Code, conducting a Hazard Analysis Critical Control Point (HACCP) risk assessment, initiating enforcement actions and collecting food samples.

Personal Preventive Measures/Education

To avoid exposure, recommend that individuals:

- Not eat raw or undercooked fish or shellfish. Despite good sanitation, even shellfish harvested from coastal United States waters have periodically been contaminated with *V. cholerae*.
- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet and after changing diapers.
- After changing diapers, wash the child's hands and their own.
- In a child care, dispose of feces in a sanitary manner.
- When caring for someone with diarrhea, scrub their hands with plenty of soap and water after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes, or soiled sheets.

International Travel

Travelers going to cholera endemic areas should pay attention to what they eat and drink. Avoiding risky foods may help protect against other illnesses, including traveler's diarrhea, typhoid fever, dysentery, and hepatitis A.

Travelers should:

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than un-carbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water.
- Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and that are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel their own raw fruits or vegetables and do not eat the peelings.
- Avoid foods and beverages from street vendors.
- Avoid undercooked or raw fish or shellfish, including ceviche.
- Not bring any perishable food back to the United States.

For more information regarding international travel and the cholera vaccines, contact the CDC's Traveler's Health Office at (800) 232-4636 (general number) or through the Internet at www.cdc.gov/travel

At the present time, the manufacture and sale of cholera vaccine in the United States has been discontinued. It is not recommended for travelers because of the brief and incomplete immunity if offers. No cholera vaccination requirements exist for entry or exit in any country.

Two vaccines available in other countries may be more effective but neither is available in the U.S. (Dukoral®, Biotec AB and Shanchol®).

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Cholera can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.

CDC Website. *Cholera* Division of Bacterial and Mycotic Diseases. Available at: www.cdc.gov/cholera/index.html

Heymann, D.., ed. *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

Tauxe, R., Mintz, E., Quick, R. Epidemic Cholera in the New World: Translating Field Epidemiology into New Prevention Strategies. *Emerging Infectious Diseases*, 1995; 1:4, pp. 141-146.

FACT SHEET CHOLERA

What is cholera*?*
Cholera is an acute diarrhea disease caused by toxins produced by *Vibrio cholerae* bacteria.

Who is at risk?
Any person who ingests food or water contaminated by the bacteria is at risk of becoming ill. Those traveling to areas where cholera is more common and those with weakened immune systems are at an increased risk of becoming ill.

How is cholera spread?
V. cholerae is usually transmitted through the ingestion of food or water contaminated (directly or indirectly) by stool or vomit of infected persons (e.g., via sewage) or by ingestion of raw or undercooked seafood harvested from polluted waters.

What are the symptoms of cholera?
Most individuals infected with cholera develop mild illness involving only diarrhea. Less common are infected individuals that develop more severe illnesses characterized by profuse watery stools, nausea, some vomiting and leg cramps. These symptoms may become more severe because of rapid loss of body fluids and dehydration. Shock can occur in the most severe cases. Without rehydration therapy, death may occur within hours if severe illness is untreated. With proper treatment, the risk of fatal illness is significantly reduced.

How is cholera diagnosed?
Often the diagnosis is made by either isolation of the bacteria in the stool or laboratory testing for evidence of infection through a blood test.

How is cholera treated?
When diarrhea is present, aggressive fluid replacement is an important part of treatment. In addition, a physician may prescribe certain antibiotics.

How can cholera be prevented?
Although the risk of cholera infection is low in the United States, travelers to coastal regions and those traveling to areas where cholera is typically found are at an increased risk of becoming ill.
General Tips**:**

- Do not eat raw or undercooked fish or shellfish, including ceviche.
- Always wash hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- After changing diapers, wash the child's hands and your own.
- In a child care, dispose of feces in a sanitary manner.

When traveling:

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than uncarbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water.
- Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and that are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel your own raw fruits or vegetables and do not eat the peelings.
- Avoid foods and beverages from street vendors.
- Do not bring any perishable food back to the United States.

Cholera

Agency: ______
Investigator: ______ Phone number: ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______
First and middle name: ______
Maiden name: ______ Suffix: ______
Address line: ______
Zip: ______ City: ______
State: ______ County: ______
Phone: ( )- - Type: ______
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ______

Date of Birth: / / Estimated? ☐ Age: ______
Gender: ☐ Female ☐ Male ☐ Other ______
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ______
Parent/Guardian phone: ( )- - Type: ______

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ______ Country: ______

Healthcare provider information

Last name: ______
First name: ______
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - Type: ______

LABORATORY FINDINGS

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other ______
Organism: Type (e.g. serogroup):

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other ______
Organism: Type (e.g. serogroup):

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other ______
Organism: Type (e.g. serogroup):

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

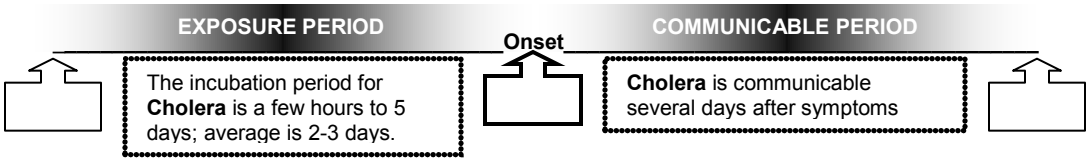
Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



CLINICAL INFO & DIAGNOSIS

Symptoms ☐ Abdominal cramps ☐ Diarrhea ☐ Headache ☐ Muscle pain ☐ Nausea ☐ Shock ☐ Visible bloody diarrhea ☐ Vomiting ☐ Watery diarrhea

In the 30 days prior to onset, were any of the following treatments received:

Antibiotics? ☐ Yes ☐ No ☐ Unknown *If Yes, complete the following table:*

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____ # of times a day: _____
Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____ # of times a day: _____
Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____ # of times a day: _____
Route: _____

Chemotherapy: ☐ Yes ☐ No ☐ Unk Type: _____ Immuno-suppressant: ☐ Yes ☐ No ☐ Unk Type: _____

Radiation therapy: ☐ Yes ☐ No ☐ Unk Type: _____ Antacid: ☐ Yes ☐ No ☐ Unk Type: _____

Systemic steroid: ☐ Yes ☐ No ☐ Unk Type: Ulcer medication: ☐ Yes ☐ No ☐ Unk Type:

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of days: # of times a day:	# of days: # of times a day:	# of days: # of times a day:
Route:	Route:	Route:

RISK FACTORS/TRAVEL

Vaccinated for cholera? ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

Number of vaccinations: _____

In the 7 days prior to the onset of the symptoms has the case:

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk Country: _____ Departure date: / / Return date: / /

Other Exposures

Raw/partially cooked seafood consumed? ☐ Yes ☐ No ☐ Unk Source/ type: _____ Brand name: _____

From date consumed: / / To date consumed: / /

Street vendor food consumed? ☐ Yes ☐ No ☐ Unk Vendor name: _____

Address: _____ Zip: _____ City: _____ State: _____

County: Phone: Type:

Worked with a Case: ☐ Yes ☐ No ☐ Unk From date: / / To date: / /

Lived with another Case: ☐ Yes ☐ No ☐ Unk From date: / / To date: / /

Went Swimming? ☐ Yes ☐ No ☐ Unk Water type: _____ Location type: _____

Facility name: _____ From date swam: / / To date swam: / /

Address: _____ Zip: _____ City: _____ State: _____

County: Phone: Type:

CONTACTS

Number of people living in case's household: _____ **Close contacts with the case and/or same exposures**? ☐ Yes ☐ No ☐ Unknown

Close contacts of case or close contacts with same exposures

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case	List symptoms	Symptom onset date	Is contact a case?

☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian
☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other
/ /
☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

CRYPTOSPORIDIOSIS

Potential Bioterrorism Agent: Category B

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Laboratory: Report by IDSS, facsimile, mail or phone
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Follow-up Required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Cryptosporidiosis refers to disease caused by *Cryptosporidium,* a coccidian protozoan. Many species of *Cryptosporidium* exist that infect humans and a wide range of animals. *Cryptosporidium parvum* and *Cryptosporidium hominis*, are the most prevalent species causing disease in humans, infections by *C. felis*, *C. meleagridis*, *C. canis*, and *C. muris* have also been reported. *Cryptosporidium* was not recognized as a cause of human illness until 1976.

B. Clinical Description

Symptoms: The most common symptom of cryptosporidiosis is profuse and watery diarrhea, which may be preceded by anorexia and vomiting in children. The diarrhea is associated with cramping abdominal pain. Other signs and symptoms include weight loss, stomach cramps, nausea, vomiting, and low-grade fever. Some people with cryptosporidiosis will have no symptoms at all. While the small intestine is the site most commonly affected, *Cryptosporidium* infections could possibly affect other areas of the digestive or respiratory tract. Asymptomatic infections are common and often serve as a source of infection for others.

Complications: Symptoms often wax and wane, but improve in fewer than 30 days in most immunocompetent people (average is 10 days). Immunodeficiency, especially in HIV infection, is associated with an inability to clear the parasite, and the disease may have a prolonged and fulminant clinical course, leading to death.

Treatment: FDA licensed nitazoxanide (Alinia®) for the treatment of diarrhea caused by *Cryptosporidium* in immunocompetent individuals >1 years of age.

C. Reservoirs

Common reservoirs: The reservoirs for the *Cryptosporidium species* that infect humans are humans, cattle, and other domesticated animals, including pets.

D. Modes of Transmission:

Spread: Transmission is fecal-oral, which includes person-to-person, animal-to-person, waterborne and foodborne.

Survivability: The oocyst of the parasite can survive in feces for a prolonged length of time and is resistant to chlorination.

Person-to-person: Many persons are infected by hand-to-mouth transfer of oocysts from the feces of an infected person, especially in institutions and child care centers. Transmission can also occur person-to-person through sexual contact, particularly oral-anal contact. Infected animals and people excrete large numbers of oocysts in stool and, although the infectious dose is not certain, it is probably very low.

Waterborne/Foodborne: Oocysts are relatively hardy and can survive in the environment for weeks or months. They are resistant to concentrations of chlorine and other disinfectants commonly used for drinking water or swimming pool treatment. Large outbreaks traced to contaminated drinking water have been reported, including an outbreak in Milwaukee that reportedly affected 400,000 people. Localized outbreaks may occur from fecally contaminated water, such as streams/lakes and swimming pools open to contamination by human and animal feces. Outbreaks have resulted from eating food contaminated by animal feces (*e.g.,* unpasteurized apple cider). An infected food worker could be a source of foodborne transmission. There have also been outbreaks associated with "recreational water", meaning water used for swimming such as municipal swimming pools, lakes, etc.

Zoonotic: Transmission can occur through contact with feces from infected animals (a risk for livestock handlers, dairy farmers and veterinarians). People are not infected through contact with blood.

E. Incubation period

The incubation period is not precisely known; 1 - 12 days is the likely range, with an average of about 7 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes *Cryptosporidium* oocysts. Excretion generally begins at the onset of symptoms. Oocysts continue to be excreted in the stool for several weeks after symptoms subside, and they may remain infective outside the body for 2 - 6 months in a moist environment.

G. Epidemiology

Cryptosporidiosis has a worldwide distribution. Cases occur year-round with a peak during summer and early fall. Prior to 2006, approximately 70 cases were reported each year in Iowa. In recent years the number of cases reported in Iowa has dramatically increased with 397 cases in 2010, 364 cases reported in 2011 and 328 cases in 2012. In developed countries, the prevalence of infection ranges from < 1% to 4.5% of individuals surveyed by stool examination. The prevalence is significantly higher in developing regions of the world. Cryptosporidiosis is among the most common causes of persistent diarrhea in patients with AIDS in the United States. Children under two years of age, animal handlers, travelers to endemic areas, men who have sex with men, and close contacts of infected individuals are most likely to be infected. Outbreaks have been reported in child care centers and have been associated with public drinking water; swimming in contaminated pools, lakes and ponds; and drinking unpasteurized cider made from apples contaminated with cattle manure. It is estimated that 50% of dairy calves shed oocysts and that the parasite is present on >90% of dairy farms.

H. Bioterrorism Potential

Category B Agent: *Cryptosporidium parvum* is identified as a Category B bioterrorism agent, seen particularly as a water safety threat by the CDC. If acquired and properly disseminated, *Cryptosporidium parvum* could cause a serious public health challenge because the protozoans are

moderately easy to disseminate, result in moderate morbidity rates and low mortality rates, and require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (*e.g.,* a diapered child, child care attendee, or food handler) and, if so, prevent further transmission.
- To identify transmission sources of public health concern (*e.g.,* a contaminated public water supply) and stop transmission from the source.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) tests stool specimens for *Cryptosporidium*. Submit specimens in SHL's ova and parasite kit. Specimen collection kits are available from SHL. Contact SHL at (319) 335-4500 or visit the web site www.shl.uiowa.edu/kitsquotesforms/ for further instructions.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a. It is the LPHA's responsibility to complete a *Cryptosporidiosis* case investigation in the Iowa Disease Surveillance System (IDSS) by interviewing the case and others who may be able to provide pertinent information. Much of this information can be obtained from the case's health care provider or the medical record.

b. Use the following guidelines in completing the investigation:

1. Record the demographic information, event information, laboratory findings, date of symptom onset, symptoms, treatment, and other clinical information.
2. When asking about exposure history (food, travel, activities, etc.), use the incubation-period for cryptosporidiosis (1-12 days).
3. Ask about travel history and group gatherings to help identify where the case became infected.
4. If possible, record any restaurants at which the case ate, including food items(s) and date consumed.
5. Ask about water exposures. If exposure is thought to be related to a swimming pool, wading pool, spray/splash pad, or spa exposure, the responsible environmental health agency should be notified (refer to the *Pool Inspection Contractor Contact List*) so that an

exposure risk assessment can be conducted and action can be taken to prevent further exposure at that site.

6. Ask about water supply because cryptosporidiosis may be acquired through water consumption.
7. Household/close contact, pet or other animal contact, child care, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts. Determine whether the case attends or works at a child care and/or is a food handler or has recently shown calves at a county fair.
8. Ask if the patient knows others who have similar illness about the same time.
9. If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.*, the case or health care provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please enter as much information as has been gathered. Please enter into the Notes section the reason why any information could not be obtained. In IDSS, select the appropriate reason under the Event tab in the Event Exception field.

c. Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is through the Iowa Disease Surveillance System. The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

In health care settings Standard Precautions should be used. Use Contact Precautions for diapered or incontinent persons for the duration of illness or to control institutional outbreaks.

B. Managing Special Situations

Child Care

Since cryptosporidiosis may be transmitted person-to-person through fecal-oral transmission, it is important to follow up on outbreaks of cryptosporidiosis in a child care setting. General recommendations include:

- Children with *Cryptosporidium* who have diarrhea should be excluded until their diarrhea is resolved. Children are not required to provide two negative stools to return to child care.

- Children with *Cryptosporidium* who have no diarrhea and are not otherwise ill may remain in the program if special precautions are taken. (Proper hand-washing practices, separation of diapering and food preparation areas, excluding if symptoms should occur.)

Schools

Since cryptosporidiosis may be transmitted person-to-person through fecal-oral transmission, it is important to follow up on suspected outbreaks of cryptosporidiosis in a school setting carefully. General recommendations include:

- Students or staff with *Cryptosporidium* who have diarrhea should be excluded until the diarrhea is resolved.

- Students or staff with *Cryptosporidium* who do not handle food, have mild or no diarrhea and are not otherwise sick may remain in school if special precautions are taken. (Proper hand-washing practices, separation of diapering and food preparation area, excluding if symptoms should occur.)

Food Handler

Note: A food handler is any person directly preparing or handling food, including a patient care or child care provider. See glossary for a more complete definition.
Since *Cryptosporidium* can be transmitted person-to-person through fecal-oral contact, it is important to carefully follow up on outbreaks of *Cryptosporidium* in any setting. General recommendations include:

- Food handlers with *Cryptosporidium* infection who have diarrhea should be excluded until 24 hours after last bout of diarrhea, or until stools are formed.
- Food handlers must practice frequent and thorough handwashing, using warm, running water, soap with friction for at least 15 seconds, and thoroughly drying hands with paper towels or a blow dryer.

Swimming Pools

In recent years, outbreaks from community swimming pools have become more frequent, especially in the summer months. The increased availability of shallow water for infants and toddlers (diaper-age children) may be a major reason for these outbreaks. Normal chlorination (1-8 ppm) will not destroy *Cryptosporidium* oocysts. All cases should be counseled not to swim for 2 weeks after resolution of diarrhea. This is due to the low infectious dose and hardy nature of *Cryptosporidium* oocysts, which are resistant to chlorine.

Signs should be posted prominently at all swimming venues directing that anyone who has a diarrheal illness should not use a public pool. Careful attention should be given to children in diapers so that “fecal accidents” do not contaminate a swimming or wading pool. Diaper-age children should always wear swim diapers to help prevent swimming pool water contamination by gross fecal material. Children in diapers should not have contact with public swimming or wading pool water if they have a diarrheal illness. Caregivers should not change diapers on the deck of a swimming pool; most newer facilities have diaper changing areas within the bathhouse. Dirty diapers should be disposed of in a sanitary fashion (never rinsed in pool water). Caregivers should thoroughly wash their hands and those of the child after changing a diaper.

Swimming pool inspections in most counties are done by a city, county or regional environmental health agency. If a sporadic case or an outbreak of *Cryptosporidium* occurs and is thought to be related to a swimming pool, wading pool, spray/splash pad, or spa exposure, the responsible environmental health agency should be notified (refer to the *Pool Inspection Contractor Contact List*) so that an exposure risk assessment can be conducted and action can be taken to prevent further exposure at that site. Include the number of suspect and confirmed cases linked to the implicated site and the date potential exposure began (12 days before symptom onset of earliest case) when notifying the environmental health agency.

If public health and environmental health officials recommend superchlorination (refer to the CDC Fecal Accident Response Recommendations) of a pool, the superchlorination should be done to minimize the time the pool facility is closed. Closing a facility to superchlorinate may move users to other facilities nearby. Public health and environmental health officials should consider a recommendation that nearby swimming facilities also superchlorinate as a precaution against further transmission of *Cryptosporidium*.

Community Residential Programs

Actions taken in response to an outbreak of cryptosporidiosis in community residential programs will depend on the type of program and the level of functioning of the residents.

In long-term care facilities, residents with cryptosporidiosis should be placed on standard precautions until symptoms subside. Contact Precautions should be used for diapered or incontinent persons for the duration of illness or to control institutional outbreaks. Staff members with *Cryptosporidium* infection should not work until diarrhea is gone.

In residential facilities for the developmentally disabled, staff and clients with cryptosporidiosis must refrain from handling or preparing food for other residents until diarrhea has subsided. Staff members with cryptosporidiosis who are not food handlers should not work until diarrhea is gone.

C. Reported Incidence Is Higher than Usual / Community Outbreak Suspected

If the number of reported cases of cryptosporidiosis in your city or county is higher than usual, or if you suspect an outbreak, investigate to determine the source of infection and mode of transmission. A common vehicle (such as water, food, or association with a child care center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal hygiene and sanitary disposal of feces. Consult with the CADE ((800) 362-2736) for assistance with investigation and control.

D. Preventive Measures

Personal Preventive Measures/Education

All cases regardless of whether or not they received treatment should be counseled not to swim for 2 weeks after resolution of diarrhea. This is due to the low infectious dose and hardy nature of *Cryptosporidium* oocysts, which are resistant to chlorine. Children in diapers should not have contact with public swimming or wading pool water if they have a diarrheal illness.

To avoid exposure, recommend that individuals:

- Always wash hands thoroughly with soap and water before handling food or eating, after using the toilet or changing diapers, and after contact with animals, especially cattle.
- Wash the child's hands and their own after changing diapers.
- Avoid drinking raw milk, other unpasteurized dairy products, or unpasteurized juices.
- Wash all raw fruits and vegetables before serving.
- Dispose of feces in a sanitary manner, especially in child care centers or other institutional settings.
- Avoid drinking water from streams or lakes. Avoid drinking unboiled water while traveling in developing countries or whenever water quality is unknown. (Bringing water to a full, rolling boil is sufficient to kill *Cryptosporidium,* or use filters capable of removing particles 0.1-1.0 micrometers in diameter.*)*
- Adhere to local advisories to boil water.
- Avoid swallowing water when swimming. Lakes, streams, other surface waters and swimming pools may be contaminated with *Cryptosporidium*. Chlorination does not effectively eliminate the parasite.

It is unlikely that *Cryptosporidium* could cause illness in regulated, public drinking water, but immunocompromised individuals may want to consider the following recommendations:

- Boil tap water before drinking or making ice cubes.
- Consider the use of a home water filtering system with a very fine filter (absolute pore size of 1 micron or smaller). Such filters include reverse-osmosis filters; filters labeled "absolute" 1 micron; and those labeled as meeting National Sanitation Foundation (NSF) standard #53 for cyst removal.

- Avoid fecal contact.
- Avoid sexual practices that may involve direct contact with feces. Latex barrier protection should be used to prevent the spread of *Cryptosporidium* and exposure to and transmission of other pathogens to case's sexual partners.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Cryptosporidiosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.
CDC. Case Definitions for Infectious Conditions under Public Health Surveillance, 2011: www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

FACT SHEET For Public

CRYPTOSPORIDIOSIS (Crypto)

What is cryptosporidiosis?

Cryptosporidium is a parasite that causes diarrhea in both animals and humans. People can become ill with cryptosporidiosis (often called "crypto") by coming into contact with persons or animals shedding the parasite or by drinking contaminated water. Cases occur year round with a peak during summer or early fall.

Who gets cryptosporidiosis?

Anyone can get cryptosporidiosis. Children under 2 years of age, animal handlers, travelers, men who have sex with men, and close contacts of infected persons are more likely to be infected.

How is cryptosporidiosis spread?

Cryptosporidium is found in the feces (stool) of an infected person or animal. It is spread by putting something in the mouth that has been contaminated with the stool from an infected person or animal. It can also be spread by swallowing contaminated food or water.

What are the symptoms of cryptosporidiosis?

The major symptom of cryptosporidiosis is frequent and watery diarrhea accompanied by cramping belly pain. Other symptoms may include headache, nausea, vomiting, and low-grade fever. Some people have no symptoms. Symptoms may briefly improve and then get worse again, but people who are healthy usually get well in 14-30 days. Persons whose immune systems do not work properly may become seriously ill.

How soon do symptoms appear?

Symptoms appear between 1 - 12 days after infection with the parasite.

What is the treatment for cryptosporidiosis?

People who are healthy often improve without taking any medications. They should drink plenty of fluids to prevent dehydration due to diarrhea. Consult with a health care provider before taking anti-diarrheal medication. A medication called nitazoxanide (Alinia®) may be used to treat some people with cryptosporidiosis.

What can be done to prevent the spread of cryptosporidiosis?

- Always wash hands thoroughly with soap and water before handling food or eating, after using the toilet or changing diapers, and after contact with animals, especially cattle.
- Wash both the child's hands and their own after changing diapers.
- Avoid drinking raw milk, other unpasteurized dairy products, or unpasteurized juices.
- Wash all raw fruits and vegetables before serving.
- Dispose of feces in a sanitary manner, especially in child care centers or other institutional settings.
- Avoid drinking water from streams or lakes. Avoid drinking unboiled water while traveling in developing countries or whenever water quality is unknown. (Bringing water to a full, rolling boil is sufficient to kill *Cryptosporidium,* or use filters capable of removing particles 0.1-1.0 micrometers in diameter.)
- Adhere to local advisories to boil water.
- Avoid swallowing recreational water. Lakes, streams, other surface waters and swimming pools may be contaminated with *Cryptosporidium*. *Cryptosporidium* is resistant to chlorine and can survive for days in chlorine-treated water. Persons should stop using swimming pools or other aquatic facilities while ill and for at least 2 weeks after diarrhea resolves. People can pass the parasite in stool and contaminate water for weeks after symptoms have stopped.
- Crypto is resistant to bleach. Instead, use 3% hydrogen peroxide to clean.
- Ill individuals should remain out of child care, schools, and work until diarrhea is resolved.

FACT SHEET
For Healthcare Providers

CRYPTOSPORIDIOSIS
(Commonly referred to as "Crypto")

What is Cryptosporidiosis?
Cryptosporidiosis is a parasitic infection caused by the protozoan *Cryptosporidium*. *Cryptosporidium parvum* and *Cryptosporidium hominis*, are the most prevalent species causing disease in humans. Once an animal or person is infected, the parasite lives in the intestine and passes in the stool. The infectious oocyst of the parasite is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it very resistant to chlorine-based disinfectants.

What is the clinical description of Cryptosporidiosis?
The most common symptom of cryptosporidiosis is profuse and watery diarrhea. Other signs and symptoms include weight loss, stomach cramps, nausea, vomiting, and low-grade fever. Although infection is usually limited to the gastrointestinal tract, *Cryptosporidium* infections could possibly affect other areas of the digestive or the respiratory tract. Asymptomatic infections are common and often serve as a source of infection for others. Symptoms often wax and wane, but remit in fewer than 30 days. In most immunocompetent people (including children), the illness is self-limited, lasting 1 to 20 days (average 10 days). Immunodeficiency, especially in HIV infection, is associated with an inability to clear the parasite, and the disease may have a prolonged and fulminant clinical course, leading to death.

How is *Cryptosporidium* transmitted?
In order for infection to occur, the susceptible host must ingest water or other materials contaminated with the *Cryptosporidium* oocysts, referred to as fecal-oral transmission. Important routes of transmission include person-to-person, animal-to-person, foodborne, and waterborne (drinking and recreational).

Who is most at risk for Cryptosporidiosis?
Anyone can get cryptosporidiosis. People who are most likely to become infected with *Cryptosporidium* include: Child care workers and diaper-aged children who attend child care centers; Parents of infected children; International travelers; Swimmers who swallow water while swimming in swimming pools, lakes, rivers, ponds, and streams; and backpackers, hikers, and campers who drink unfiltered, untreated water.

How long is Cryptosporidiosis communicable?
The disease is communicable for as long as the infected person excretes *Cryptosporidium* oocysts. Excretion generally begins at the onset of symptoms. Oocysts continue to be excreted in the stool for several weeks after symptoms subside, and they may remain infective outside the body for 2 - 6 months in a moist environment.

What laboratory tests are used to diagnose *Cryptosporidium*?
Diagnosis is generally made by the microscopic identification of oocysts in fecal smears (Ova and Parasite Exam). Organisms can also be identified in intestinal biopsy tissue. For microscopic examination, there are three techniques available: wet mounts, stained smears (e.g., modified acid fast stain), and immunofluorescent staining. In addition, new and more sensitive enzyme immunoassay (EIA) tests have recently become available. EIA kit sensitivities and specificities reportedly range from 93 to 100 percent when used in a clinical setting. Since the infectious oocysts are excreted from the body intermittently, at least two stool samples should be examined before the test can be considered negative and *Cryptosporidium* is ruled out as the diagnosis.
The State Hygienic Laboratory uses the routine Ova and Parasite (O & P) microscopic exam and a special acid fast stain for *Cryptosporidium* if requested.

Is there a treatment for diarrhea caused by *Cryptosporidium*?
Yes, FDA licensed Nitazoxanide (Alinia®, Romark Laboratories, Tampa, FL, USA) for persons with healthy immune systems $\geq$ 1 year of age.

What about patients with compromised immune systems?

Nitazoxanide has been approved for treatment of diarrhea caused by *Cryptosporidium* in people with healthy immune systems. It is currently not approved to treat immunodeficient persons.

What is the dosage used for Nitazoxanide?

Immunocompetent Persons	
Adult dosage	500 mg BID x 3 days
Pediatric dosage	1-3 years; 100 mg BID x 3 days
	4-11 years; 200 mg BID x 3 days

Nitazoxanide oral suspension (100 mg/5 ml; patients ≥1 year of age) and Nitazoxanide tablets (500 mg; patients ≥12 years of age) are indicated for the treatment of diarrhea caused by *Cryptosporidium*.

What is the efficacy of Nitazoxanide?

Clinical cure (resolution of diarrhea) occurs in 72-88 percent of patients. Parasitologic cure (no *Cryptosporidium* detected in the stool) occurs in 60-75 percent. It may take up to 5 days for diarrhea to resolve in approximately 80 percent of patients.

What should I tell my patients with cryptosporidiosis?

- All infected persons, including those who have completed treatment, should not swim for two weeks after resolution of symptoms. *Cryptosporidium* oocysts are chlorine-resistant. It is critical that this recommendation is followed to prevent the spread of cryptosporidiosis through public swimming pools and other aquatic venues.
- Wash hands with soap and water after using the toilet, changing diapers, and before eating or preparing food.
- Avoid fecal exposure during sexual activity.

Is my patient required to have two negative stools before returning to school, child care, or work settings?

IDPH does not require persons with confirmed cryptosporidiosis to provide two negative stools to return to school, child care, or work settings. Persons with cryptosporidiosis should stay home until diarrhea and vomiting resolve.

For more information:

- CDC: www.cdc.gov/parasites/crypto/index.html
- CDC: www.cdc.gov/parasites/crypto/health_professionals/tx.html

FACT SHEET
For Schools

CRYPTOSPORIDIOSIS
(Crypto)

Purpose: Information for *school settings* when Crypto is present in their facility.

What is Crypto?
Crypto, or Cryptosporidiosis, is an illness that is caused by a parasite. It affects both animals and humans. People can get Crypto by coming in contact with other people or animals that have the parasite, swimming or playing in water with the parasite in it, or by drinking contaminated water.

Who can get Crypto?
Anyone. Employees who work with children in diapers are at increased risk for getting Crypto.

How is Crypto spread?
Crypto is found in the feces (stool) of an infected person or animal. It is spread:

- By putting something in your mouth or accidentally swallowing something that has come in contact with the stool of a person or animal infected with Crypto. This could be items such as toys, hands, eating utensils, etc. Items can be contaminated by a person who has not properly washed their hands after a diaper change or toileting.
- By accidentally swallowing Crypto picked up from surfaces (such as toys, bathroom fixtures, changing tables, diaper pails) contaminated with stool from an infected person.
- By swallowing recreational water contaminated with Crypto. Recreational water is water in swimming or wading pools, hot tubs, lakes, rivers, ponds, or streams that can be contaminated with sewage or feces from humans or animals. Note: Crypto is chlorine resistant and can live for days in pools.
- By eating uncooked food contaminated with Crypto. Thoroughly wash with uncontaminated water all vegetables and fruits you plan to eat or serve raw.

What are the symptoms of crypto?
The most common symptom of crypto is frequent and watery diarrhea. Other symptoms may include headache, nausea, vomiting and low-grade fever. Symptoms may briefly improve and then get worse again, but people who are healthy usually get well in 14-30 days. However, some people may not show symptoms of illness, but can still spread the disease to others.

How can schools prevent the spread of crypto?
- Frequent hand washing by both staff and students. Wash hands with hot, soapy water before handling foods and eating, and after using the toilet, diapering young children, and handling animals
- Exclude students and staff with diarrhea from school
- Disinfect surfaces and toys that may be contaminated with Crypto*
- Educate parents and staff about the illness and outbreak
- Employees and students with diarrhea should not prepare food for anyone
- Suspend the use of child wading pools, water tables, and other water based activities.
- If the school has a pool, contact your local environmental public health agency for more information on how to prevent the spread of Crypto through water exposure.
- Infected persons should not swim or be involved in any water activities – swimming, wading, etc. while ill and for at least **2 weeks** after diarrhea resolves.
- Separate diapering and food-handling areas and staff responsibilities
- Use disposable gloves with every diaper change
- Use disposable paper to cover diaper-changing area; change the paper with every diaper change
- Separate diaper-changing areas from children's play areas

***Disinfection of surfaces and objects**

Disinfect bathrooms and food preparation surfaces daily. Use a 3% hydrogen peroxide solution, or if available, 6% concentration of hydrogen peroxide, and let it sit on the surface for 20 minutes**. No disinfectant is guaranteed to be completely effective; however the 3% hydrogen peroxide is usually effective. Toys and tabletops also should be cleaned and disinfected with the 3% hydrogen peroxide solution for 20 minutes at least twice daily. Cloth toys may be washed and heat-dried in the clothes dryer for 30 minutes.

** *This solution is for schools that have staff or children with Crypto- usually two or more cases. This is not for general disinfection in schools without illness.*

Should hydrogen peroxide be used in addition to bleach?

If there is a confirmed case of crypto in the school, instead of a bleach solution, use a 3% (99% kill rate) or, if available, 6% (99.9% kill rate) concentration of hydrogen peroxide for cleaning. If for some reason schools are using both bleach and hydrogen peroxide, the surface to which the hydrogen peroxide was applied should be wiped and be completely dry before using bleach. Bleach, not hydrogen peroxide, should be used for general disinfection in schools without Crypto illness.

When is it safe for schools to switch back to normal non-hydrogen peroxide cleaning?

It is likely safe to switch back to normal routine cleaners and disinfectants one incubation period (12 days) after resolution of diarrhea and vomiting in child care cases. However, if there is a community-wide outbreak of Crypto, it might be reasonable to continue to use hydrogen peroxide longer than the 12 days.

Where do we find 6% hydrogen peroxide?

Any janitorial or cleaning supply warehouse that supplies hospitals will usually carry 6% hydrogen peroxide. The 6% concentration may also be labeled “20 volume.” A 3% hydrogen peroxide solution may be referred to as a “10 volume” solution.

Are students and/or staff required to have two negative stools before returning to school?

IDPH does not require students or staff confirmed with Crypto to provide two negative stools before returning to school. Both students and staff should remain out of schools until diarrhea and vomiting has stopped.

FACT SHEET **CRYPTOSPORIDIOSIS**

For Child Care Centers **(Crypto)**

Purpose: Information for *child care settings* when Crypto is present in their facility.

What is Crypto?

Crypto, or Cryptosporidiosis, is an illness that is caused by a parasite. It affects both animals and humans. People can get Crypto by coming in contact with other people or animals that have the parasite, swimming or playing in water with the parasite in it, or by drinking contaminated water.

Who can get Crypto?

Anyone. Child care workers and diaper-aged children who attend child care centers are at increased risk for getting Crypto.

How is Crypto spread?

Crypto is found in the feces (stool) of an infected person or animal. It is spread:

- By putting something in your mouth or accidentally swallowing something that has come in contact with the stool of a person or animal infected with Crypto. This could be items such as toys, hands, eating utensils, etc. Items can be contaminated by a person who has not properly washed their hands after a diaper change or toileting.
- By accidentally swallowing Crypto picked up from surfaces (such as toys, bathroom fixtures, changing tables, diaper pails) contaminated with stool from an infected person.
- By swallowing recreational water contaminated with Crypto. Recreational water is water in swimming or wading pools, hot tubs, lakes, rivers, ponds, or streams that can be contaminated with sewage or feces from humans or animals. Note: Crypto is chlorine resistant and can live for days in pools.
- By eating uncooked food contaminated with Crypto. Thoroughly wash with uncontaminated water all vegetables and fruits you plan to eat or serve raw.

What are the symptoms of Crypto?

The most common symptom of Crypto is frequent and watery diarrhea. Other symptoms may include headache, nausea, vomiting and low-grade fever. Symptoms may briefly improve and then get worse again, but people who are healthy usually get well in 14-30 days. However, some people may not show symptoms of illness, but can still spread the disease to others.

How can child care facilities prevent the spread of Crypto?

- Frequent hand washing by both staff and children. Wash hands with hot, soapy water before handling foods and eating, and after using the toilet, diapering young children, and handling animals
- Separate diapering and food-handling areas and staff responsibilities
- Disinfect diapering areas and toys*
- Use disposable gloves with every diaper change and change the paper with every diaper change
- Use disposable paper to cover diaper-changing areas
- Separate diaper-changing areas from children's play areas
- Educate parents and staff about the illness and outbreak
- Employees with diarrhea should not prepare food for anyone
- Suspend the use of child wading pools, water tables, and other water-based activities
- Children may come back to child care once they do not have diarrhea

***Disinfection of diaper changing areas and toys**

The Centers for Disease Control and Prevention (CDC) recommends the following procedure for child care centers with staff or children who have Crypto:

To reduce the level of Crypto, clean and disinfect tabletops and highchairs after each use by a child. Use a 3% hydrogen peroxide solution or if available, a 6% concentration of hydrogen peroxide, and let it sit on the surface for 20 minutes**. No disinfectant is guaranteed to be completely effective; however the 3% hydrogen peroxide is usually effective. Toys should also be cleaned and disinfected with the 3% hydrogen peroxide solution for 20 minutes at least twice daily. Cloth toys may be washed and heat-dried in the clothes dryer for 30 minutes.

*** This solution is for child care centers that have staff or children with Crypto. This is not for general disinfection in child care centers without illness.*

Should hydrogen peroxide be used in addition to bleach?

If there is a confirmed case of Crypto in the child care center, instead of a bleach solution, use a 3% (99% kill rate) or, if available, 6% (99.9% kill rate) concentration of hydrogen peroxide for cleaning. If for some reason, child care centers are using both bleach and hydrogen peroxide, the surface to which the hydrogen peroxide was applied should be wiped and be completely dry before using bleach. A proper bleach solution, not hydrogen peroxide, should be used for general disinfection in child care centers without Crypto illness.

When is it safe for child care centers to switch back to normal non-hydrogen peroxide cleaning?

It is likely safe to switch back to normal routine cleaners and disinfectants one incubation period (12 days) after resolution of diarrhea and vomiting in child care cases. However, if there is a community-wide outbreak of Crypto, it might be reasonable to continue to use hydrogen peroxide longer than the 12 days.

Where do we find 6% hydrogen peroxide?

Any janitorial or cleaning supply warehouse that supplies hospitals will usually carry 6% hydrogen peroxide. The 6% concentration may also be labeled “20 volume.” A 3% hydrogen peroxide solution may be referred to as a “10 volume” solution.

Is it safe to use child wading pools, water tables, and other water-based activities when there is a case of Crypto?

Child care centers should immediately suspend the use of child wading pools, water tables, and other water-based activities upon learning of a confirmed case of Crypto. All children with diarrhea should be excluded from water-based activities and should remain out of water-based activities for an additional two weeks after diarrhea stops regardless of whether or not they have been treated. In any situation, portable wading pools are strongly discouraged. The American Academy of Pediatrics and the American Public Health Association state, “small portable wading pools do not permit adequate control of sanitation and safety, and they promote the transmission of infectious diseases”.

Are children and/or staff required to have two negative stools before returning to child care centers?

IDPH does not require children or staff confirmed with Crypto to provide two negative stools before returning to child care settings. Both children and staff should remain out of child care settings until diarrhea and vomiting has stopped.

Cryptosporidiosis

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name: Facility phone: ( )- - Type:

Date of Birth: / / Estimated? ☐ Age:

Gender: ☐ Female ☐ Male ☐ Other

Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed

Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Parent/Guardian name:

Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of death / /

Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name:

Exposure setting:

Epi-linked: ☐ Yes ☐ No ☐ Unk To whom

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: Country:

Healthcare provider information

Last name:

First name:

Title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP

Facility name:

Address line 1:

Address line 2:

Zip code: City:

State: County:

Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Cryptosporidium*** Type (e.g. serotype): ☐ *parvum* ☐ *hominis*

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Cryptosporidium*** Type (e.g. serotype): ☐ *parvum* ☐ *hominis*

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final / / Result: ☐ Positive ☐ Negative

Result date: _____

Organism: ***Cryptosporidium*** Type (e.g. serotype): ☐ *parvum* ☐ *hominis*

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Ext: Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Ext: Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admission date: / / Discharge date: / /

Days hospitalized: _____

Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Is case immunosuppressed? ☐ Yes ☐ No ☐ Unk

Symptoms:

☐ Diarrhea	Onset date: / /	Duration: hours/days
☐ Fever	Onset date: / /	Duration: hours/days
☐ Vomiting	Onset date: / /	Duration: hours/days
☐ Abdominal cramps	Onset date: / /	Duration: hours/days
☐ Other	Onset date: / /	Duration: hours/days
☐ Unexplained Weight loss	Weight lost: lbs/Kg	

TREATMENT

Medications prescribed? ☐ Yes ☐ No ☐ Unknown

Medication: _____ Medication: _____ Medication: _____

Date started: / / Date started: / / Date started: / /

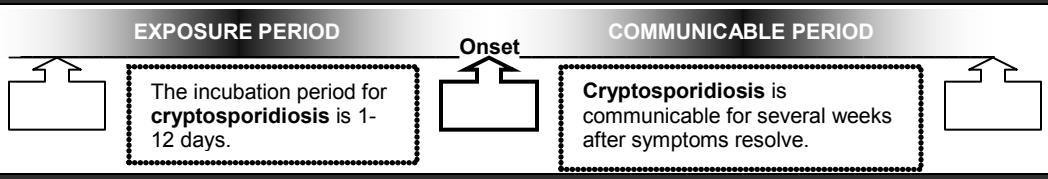
Dose: _____ Dose: _____ Dose: _____

Unit: ☐ mg ☐ ml ☐ IU Unit: ☐ mg ☐ ml ☐ IU Unit: ☐ mg ☐ ml ☐ IU

# of times a day:	Route:	# of times a day:	Route:	# of times a day:	Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risk Factors/Travel Information – *In the 12 days prior to onset of symptoms did the case:*

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Visit restaurants? ☐ Yes ☐ No ☐ Unk *If Yes, complete the table below:*

Establishment name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attended Group Gatherings (e.g. weddings)? ☐ Yes ☐ No ☐ Unk *If Yes, complete the following table:*

Type of gathering	Address/Zip	Date visited	Foods consumed	Foods prepared	Others ill?
		/ /			☐ Yes ☐ No ☐ Unk
		/ /			☐ Yes ☐ No ☐ Unk
		/ /			☐ Yes ☐ No ☐ Unk

Dietary Information – *In the 12 days prior to onset of symptoms did the case consume the following:*

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk — From dates consumed: / / / / — To dates consumed: / / / /

List all source/types: _____ List all brand names: _____

Other unpasteurized milk products: ☐ Yes ☐ No ☐ Unk — From dates consumed: / / / / — To dates consumed: / / / /

List all source/types: _____ List all brand names: _____

Other unpasteurized products (i.e. juice): ☐ Yes ☐ No ☐ Unk — From dates consumed: / / / / — To dates consumed: / / / /

List all source/types: _____ List all brand names: _____

Animal Exposures – *In the 12 days prior to the onset of symptoms did the case have the following exposures:*

Visit or live on a farm: ☐ Yes ☐ No ☐ Unk — Contact with manure: ☐ Yes ☐ No ☐ Unk — Contact with which animals on farm: ☐ Cows ☐ Sheep/goats ☐ Pigs

Visit any animal exhibits (petting zoo, county fair): ☐ Yes ☐ No ☐ Unk — Type of animals at exhibit: ☐ Cows ☐ Sheep/goats ☐ Pigs

Exhibit name: _____ Address/Zip/County: _____

Water Exposures – *In the 12 days prior to the onset of symptoms did the case:*

Go swimming or have contact with recreational types of water? ☐ Yes ☐ No ☐ Unk *If Yes, complete the table below:*

Type		Location Type	Date visited	Facility name/ Street address & Zip
☐ Hot tub/spa ☐ Kiddie pool ☐ River/stream ☐ Lake	☐ Pond ☐ Water park ☐ Swimming pool ☐ Water fountain/ splash pad ☐ Other_____	☐ Hotel/motel ☐ Indoor private ☐ Indoor public ☐ Outdoor private ☐ Outdoor public	/ /	
☐ Hot tub/spa ☐ Kiddie pool ☐ River/stream ☐ Lake	☐ Pond ☐ Water park ☐ Swimming pool ☐ Water fountain/ splash pad ☐ Other_____	☐ Hotel/motel ☐ Indoor private ☐ Indoor public ☐ Outdoor private ☐ Outdoor public	/ /	
☐ Hot tub/spa ☐ Kiddie pool	☐ Pond ☐ Water park	☐ Hotel/motel ☐ Indoor private	/ /	

☐ River/stream ☐ Lake	☐ Swimming pool ☐ Water fountain/ splash pad ☐ Other_______________	☐ Indoor public ☐ Outdoor private ☐ Outdoor public		

Drinking water supply

Home:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**School:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well
Work:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**Child care:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well

Did patient use a water filter at home? ☐ Yes ☐ No ☐ Unk What type: ________________

Other Exposures – *In the 12 days prior to the onset of symptoms*

Wear diapers ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unk

Have contact with immunocompromised person: ☐ Yes ☐ No ☐ Unk Setting: ☐ Home ☐ Work ☐ Other

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

Other risk factors

Do you have a child in child care? ☐ Yes ☐ No ☐ Unk List child care names: ________________________________

____

____

CONTACTS

Number of people living in case's household: _____

Are there close contacts of the case with same symptoms: ☐ Yes ☐ No ☐ Unknown

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

CYCLOSPORA

Also known as: Cyanobacterium-like, coccidia-like, and *Cyclospora*-like bodies (CLBs)
***Cyclospora* infection = cyclosporiasis**

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

This disease is caused by *Cyclospora cayetanensis*, a single cell microscopic protozoan parasite. Humans with cyclosporiasis shed the parasite in a non-infectious form that takes from several days to a couple of weeks to mature into its infectious form. The time required for maturation to the infectious form depends on factors such as temperature and moisture.

B. Clinical Description

This parasite infects the small intestine (bowel) and typically causes watery diarrhea, which can be severe. Other symptoms can include nausea, vomiting, abdominal cramping, gas and bloating, fatigue and loss of appetite, anorexia, weight loss, abdominal pain, myalgias, and low-grade fever. Occasionally, infected individuals may not have any symptoms. Untreated, symptoms may last from several days to several weeks (longer in immunocompromised individuals), and weight loss can be significant (exceeding 20 pounds in some cases).

C. Reservoirs

Humans are the only known reservoir for *Cyclospora cayetanen*sis, however animal reservoirs have been suspected. *Cyclospora* has been found on a variety of fruits and vegetables including lettuce and raspberries.

D. Modes of Transmission

Current knowledge of human cyclosporiasis suggests that it is not likely to be transmitted directly from person-to-person. After being shed in human stool, the parasite must undergo developmental changes (taking days to weeks) before becoming infectious. Humans become infected by consuming food or water that has been contaminated with human feces containing *Cyclospora*.

E. Incubation Period

The incubation period is about 1 - 2 weeks, with an average of 1 week.

F. Period of Communicability or Infectious Period

People may shed *Cyclospora* parasites for days to over one month (while actively ill). It is not known how long the parasite may be shed after symptoms have stopped.

G. Epidemiology

Cyclosporiasis was first recognized in 1979. The parasite appears to be widely distributed throughout the world with a predominant number of cases occurring during the warmer months. *Cyclospora* may be transmitted by ingestion of water or food contaminated with oocysts. Outbreaks linked to contaminated water and fresh produce have been reported in recent years. The largest documented outbreaks of cyclosporiasis in the United States occurred during the summers of 1996 and 1997; a majority of those cases had consumed imported raspberries.

To date, the fresh produce items that have been implicated in U.S. outbreaks include fresh imported raspberries, basil, snow peas, and mesclun lettuce. Persons of all ages are at risk for infection. Persons living or traveling in developing countries may be at increased risk.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify transmission sources of public health concern (e.g., contaminated food or water) and to stop transmission from such sources.
- To provide education about how to reduce the risk of infection.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides ova and parasite testing of stool specimens for *Cyclospora*. Submit specimens in 10% formalin. Specimen collection kits are available from the SHL. Contact the SHL at (319) 335-4500 for further instructions.

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. Individual cases: IDPH will conduct followup.

b. Multiple cases/possible outbreak
If the number of reported cases of cyclosporiasis in a city/town is higher than usual, or if an outbreak is suspected, an investigation is warranted to determine the source of infection and mode of transmission. A common vehicle, such as water or food, should be sought and applicable preventive or control measures should be instituted (*e.g.,* removing an implicated food item from the environment). Consult with an epidemiologist at IDPH or contact your regional epidemiologist

if an outbreak is suspected**.** CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several town lines and therefore be difficult to identify at a local level.

c. If a food or water source is suspect follow-up may include involvement of a representative of the Iowa Department of Inspections and Appeals, Food and Consumer Safety Bureau who are involved in enforcement of the Iowa Food Code.

d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Cyclosporiasis (*Cyclospora* infection) is not identified as a quarantinable disease under Iowa Administrative Code. The following guidelines are recommended.

Minimum Period of Isolation of Patient

Food handlers with confirmed *Cyclospora* infection should be excluded from work. After diarrhea has resolved, food handlers may only return to work after instruction on proper handwashing technique.

Minimum Period of Isolation of Contacts

Contacts with diarrhea who are food handlers shall be considered the same as a case and handled in the same fashion. No restrictions otherwise.

Note: A food handler is any person directly handling or preparing food.

B. Protection of Contacts of a Case

None.

Preventive Measures

Personal Preventive Measures/Education

To avoid infection with *Cyclospora*, recommend that individuals:

- Avoid drinking un-boiled or untreated water when hiking, traveling in developing countries or wherever the water quality is unknown. Bringing water to a full, rolling boil is sufficient to kill *Cyclospora*.
- Thoroughly wash all fresh fruits and vegetables prior to consumption, but this may not eliminate the risk entirely.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Cyclospora can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition.* Illinois, Academy of Pediatrics, 2003.

CDC Website. *Cyclospora* Infection. www.cdc.gov/parasites/cyclosporiasis/epi.html
Heymann, D., ed., *Control of Communicable Diseases Manual, 19th* Edition. Washington, DC, American Public Health Association, 2008.
Soave, Rosemary. *Cyclospora*: An Overview. *Clinical Infectious Diseases,* 1996; 23:429-37.

FACT SHEET *CYCLOSPORA*

Information for Health Professionals

What is Cyclospora?
Cyclospora cayetanensis (*Cyclospora*) is a unicellular parasite formerly known as cyanobacterium-like, coccidia-like, and *Cyclospora*-like bodies (CLBs). Cases have been reported more frequency since the mid-1980s, in part because of the availability of better techniques for detection of the parasite in stool samples.

How is *Cyclospora* transmitted?
Cyclospora is transmitted by a person ingesting water or food that is contaminated with infected stool. Outbreaks linked to contaminated water, and outbreaks linked to various types of fresh produce, have been reported in recent years. It is unknown whether animals can be infected or serve as sources of humans infection.

Cyclospora is not infectious at the time it is excreted in the stool of an infected person. In fact, the parasite does not become infectious until days to weeks after it is excreted (the time depends on factors such as temperature and humidity). Indirect transmission occurs when the stool from an infected person contaminates something in the "environment" (e.g., water) to which someone else is exposed after the parasite has had time to become infectious.

Who gets *Cyclospora*?
Persons of all ages are at risk for infection. Although persons living or traveling in developing countries may be at increased risk. Infections occur worldwide, including North America. The risk may vary by season; some evidence suggests that infection is most common in spring and summer.

What are the symptoms of *Cyclospora*?
Cyclospora infects the small intestine and typically causes illness characterized by watery diarrhea, with sometimes explosive stools. Other symptoms can include loss of appetite, substantial loss of weight, bloating, increased flatus, stomach cramps, nausea, vomiting, muscle aches, low-grade fever, and fatigue. Some persons notice flu-like symptoms before they notice gastrointestinal symptoms. Some infected persons are asymptomatic.

How soon do symptoms appear?
The incubation period is usually about 1 week. If the illness is not treated the person may have a remitting-relapsing course of variable duration, with a range of 9 - 43 days. Persons with weakened immune systems may experience symptoms for a longer period of time if infected.

How can cyclospora infection be treated?
Cyclospora infection can be treated with 7-10 day course of oral trimethoprim-sulfamethoxazole (for adults 160mg trimethoprim plus 800mg sulfamethoxazole twice daily; for children, 5mg/kg trimethoprim plus 25mg/kg sulfamethoxazole twice daily.

How is the infection identified?
Identification of this parasite in a stool requires special kinds of laboratory techniques that are not routinely used. Currently, the most practical diagnostic method consists of the identification of oocysts in stool specimens by light microscopy. Other methods are also available or under investigation. Therefore requests should specify that you are looking for *Cyclospora*. More than one stool sample may need to be checked to find the organism.

Can infection with *Cyclospora* occur more than once?
Yes. Persons who have previously been infected with *Cyclospora* can become infected again.

How can infection with *Cyclospora* be prevented?
Avoiding water or food that may be contaminated with stool may help prevent infection. Infected persons should wash their hands often to prevent the spread of infection. Thoroughly wash fruits and vegetables before eating.

FACT SHEET *CYCLOSPORA*

What is *Cyclospora*?
Cyclospora is a parasite that is too small to be seen with the naked eye. Its full name is *Cyclospora* cayetanensis. Cases of *Cyclospora* infection (cyclosporiasis) have been reported with increased frequency since the mid-1980s. In the last several years, outbreaks of cyclosporiasis have been reported in the United States and Canada.

How is *Cyclospora* spread?
Cyclospora is spread by swallowing water or food that was contaminated with infected stool. For example, outbreaks of cyclosporiasis have been linked to various types of fresh produce. We do not know how common the various ways of spread are. It is unknown if animals can be infected and spread infection to humans.

Cyclospora is not infectious at the time it is passed in bowel movements. The parasite does not become infectious until days to weeks after it is excreted. Because of this, direct person-to-person transmission is unlikely. However, so-called indirect transmission might occur. For example, *Cyclospora* might be spread if stool from an infected person contaminates something in the "environment" (for example, water) to which someone else is exposed after the parasite has had time to become infectious.

Who gets *Cyclospora*?
Persons of all ages are at risk for infection. However people living in or traveling to developing countries may be at increased risk, infections also occur in the United States and Canada. The risk may vary with the season. Evidence suggests that infection is most common in spring and summer.

What are the symptoms of *Cyclospora*?
Cyclospora infects the small intestine (bowel). It typically causes watery diarrhea with frequent possibly explosive stools. Other symptoms can include loss of appetite, weight loss, bloating, increased gas, stomach cramps, nausea, vomiting, tiredness, muscle aches, and low-grade fever. Some persons infected with *Cyclospora* do not develop any symptoms.

How soon do symptoms appear?
The time between being infected and becoming sick is usually about 1 week.

How long will symptoms last?
If left untreated the illness usually lasts for a few days to a month or longer and symptoms may come back one or more times. Persons with weakened immune systems may experience symptoms for a longer period of time if infected with *Cyclospora*.

What should you do if you think you may be infected?
If you think you may be infected with *Cyclospora*, you should see your healthcare provider. Stool specimens will need to be tested to identify the parasite. More than one stool sample may need to be checked to find the parasite.

Can infection with *Cyclospora* occur more than once?
Yes. Persons who have been infected with *Cyclospora* once can become infected again.

How can infection be prevented?
Avoiding water or food that may be contaminated with stool may help prevent *Cyclospora* infection. An infected person should wash their hands often to prevent the spread of infection and thoroughly wash fruits and vegetables before eating.

DIPHTHERIA

Report Immediately by phone

Responsibilities:
Hospital: Report immediately by phone
Lab: Report immediately by phone
Physician: Report immediately by phone
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Diphtheria is caused by toxin-producing *Corynebacterium diphtheriae*, a gram-positive, irregularly-staining bacterium. Not all *Corynebacterium diphtheriae* produce toxin. The four strains or biotypes of *C. diphtheriae* in order of their likelihood to produce toxin are gravis, mitis, intermedius, and belfanti.

B. Clinical Description

Symptoms: Diphtheria has two forms—respiratory and cutaneous. This chapter deals mainly with respiratory diphtheria. Respiratory (nasal, pharyngeal, tonsillar, and laryngeal) diphtheria is typically caused by toxin-producing (toxigenic) strains of *C. diphtheriae*. In the respiratory form of the disease a membrane, usually visible on the throat or tonsils, is formed. Respiratory diphtheria begins 2 - 5 days after infection. Initial symptoms include a sore throat and low-grade fever. Swelling of the neck ("bull-neck") can develop from inflammation, and is a sign of severe disease. Persons can die from asphyxiation if the membrane obstructs breathing. Remote effects of the diphtheria toxin can cause complications including myocarditis (inflammation of the heart muscle) and nerve paralysis. The respiratory form of diphtheria usually lasts several days, but complications can persist for months.

Membranous pharyngitis from nontoxigenic *C. diphtheriae* is also reportable, although disease is usually mild and does not cause systemic complications. The isolation of *C. diphtheriae* from the throat does not necessarily indicate a pathogenic role. Although the frequency with which this occurs is unknown, a small percentage of the population may carry nontoxigenic or toxigenic strains of *C. diphtheriae* without disease symptoms. Rarely, other *Corynebacterium* species (*C. ulcerans* or *pseudotuberculosis*) may produce diphtheria toxin and lead to classic respiratory diphtheria. *Note:* Other pathogens can cause a membrane of the throat and tonsils, including *Streptococcus* species, Epstein-Barr virus and cytomegalovirus, *Candida*, and anaerobic organisms (Vincent's angina).

Onset: The onset is indistinguishable from the common cold, usually characterized by a mucopurulent nasal discharge (containing both mucus and pus), which may become blood-tinged. A white to grayish membrane usually forms on the nasal septum and throat in respiratory disease.

Complications: The severity of the disease and complications are generally related to the extent of local disease. When absorbed, the toxin affects organs and tissues distant from the site of invasion. The most frequent complications of diphtheria are myocarditis and neuritis.

Myocarditis may present as abnormal cardiac rhythms, and can occur early in the course of the illness or weeks later, and lead to heart failure. If myocarditis occurs early, it is often fatal.
Neuritis most often affects motor nerves and usually resolves completely. Paralysis of the soft palate is most frequently seen during the third week of illness. Eye muscles, limbs, and diaphragm paralysis

can occur after the first week. Secondary pneumonia and respiratory failure may result from diaphragmatic paralysis.

Other complications include otitis media, and respiratory insufficiency due to airway obstruction, especially in infants.

The overall case-fatality rate for respiratory diphtheria is 5% - 10%, with higher death rates (up to 20%) in persons <5 and >40 years of age. The case-fatality rate for diphtheria has changed very little during the last 50 years, and is higher for those who have never received vaccine than for those who have been fully immunized.

C. Reservoirs

Humans are the only known reservoir of *C. diphtheria*, which is present in discharges from the nose, throat, and eye and skin lesions for 2 - 6 weeks after infection.

D. Modes of Transmission

Diphtheria is transmitted person-to-person by droplet or direct contact with an infected person's nasopharyngeal secretions. Contact with articles soiled with discharges from cutaneous lesions can be a source, but this has rarely been documented. Raw milk contaminated with *Corynebacterium diphtheriae* has served as a vehicle for transmission.

E. Incubation period

The incubation period is usually 2 - 5 days but may occasionally be longer.

F. Period of Communicability or Infectious Period

The infectious period is variable, typically lasting 2 weeks or less. Antibiotic treatment promptly terminates shedding, usually in less than 4 days; but chronic carriage may occur, even after antimicrobial therapy. Patients are considered infectious until two successive pairs of nose and throat cultures obtained not <24 hours after completion of antimicrobial therapy and $\geq$ 24 hours apart are negative. (See Section 3) B. 2. d [page 5] for more details.) Asymptomatic carriers are important in sustaining transmission. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.

G. Epidemiology

Infection can occur in immunized, partially immunized and unimmunized persons, but it is usually less severe in those who are partially or fully immunized. Diphtheria is endemic in many parts of the world, including countries of the Caribbean and Latin America. The incidence of respiratory diphtheria is greatest in the fall and winter. During the last few years, large epidemics of respiratory diphtheria, primarily in adolescents and adults, have occurred in the former Soviet Union, Algeria, and Ecuador. In the states of the former Soviet Union (including Russia, the Ukraine and Central Asian Republics), more than 150,000 cases and 5,000 deaths from diphtheria occurred between 1990 and 1997. In recent epidemics in the former Soviet Union, the case fatality rate has ranged from 3% to 23%.

While most cases of diphtheria reported recently in the United States were imported, enhanced surveillance in a previously endemic Northern Plains Indian community has revealed ongoing circulation of a toxigenic strain of *C. diphtheriae* first identified in that region in the 1970s. The last reported case in Iowa occurred in 1967. It is estimated that more than 40% of US adults lack protective levels of circulating antitoxin.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify and evaluate contacts and provide necessary antimicrobial prophylaxis to prevent further spread of the disease
- To alert public health authorities to the presence of cases of *C. diphtheriae* and the potential for increased cases development in the area, particularly given the large number of susceptible adults.
- To assure early and appropriate treatment with diphtheria antitoxin and antibiotics.
- To obtain necessary laboratory specimens before antibiotic or antitoxin treatment.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3 stipulates that the laboratory and the healthcare provider must report any suspected or confirmed cases of diphtheria immediately by phone. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736, if calling after business hours, call the Iowa State Patrol Office at (515) 323-4360. They will page a member of the on-call CADE staff.

Laboratory Testing Services Available

After communicating with IDPH, contact the University of Iowa State Hygienic Laboratory (SHL) bacteriology department at (319) 335-4500 for further instructions.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

Diphtheria follow-up and case investigation is undertaken by the Local Public Health Agency (LPHA), and will be coordinated, if necessary, with the IDPH Bureau of Immunization and Center for Acute Disease Epidemiology (CADE).

A healthcare provider and a public, private, or hospital clinical laboratory will assist in a disease investigation conducted by the department, or local health department. A healthcare provider and a public, private, or hospital clinical laboratory will provide the department or local health department with all information necessary to conduct the investigation, including but not limited to medical records, exposure histories, medical histories, contact information, and positive, pending, and negative test results necessary to the investigation.

Initial Questions to Ask Healthcare Providers and Patients

To assess the likelihood that a suspect case is a true case prior to laboratory testing, LPHA or other public health staff should ask about: 1) symptoms, 2) diphtheria immunization history, 3) recent travel history (where and dates), 4) recent out-of-town visitors (from where and dates), and 5) recent contact with anyone with similar symptoms.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

Maintain Droplet Precautions for respiratory diphtheria in healthcare facility or home until two successive pairs of nose and throat cultures obtained not <24 hours after completion of antimicrobial therapy and $\geq$ 24 hours apart are negative. If cultures remain positive contact IDPH, CADE at (800) 362-2736 for further guidance. If there was no antimicrobial therapy, the two sequential pairs of cultures should be taken after symptoms resolve, and $\geq$ 2 weeks after onset. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.

If an avirulent (nontoxigenic) strain is documented, isolation is not necessary.

Minimum Period of Quarantine of Contacts

Contacts whose occupations involve handling food or working with unimmunized children must be excluded from work until two successive pairs of nose and throat cultures, obtained not <24 hours after completion of antimicrobial therapy and ≥ 24 hours apart, are negative. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance. These requirements may be extended to other contacts who work in high-risk settings, as determined by IDPH.

B. Protection of Contacts of a Case

Close contacts are defined as those who sleep in the same house or who share food, drink, or eating/drinking utensils with the case, or otherwise share saliva with case such as child care contacts, and healthcare workers in contact with the case's oral or respiratory secretions. Those contacts that were in brief contact with the case, but do not meet the definition of a close contact, are not considered significant contacts.

Below, management of cases and contacts is divided into four categories: 1) cases, 2) cases and symptomatic close contacts, 3) asymptomatic close contacts, and 4) nonsignificant contacts. It is important to follow the sequence of actions, as administration of antibiotics, diphtheria antitoxin (DAT), and diphtheria toxoids will interfere with interpretation of diagnostic testing. Attachment C (at the end of this chapter) presents these recommendations in diagram form.

1. Case(s)

Place cases of respiratory diphtheria in Droplet Precautions until two cultures from both the nose and the throat are negative for toxigenic *C. diphtheriae*. Material for these cultures should be obtained not <24 hours after completion of antimicrobial therapy and ≥ 24 hours apart. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance. If there was no antimicrobial therapy, the cultures should be taken after symptoms resolve, ≥ 2 weeks after their onset, and ≥ 24 hours apart. Continue as described in Section 2 immediately below.

2. Cases and Symptomatic Close Contacts

a. Do not delay treatment to collect specimens.
b. Collect cultures as described in Attachment A (located at the end of this chapter). If antibiotics have been started, it is useful to collect specimens for PCR and serology, which are described in Attachment B (at the end of this chapter). If possible, serology specimens should be collected *before* administration of diphtheria antitoxin (DAT) or diphtheria toxoid.
c. Treat with appropriate antibiotic, and evaluate cases and symptomatic close contacts for initiation of therapy with DAT. DAT can be obtained from CDC through an Investigational New Drug (IND) protocol. Healthcare providers treating a case of suspected diphtheria can contact IDPH, CADE at (800) 362-2736 for assistance in obtaining DAT. Serology specimens should be collected *before* administration of DAT.
d. If cases or symptomatic close contacts are culture-positive, they will need two repeat pairs of nose and throat cultures obtained not <24 hours after completion of antimicrobial therapy and ≥ 24 hours apart. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance. If a case or symptomatic close contact has not received antibiotics, two successive pairs of nose and throat cultures taken after symptoms resolve, ≥ 2 weeks after the onset of symptoms, and ≥ 24 hours apart are needed. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.
e. Cases and symptomatic close contacts that are not up to date should be immunized with a diphtheria toxoid-containing preparation appropriate for age during convalescence. (Refer to Section 3) D for recommendations on completing the schedule). Remember, serum should be collected before vaccinating.
f. Close contacts should be monitored for symptoms daily for at least 7 days after the last exposure. Active surveillance for suspect cases in affected settings should take place for at least two incubation periods (10 days).

3. **Asymptomatic Close Contacts**
   a. Where diphtheria is confirmed or highly suspected in the case, asymptomatic close contacts should be excluded from work if work involves food or unimmunized children.
   b. Where diphtheria is confirmed or highly suspected in the case, all asymptomatic close contacts should have cultures collected as described in Attachment A (at the end of this chapter).
   c. Assess and monitor for signs and symptoms of diphtheria for at least 7 days.
   d. Assess diphtheria toxoid vaccination status and vaccinate as outlined below:
      - If < 3 doses or unknown administer a dose of diphtheria toxoid (DTaP, DT, or Td as appropriate) and complete primary series according to schedule.
      - If ≥ 3 doses and last dose were >5 years ago, administer a booster dose of diphtheria toxoid.
      - If ≥ 3 doses and last dose was < 5 years ago, children needing their fourth primary dose or booster dose should be vaccinated; otherwise vaccination is not required.

   All close contacts (regardless of culture result or immunization status) should begin antibiotic prophylaxis with oral erythromycin (40-50 mg/kg/day for 7 days, maximum 2 g/day, for children; and 1/g/day for adults. A single IM dose of benzathine penicillin G (600,000 U for persons < 6 years of age and 1,200,000 U for persons ≥ 6 years of age) is an alternative. (The lower dose of penicillin is for patients weighing less than 30 kg.)

   e. All asymptomatic close contacts who were initially culture-positive will need two repeat pairs of nose and throat cultures taken not < 24 hours after antibiotics have been discontinued and ≥ 24 hours apart. If an asymptomatic contact has not received antibiotics, two successive pairs of nose and throat cultures taken ≥ 24 hours apart are needed. If any of the repeat cultures is positive, an additional 10-day course of oral erythromycin should be given and the cultures repeated as described above.
   f. Close contacts should be monitored for symptoms daily for at least 7 days after their last exposure. Active surveillance for suspect cases in affected settings should be conducted for at least two incubation periods (10 days).

4. **Non-Significant Contacts**
   Contacts who do not sleep in the same house as the case; do not share food, drink, or eating/drinking utensils with the case; and are not healthcare workers in contact with the case's oral or respiratory secretions should be immunized with the appropriate diphtheria toxoid-containing preparation as described in Section 3) D above. They do not need to be cultured or placed on antibiotic prophylaxis.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Immunize the largest possible proportion of the population group involved, emphasizing protection of infants and preschool children. In an epidemic involving adults, immunize groups that are most affected and at highest risk. Repeat immunization procedures one month later to provide a second dose.

D. Preventive Measures

Vaccination, including routine childhood vaccination and Td boosters beginning at age 11–12 years and continuing every 10 years thereafter, is the best preventive measure against diphtheria. Tetanus toxoid-containing formulations should always be used. The Advisory Committee on Immunization Practices (ACIP) recommends that all children receive a routine series of five doses of tetanus and diphtheria vaccine at ages 2, 4, 6, 15–18 months, and 4–6 years. Booster doses of diphtheria and tetanus toxoids should be administered beginning at age 11–12 years (provided at least 5 years have passed since the last dose) and every 10 years thereafter. DTaP should be used in persons < 7 years of age, whereas Td is the preferred preparation for persons ≥ 7 years of age.

The Td schedule for those beginning immunization at ≥ 7 years of age consists of 3 doses. The second dose is usually given 1–2 months after the 1st dose and the 3rd dose 6 months after the 2nd dose.

Due to the presence of diphtheria worldwide, it is important for all international travelers to be up to date with DTaP/DT/Td vaccination. Good personal hygiene (which consists of proper handwashing, disposal of used tissues, not sharing eating utensils) and avoiding sick people is important in prevention.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Diphtheria can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Note on Cutaneous diphtheria

Cutaneous diphtheria, caused by either toxigenic or nontoxigenic strains, is usually mild, typically consisting of nondistinctive sore or shallow ulcers, and only rarely involving toxic complications (1-2% of infections with toxigenic strains). Cutaneous diphtheria was removed from the nationally reportable disease list in 1980, but it remains reportable in Iowa.

Place the cutaneous case in contact precautions until two cultures of skin lesions are negative. Material for all these cultures should be taken not <24 hours after cessation of antimicrobial therapy and ≥ 24 hours apart. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance. If there was no antimicrobial therapy, the cultures should be taken after symptoms resolve, ≥ 2 weeks after their onset, and ≥ 24 hours apart.

Work restrictions are the same as for respiratory diphtheria.

References

American Academy of Pediatrics. *Red Book 2003: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, Academy of Pediatrics, 2003.

CDC. Case Definitions for Infectious Conditions under Public Health Surveillance, 2010: www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm

CDC. *Epidemiology & Prevention of Vaccine-Preventable Diseases: The Pink Book, 12th Edition*. CDC, January, 2011.

CDC. *Vaccine-Preventable Disease Surveillance Manual, 4th Edition, 2008-09.* www.cdc.gov/vaccines/pubs/surv-manual/default.htm

Heymann, D., ed. *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

IDPH. *Public Health (641) Chapter 1, Notification and Surveillance of Reportable Communicable and Infectious Diseases, Poisonings and Conditions* (Printed April 2004).

Additional Resources

Manual for the Surveillance of VPDs", Chapter 1: Diphtheria. Available at the following website: www.cdc.gov/vaccines/pubs/surv-manual/default.htm

ATTACHMENTS:

Attachment A: Collection of Specimens for Isolation of *C. diphtheriae* (1 page)

Attachment B: Overview of Requirements for Laboratory Testing for Diphtheria (1 page)

Attachment C: Algorithm for Diagnosis, Treatment, and Follow-Up of Suspect Diphtheria Cases and Infected Contacts
(1 page)

Attachment D: Important Telephone Contacts for Diphtheria Control (1 page)

Attachment A

COLLECTION OF SPECIMENS FOR ISOLATION OF *C. diphtheriae*

Clinical specimens for culture should be obtained as soon as possible when diphtheria of any type is suspected, even if treatment with antibiotics has already begun. Unless the index of suspicion is low, specimens should be collected from the nose and throat of all close contacts of suspected cases. (Culture of *C. diphtheriae* from close contacts may confirm the diagnosis of the case, even if the patient's culture is negative.) Use a dry, sterile swab.

Throat swabs

1. Pharynx should be clearly visible and well illuminated.
2. Depress tongue with an applicator and, Using a dry, sterile swab, swab the throat without touching the tongue or inside of the cheek.
3. Rub vigorously over any membrane, white spots, or inflamed areas; slight pressure with a rotating movement must be applied to the swab.
4. If membrane is present, lift the edge and swab beneath it to reach the organisms deeper in the throat. A portion of the membrane may also be submitted for testing.

Nasopharyngeal specimens

1. Insert the swab into the nose through one nostril beyond the anterior nares.
2. Gently introduce the swab along the floor of the nasal cavity, under the middle turbinate, until the pharyngeal wall is reached. Force must not be used to overcome any obstruction.

Skin diphtheria and other lesions

1. Lesions should be cleansed with sterile normal saline and crusted material removed.
2. Press the swab firmly into the lesion.

- **Place swabs in a transport system. If transport time is anticipated to be < 24 hours, Amies or Modified Stuart's medium is recommended. If transport time is to be ≥ 24 hours, silica gel is recommended. Send specimen overnight, with the attached submission form, to the State Hygienic Laboratory (SHL).**
- **Call the SHL Bacteriology Reference Laboratory at (319) 335-4500 to notify them that specimens for diphtheria culture are on the way, since isolation of *C. diphtheriae* requires special tellurite media.**
- **If *C. diphtheriae* is isolated, regardless of association with disease, SHL staff will arrange for shipment of isolates to the Diphtheria Laboratory, National Center for Infectious Diseases, CDC, as directed by CDC.**

Attachment B

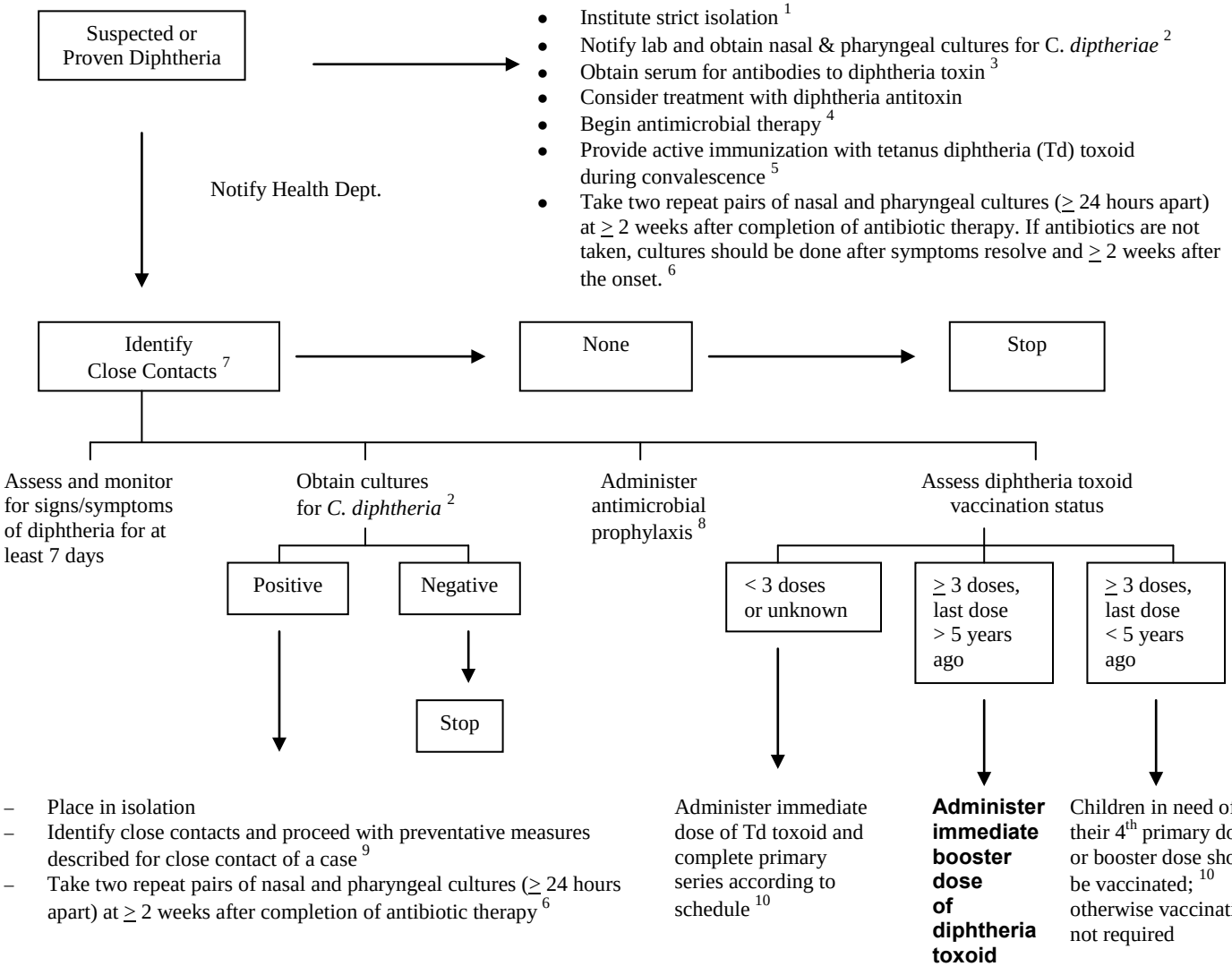
A. Overview of Requirements for Laboratory Testing for Diphtheria					
Test name	**Specimens to take**	**Timing for specimen collection**	**Transport requirements**	**Collection & notification requirements**	**Notes**
Culture	• Swabs of nose, throat, and membrane (or other infected body site) of case • Swabs of nose and throat of close contacts	As soon as possible, when diphtheria is suspected	< 24 hours: Amies or modified Stuart's medium ≥24 hours: silica gel sachets	Physicians or labs call UHL Bacteriology Lab (319) 335-4500 and IDPH Disease Reporting Hotline (800) 362-2736 regarding suspect case. IDPH may call CDC diphtheria lab at (404) 639-1730 or (404) 639-4057	Available at SHL and elsewhere. Alert lab that diphtheria is suspected to ensure that tellurite medium is used. After isolation, biotype (strain) and toxigenicity can be determined.
PCR	Swabs (as above), or pieces of membrane or biopsy tissue of case	As soon as possible, when diphtheria is suspected	Silica gel sachet, or a sterile dry container at 4^0 C	Contact as above	Available only at CDC. Alert lab that diphtheria is suspected so that specific PCR assay is used. Can detect non-viable organisms and toxin gene. Provides supportive evidence for, but not confirmation of, diagnosis.
Toxigenicity testing (Elek test)	Isolate from culture of case (above)	After *C. diphtheriae* has been isolated	Transport medium such as Amies medium or silica gel sachets	Contact as above	Available at SHL, CDC, and elsewhere.
Serology (antibodies to diphtheria toxin)	Serum of case	If possible before administration of antitoxin or vaccine, collect first of paired sera, taken 2-3 weeks apart	Frozen (-20 ^{0}C)		Available only at CDC. If acute antibody levels are low, diphtheria can't be ruled out; if acute levels are high, diphtheria is unlikely to be cause of illness.

Adapted from Manual for the Surveillance of Vaccine-Preventable Diseases, CDC, September 1999, Chapter 19, Table 3.

Attachment C

Algorithm for Diagnosis, Treatment and Follow-up

Suspected Diphtheria Cases and Infected Contacts



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[1] **Maintain isolation until elimination of the organism is demonstrated by negative cultures of two samples obtained at least 24 hours apart and taken ≥ 2 weeks after completion of antimicrobial therapy. If antibiotic therapy is not taken, cultures should be done after symptoms resolve and it is ≥ 2 weeks since their onset.**

[2] Both nasal and pharyngeal swabs should be obtained for culture.

[3] If equine diphtheria antitoxin is needed, contact your State Health Department. Before administration, patients should be tested for sensitivity to horse serum and, if necessary, desensitized. The recommended dosage and route of administration depend on the extent and duration of disease. Detailed recommendations can be obtained from the package insert and other publications.

[4] Antimicrobial therapy is not a substitute for antitoxin treatment. Antimicrobials: 1) Intramuscular procaine penicillin G (25,000 - 50,000 units/kg/day for children and 1.2 million units/day for adults, in two divided doses), or 2) aqueous crystalline penicillin G intramuscularly (100,000 to 150,000 units/kg/day, in four divided doses), or 3) parenteral erythromycin (40-50 mg/kg/day, maximum 2 g/day) have been recommended until the patient can swallow comfortably, at which point oral erythromycin in four divided doses or oral penicillin V (125-250 mg four times per day) may be substituted for a recommended total treatment period of 14 days.

[5] Vaccination with Td toxoid is required because clinical diphtheria does not necessarily confer immunity.

[6] Persons who continue to harbor the organism after treatment with either penicillin or erythromycin should receive an additional 10-day course of oral erythromycin and should submit samples for follow-up cultures.

[7] Close contacts include household members and other persons with a history of direct contact with a case-patient (e.g. caretakers, relatives, or friends who regularly visit the home) as well as medical staff exposed to oral or respiratory secretions of a case-patient.

[8] A single dose of intramuscular benzathine penicillin G (600,000 units for persons < 6 years of age and 1.2 million units for persons ≥ 6 years of age) or a 7- to10-day course of oral erythromycin (40 mg/[kg/d] for children and 1g/d for adults) has been recommended.

[9] Preventive measures may be extended to close contacts of carriers but should be considered a lower priority than control measure for contacts of each case.

[10] Refer to published recommendations for the schedule for routine administration of DTaP.

Adapted from: Farizo KM, Strebel PM, Chen RT, et al. Fatal respiratory disease due to *Corynebacterium diphtheriae*: Case report and review of guidelines for management, investigation, and control. Clin Infect Dis 1993: 16:59-68. As reproduced in : Centers for Disease Control and Prevention. Manual for the Surveillance of Vaccine-Preventable Diseases 1996; 2-9.

Attachment D

Diphtheria Control
Important Telephone Contacts

State Hygienic Laboratory: **(319) 335-4500**
102 Oakdale Campus
Iowa City, Iowa 52242-5002

Center for Acute Disease Epidemiology **(800) 362-2736**
(Epidemiologist-on-call: 24 hours/7 days a week

Disease Reporting Hotline **(800) 362-2736**

The information below is for reference only, contact IDPH to access CDC.

Centers for Disease Control and Prevention:
Child Vaccine-Preventable Disease Branch
Epidemiology and Surveillance Division
National Immunization Program

Dr. Tanja Popovic **(404) 639-1730**
Building 5; Room 346 (Diphtheria Laboratory) **(404) 639-4057 (lab)**

CDC
1600 Clifton Road, Mailstop C02
Atlanta, GA 30333

Diphtheria duty officer **(404) 639-8255**
(Officer available: Monday through Friday, 8:00 am to 4:30 pm)

Diphtheria duty officer **(404) 639-2889**
(Officer available: nights, weekends, holidays)

FACT SHEET DIPHTHERIA

Information for Health Professionals (Cutaneous)

What is cutaneous (skin) diphtheria?
The bacterium *Corynebacterium diphtheriae* causes cutaneous diphtheria.

Who gets cutaneous diphtheria?
This form of diphtheria is more common in temperate climates. In the United States, cutaneous diphtheria most often infects unvaccinated and indigent people, and is secondary to skin trauma or infections.

How is cutaneous diphtheria spread?
Diphtheria spreads person-to-person by indirect or direct contact with infected skin lesions. Transmission in crowded and unsanitary living conditions has also been documented.

What are the symptoms?
Cutaneous diphtheria is characterized by a non-healing, gray ulcer with a demarcated membrane on the skin. Because cutaneous diphtheria is often indistinguishable from other skin diseases, prompt laboratory confirmation of diagnosis is essential.

How long can an infected person spread the bacteria?
The infectious period usually lasts less than 2 weeks without treatment. If persons are treated with antibiotics, communicability lasts fewer than 4 days, but chronic carriage can occur for up to 6 months in rare instances. The infection is no longer communicable when two cultures of the skin lesions taken 24 hours apart, not less than 24 hours after completing antimicrobial therapy are negative.

Can a patient get diphtheria again?
Yes. Ensure that the patient's diphtheria vaccinations are current per established guidelines.

Do the patient's close contacts need diphtheria prophylaxis?
If laboratory results show that the infectious strain of diphtheria produces toxin, administer prophylactic treatment to the patient's close contacts, and monitor their health status. If the strain does not produce toxin, close contact follow-up is unnecessary.

Who is a close contact needing prophylactic treatment?
All who share living space, food, drink, eating utensils, and/or saliva (kissing), with the patient, including child care contacts need prophylactic treatment. Healthcare workers with patient contact are at risk. Those not meeting these criteria do not need prophylactic treatment.

What management is appropriate for household contacts?
All close contacts should have cultures taken from the nose and throat, and should be kept under surveillance for 7 days. A single dose of benzathine penicillin G (IM)(600,000 units for persons less than 6 years of age and 1.2 million units for persons 6 years of age or older), or a 7-10 day course of erythromycin (PO) (40mg/kg/d for children and 1g/d for adults), is recommended.

What isolation procedures are appropriate in the healthcare setting?
Contact Precautions are appropriate for cutaneous diphtheria. In other words, cover the infected skin.

Is there a vaccine to prevent cutaneous diphtheria?
Yes, see the respiratory diphtheria fact sheet for more detailed information.

FACT SHEET DIPHTHERIA

Information for Health Professionals (Respiratory)

What is diphtheria?
Diphtheria is an acute, toxin-mediated disease caused by *Corynebacterium diphtheriae,* which usually presents in two forms: respiratory and cutaneous.

Who gets respiratory diphtheria?
Diphtheria is a rare disease in the United States, primarily because children are usually vaccinated, and because of the apparently low circulation of toxigenic strains of *Corynebacterium diphtheriae*. Most cases occur among unvaccinated or inadequately-vaccinated persons. The age distribution of recent cases and results of serosurveys indicate that many adults in the United States are not protected against diphtheria.

How is respiratory diphtheria spread?
Diphtheria is transmitted person-to-person by droplet or direct contact with nasopharyngeal secretions of an infected person. Contact with articles soiled with discharges from cutaneous lesions of infected people can be a source, but this has rarely been documented. Raw milk has served as a vehicle for transmission.

What are the symptoms of respiratory diphtheria?
Initial symptoms of illness include a sore throat and low-grade fever; Persons may die from asphyxiation when the membrane obstructs breathing. Swelling of the neck ("bull neck") from inflammation can develop and is a sign of severe disease. Remote effects of the diphtheria toxin may cause other complications, including myocarditis (inflammation of the heart), and nerve paralysis. The respiratory form of diphtheria usually lasts several days; complications can persist for months.

How soon do the symptoms appear?
Respiratory diphtheria begins 2 - 5 days after infection.

How long can an infected person spread the virus?
The infectious period typically lasts 2 - 4 weeks after infection. If patients are treated with antibiotics, communicability usually lasts less than 4 days, but chronic carriage may occur, even after antimicrobial therapy. Patients are considered infectious until 2 successive pairs of nose and throat cultures (and cultures of skin lesions in cutaneous diphtheria), obtained not <24 hours after completion of antimicrobial therapy and taken at least 24 hours apart, are negative. Asymptomatic carriers are important in sustaining transmission. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.

How are susceptible staff members impacted after significant exposure to diphtheria?
If the exposure was significant, the exposed susceptible staff member should not provide direct patient care. The person may be reassigned to work with others that are immune, or be relieved from duty until antimicrobial therapy is completed and 2 nasopharyngeal cultures, obtained at least 24 hours apart taken not <24 hours after completion of antimicrobial therapy, are negative. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.

What are the criteria for significant exposure to diphtheria?
Close contacts are defined as those who sleep in the same house, share food, drink, or eating/drinking utensils with the case, child care contacts, and healthcare workers in contact with the case's oral or respiratory secretions. Persons who had brief contact with the case, but do not meet the definition of a close contact, are not considered significant contacts.

What are diphtheria isolation guidelines?
Maintain isolation until two successive pairs of nose and throat cultures (and cultures of skin lesions in cutaneous diphtheria), obtained not <24 hours after completion of antimicrobial therapy and ≥ 24 hours apart, are negative. If cultures remain positive, contact IDPH, CADE at (800) 362-2736 for further guidance.
If there was no antimicrobial therapy, these two sequential pairs of cultures should be taken after symptoms resolve, and ≥ 2 weeks after their onset. If cultures remain positive, contact IDPH, CADE at (800)362-2736. If an avirulent (nontoxigenic) strain is documented, isolation is not necessary.

Can a person get diphtheria again?
Lifelong immunity is usually, but not always, acquired after disease or inapparent infection.

What is the treatment for diphtheria?
After collection of specimens, cases and symptomatic close contacts should begin antibiotic treatment as follows:

- if diphtheria is strongly suspected on the basis of clinical findings, antitoxin should be given immediately after bacteriologic specimens are taken, without waiting for results. Diphtheria antitoxin is available from CDC. Contact the Iowa Department of Public Health, Center for Acute Disease Epidemiology (CADE) at (800) 362-2736for assistance.
- erythromycin parenterally (40 to 50 mg/kg/day, maximum 2 g/day) until patient can swallow comfortably, at which point either oral erythromycin in 4 divided doses or oral penicillin V, 125–250 mg 4 times a day, may be substituted, for a total treatment period of 14 days; **or**
- aqueous crystalline penicillin G intramuscularly (100,000 to 150, 000 U/kg/day, in four divided doses) for 14 days; **or**
- aqueous procaine penicillin intramuscularly (25,000 to 50,000 U/kg/day, maximum 1.2 million U, in two divided doses for children and 1.2 million U for adults) for 14 days.

Is there a vaccine to prevent diphtheria?
Yes, there is a vaccine to protect against diphtheria.

Vaccination, including routine childhood vaccination and Td boosters beginning at age 11–12 years and continuing every 10 years thereafter, is the best preventive measure against diphtheria. Tetanus toxoid-containing formulations should always be used. The Advisory Committee on Immunization Practices (ACIP) recommends that all children receive a routine series of five doses of tetanus-and diphtheria-containing vaccine at ages 2, 4, 6, 15–18 months, and 4–6 years. Booster doses of diphtheria and tetanus toxoids should then be administered beginning at age 11–12 years (provided at least 5 years have passed since the last dose) and every 10 years thereafter. One of these booster doses should be Tdap (tetanus, diphtheria, and acellular pertussis) vaccine. DTaP and DT should be used in persons < 7 years of age, whereas Td is the preferred preparation for persons ≥ 7 years of age.

The Td catch-up schedule for those starting immunization at ≥ 7 years of age consists of 3 doses. The second dose is usually given 1–2 months after the 1st dose, and the 3rd dose 6 months after the 2nd dose.

FACT SHEET

DIPHTHERIA

(Cutaneous - skin)

What is cutaneous (skin) diphtheria?
Cutaneous diphtheria is a skin disease caused by the same bacterium *that causes respiratory diphtheria*.

Who gets skin diphtheria?
Skin diphtheria is more common in warm climates. In the United States, skin diphtheria most often infects unvaccinated and homeless people.

How is skin diphtheria spread?
Skin diphtheria spreads by contact with infected skin, and in crowded, dirty homes.

What are the symptoms?
The sign of skin diphtheria is a non-healing, gray bump on the skin; but sometimes people can't tell the difference between it and other skin diseases.

Can others get this disease?
Yes: The disease can spread for up to 2 weeks without medicine. With medicine, the disease stops spreading in 4 days. To be sure that others won't get sick, the skin infection must pass two lab tests after someone has finished proper medication.

How can I prevent others from getting sick?
Cover the infected area with a bandage. Wash hands with soap and water after touching the infected area.

Can I get skin diphtheria again?
Yes: unless you get vaccinated for diphtheria after infection.

If I'm sick with skin diphtheria, does my family need medicine also?
Yes. All those who live in the same home and/or share food, drink, eating utensils, or saliva (e.g. kissing) need medicine to prevent illness, even if they received the vaccine.

What is the best way to prevent skin diphtheria?
Vaccination! Most Americans are vaccinated for diphtheria in childhood. However, adults need to receive "booster" shots once every ten years. Ask your doctor whether your diphtheria vaccine is current.

FACT SHEET

DIPHTHERIA
(Respiratory)

What is diphtheria?
Diphtheria is an acute disease with two main forms: respiratory and skin.

Who gets respiratory diphtheria?
Diphtheria is a rare disease in the United States, primarily because children are usually well vaccinated. Most cases occur among unvaccinated or inadequately vaccinated persons.

How is respiratory diphtheria spread?
Diphtheria is transmitted person-to-person by direct or indirect contact with the nose secretions of an infected person. Contact with clothing soiled with discharges from skin sores can cause illness, but this happens rarely. Some people have become ill after drinking raw milk.

What are the symptoms of respiratory diphtheria?
Initial symptoms of illness include a sore throat and low fever; persons may die because they can't breathe when the membrane obstructs the throat. Swelling of the neck ("bull neck") from inflammation can develop and is a sign of severe disease. Other possible symptoms include inflammation of the heart muscle and nerve paralysis. The respiratory form of diphtheria usually lasts several days; complications can persist for months.

How soon do the symptoms appear?
Respiratory diphtheria begins 2 - 5 days after infection.

How long can an infected person spread the virus?
A person is typically infectious 2 weeks or less. Persons who are treated with antibiotics are usually contagious for less than 4 days, but may carry the disease even after being treated. Persons are considered infectious until two nose and throat cultures (and cultures of skin lesions if present) are taken

What are the criteria for significant exposure to diphtheria?
Close contacts are defined as those who sleep in the same house or who share food, drink, or eating/drinking utensils with the case, child care contacts, as well as healthcare workers in contact with the case's oral or respiratory secretions. Those contacts that were in brief contact with the case, but do not meet the definition of a close contact are not considered significant contacts.

Can a person get diphtheria again?
Lifelong immunity is usually, but not always, acquired after disease.

What is the treatment for diphtheria?
After collection of specimens, cases and symptomatic close contacts should begin antibiotic treatment as follows:

Is there a vaccine to prevent diphtheria?
Yes, there is a vaccine to protect against diphtheria. Vaccination, including routine childhood vaccination and Td boosters beginning at age 11 – 12 years and continuing every 10 years thereafter, is the best preventive measure against diphtheria.

List all Contacts

Name	**Address/phone number** (if different than case)	**7 day surveillance Completion date**	**PEP given Y/N**	**Date Diphtheria vaccine given**	**Date specimens obtained**	**Nose and throat swab results**	**Exclude from work if food preparer or work with children until known culture negative**	**Date Returned to work**

Diphtheria

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Disease Type ☐ Cutaneous ☐ Respiratory
Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness
Date of Death / /
Event exception ☐ Unknown ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other
Organism:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative ☐ Other
Organism:

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Test type: _____

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ☐ Other _____

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms (check all that apply):

☐ Bloody nasal discharge ☐ Fever ☐ Skin ulcers ☐ Stridor

☐ Draining ears ☐ Pharyngeal membrane ☐ Sore throat ☐ Swollen lymph nodes

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic: _____

Date started: / /

Dose: _____

Unit: ☐ mg ☐ ml ☐ IU

# of days: _____ # of times a day: _____

Route: _____

Antibiotic: _____

Date started: / /

Dose: _____

Unit: ☐ mg ☐ ml ☐ IU

# of days: _____ # of times a day: _____

Route: _____

Antibiotic: _____

Date started: / /

Dose: _____

Unit: ☐ mg ☐ ml ☐ IU

# of days: _____ # of times a day: _____

Route: _____

Antitoxins prescribed? ☐ Yes ☐ No ☐ Unk

Date started: / /

Dose: _____

Unit: ☐ mg ☐ ml ☐ IU

# of days: _____ # of times a day: _____

Route: _____

Therapeutic medications prescribed? ☐ Yes ☐ No ☐ Unk

List Medications: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.

EXPOSURE PERIOD

Average incubation period for **diphtheria** is 2-5 days; occasionally longer.

Onset

COMMUNICABLE PERIOD

Diphtheria is communicable for ~2 weeks or less. The rare chronic carrier may shed organisms for 6 months or more.

RISK FACTORS/TRAVEL

Vaccinated for diphtheria ☐ Yes ☐ No

Date vaccinated: / /

Lot #: _____

Vaccine type: _____

Manufacturer: _____

Date vaccinated: / /

Lot #: _____

Vaccine type: _____

Manufacturer: _____

Number of vaccinations: ____

In the 7 days prior to the onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Worked with a Case: ☐ Yes ☐ No ☐ Unk — From date: / / To date: / /

Lived with another Case: ☐ Yes ☐ No ☐ Unk — From date: / / To date: / /

Close contact with someone with similar symptoms: ☐Yes ☐No ☐ Unk

Treated for nasopharyngeal symptoms: ☐Yes ☐No ☐ Unk

CONTACTS

Number of people living in case's household: ____

Close contacts with similar symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child	☐ Sexual contact ☐ Family member (non-household)		/ /	☐ Yes

☐ Sibling	☐ Friend/acquaintance	☐ No
☐ Roommate	☐ Contact- work/school/etc	_____
☐ Parent/ guardian	☐ Unknown/Other	

If this contact is a case create a new event and/or case for this contact.

Notes: _____

Diseases E-F

ENCEPHALITIS (ARBOVIRAL)

Potential Bioterrorism Agent: Category B

Includes: St. Louis Encephalitis (SLE), Eastern Equine Encephalitis (EEE), Western Equine Encephalitis (WEE), LaCrosse Encephalitis (LAC), and West Nile Virus (WNV).

Responsibilities:
Hospital: Report by IDSS, facsimile, mail, or phone
Hospital Infection Preventionist: Follow-up required
Lab: Report by IDSS, facsimile, mail, or phone
Physician: Report by facsimile, mail, or phone
Local Public Health Agency (LPHA): Follow-up Required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

There are hundreds of viruses worldwide that are spread through insects or other arthropods. More than 30 of these arboviruses have been identified as human pathogens in the Western Hemisphere. In Iowa, four mosquito-borne arboviruses that cause encephalitis in humans have been identified: LaCrosse encephalitis (LAC), St. Louis encephalitis (SLE), Western Equine encephalitis (WEE), and West Nile virus (WNV).

B. Clinical Description

Encephalitis is an inflammation of the brain. Arboviral infection may result in an acute febrile illness of variable severity and rate of progression associated with neurologic symptoms ranging from headache to aseptic meningitis (inflammation of the linings of the brain and spinal cord) to encephalitis. Many arboviral infections are asymptomatic. Arboviral encephalitis cannot be distinguished clinically from many other causes of encephalitis. Manifestations can include headache, confusion, lethargy, nausea, altered consciousness, vomiting, fever, cranial nerve palsies, paresis (muscular weakness) or paralysis, sensory deficits, altered reflexes, tremors, convulsions, abnormal movements, coma of varying degree, and, in some cases, death. Case-fatality rates range from less than 1% - 60%.

LAC encephalitis initially presents as a nonspecific summertime illness with fever, headache, nausea, vomiting and lethargy. Severe disease occurs most commonly in children under the age of 16 and is characterized by seizures, coma, paralysis, and a variety of neurological sequelae after recovery. Death from LAC encephalitis occurs in less than 1% of clinical cases. In many clinical settings, pediatric cases presenting with central nervous system (CNS) involvement are routinely screened for herpes or enteroviral etiologies. Since there is no specific treatment for LAC encephalitis, physicians often do not request the tests required to specifically identify LAC virus, and the cases are reported as aseptic meningitis or viral encephalitis of unknown etiology.

Less than 1% of SLE viral infections are clinically apparent and the vast majority of infections remain undiagnosed. Illness ranges in severity from a simple febrile headache to meningoencephalitis, with an overall case-fatality ratio of 5% - 15 %. The disease is generally milder in children than in adults,

but in those children who do have disease, there is a high rate of encephalitis. The elderly are at highest risk for severe disease and death.

WNV can infect a wide range of vertebrates; in humans it usually produces either asymptomatic infection or mild febrile disease, but can cause severe and fatal infection in a small percentage of patients. With WNV infections, mild infections are common and include fever, headache, and body aches, often with a skin rash and swollen lymph glands. More severe infections are often associated with high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis, and rarely, death. Case-fatality rates for WNV range from 3% - 15% of cases with clinical encephalitis. For more information on WNV see the WNV section in this manual.

Most arboviral infections are asymptomatic. Clinical disease ranges from mild febrile illness to severe encephalitis. For the purposes of surveillance and reporting, based on their clinical presentation, arboviral disease cases are often categorized into two primary groups: neuroinvasive disease and non-neuroinvasive disease.

Neuroinvasive disease

Many arboviruses cause neuroinvasive disease such as aseptic meningitis, encephalitis, or acute flaccid paralysis (AFP). These illnesses are usually characterized by the acute onset of fever with stiff neck, altered mental status, seizures, limb weakness, cerebrospinal fluid (CSF) pleocytosis, or abnormal neuroimaging. AFP may result from anterior ("polio") myelitis, peripheral neuritis, or post-infectious peripheral demyelinating neuropathy (i.e., Guillain-Barré syndrome). Less common neurological manifestations, such as cranial nerve palsies, also occur.

Non-neuroinvasive disease

Most arboviruses are capable of causing an acute systemic febrile illness (e.g., West Nile fever) that may include headache, myalgias, arthralgias, rash, or gastrointestinal symptoms. Rarely, myocarditis, pancreatitis, hepatitis, or ocular manifestations such as chorioretinitis and iridocyclitis can occur.

C. Reservoirs

LAC virus is a zoonotic pathogen cycled between the daytime-biting treehole mosquito, *Aedes triseriatus*, and vertebrate amplifier hosts (chipmunks, tree squirrels) in deciduous forest habitats. The virus is maintained over the winter by transovarial transmission in mosquito eggs. If the female mosquito is infected, she may lay eggs that carry the virus, and the adults coming from those eggs may be able to transmit the virus to chipmunks and humans.

During the summer season, SLE virus is maintained in a mosquito-bird-mosquito cycle, with periodic amplification by peridomestic birds and *Culex* mosquitoes. In Florida, the principal vector is *Cx. nigripalpus*, in the Midwest, *Cx. pipiens* and *Cx. p. quinquefasciatus* and in the western United States, *Cx. tarsalis* and members of the *Cx. pipiens* complex.

Birds carry WNV. The virus usually stays in birds and the mosquitoes that feed on them. Rarely, other kinds of mosquitoes that also bite people and horses pick up the viruses. Humans and horses are generally considered dead-end hosts. WNV is transmitted principally by *Culex* species mosquitoes, but also can be transmitted by *Aedes*, *Anopheles*, and other species.

D. Modes of Transmission

The bite of an infected mosquito transmits the four types of arboviral encephalitis found in Iowa. WNV can also be transmitted by blood transfusion. See the WNV chapter for further information.

E. Incubation period

Incubation period for LaCrosse (LAC), Eastern Equine Encephalitis (EEE), Saint Louis Encephalitis (SLE) and West Nile Encephalitis (WNV) is 5 - 15 days.

F. Period of Communicability or Infectious Period

The arboviral encephalitides are not communicable from person-to-person.

G. Epidemiology

LaCrosse (LAC) encephalitis was discovered in La Crosse, Wisconsin in 1963. Since then, the virus has been identified in several Midwestern and Mid-Atlantic states. During an average year, 80-100 cases of LAC encephalitis are reported in the U.S. to the Centers for Disease Control and Prevention (CDC).

Western equine encephalitis (WEE) was first isolated in the United States in 1930. In 1941, a U.S. WEE epidemic involved 300,000 horses and 3,340 humans. Since then, occasional smaller epidemics have occurred.

St. Louis encephalitis (SLE) is the leading cause of epidemic flaviviral encephalitis in the U.S. SLE is the most common mosquito-transmitted human pathogen in the U.S. While periodic SLE epidemics have occurred only in the midwest and southeast, SLE virus is distributed throughout the lower 48 states. Since 1964, case numbers have fluctuated widely and there have been more than 4,000 confirmed cases of SLE with an average of 100 cases per year (range 2 - 1,967).

WNV was first isolated in the West Nile Province of Uganda in 1937. The first recorded epidemics occurred in Israel during 1951-1954 and in 1957. Epidemics have been reported in Europe in the Rhone delta of France in 1962 and in Romania in 1996. The largest recorded epidemic occurred in South Africa in 1974.

An outbreak of arboviral encephalitis in New York City and neighboring counties in New York state in late August and September 1999 was confirmed as caused by West Nile virus based on the identification of virus in human, avian, and mosquito samples. By the end of October 1999, WNV had been confirmed in multiple native species of birds from New York City and areas within a 200-mile radius. WNV has also been found to cause encephalitis in horses. By 2006, WNV had spread to 48 states in the United States. The first human case of WNV occurred in Iowa in 2002: a total of 37 human cases were reported in 2006. There were 31 cases of WNV reported in Iowa in 2012.

Over the last 10 years Iowa has averaged 2 cases of arboviral encephalitis other than West Nile per year.

H. Bioterrorism Potential

Category B Agent. Eastern Equine encephalitis (EEE) virus, is recognized as a category B bioterrorism agent by the CDC because it is moderately easy to disseminate, results in moderate morbidity rates and relatively high mortality rates; and requires specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify cases of WNV infection to understand the epidemiology of this emerging disease in our area.
- To identify locally acquired cases of LaCrosse infection in humans to better understand the local epidemiology of LaCrosse virus.
- To help target mosquito control measures.
- To identify cases of other arboviral infections (*e.g.,* California encephalitis, St. Louis encephalitis) in Iowa residents or visitors to determine whether they are imported or locally acquired.
- To provide residents of Iowa and travelers to the state with appropriate preventive health information.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the clearinghouse. Call (319) 398-5133 or visit: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

If the patient is hospitalized at the time of diagnosis, the hospital's Infection Preventionist (IP) may need to assist with the investigation.

Laboratory Testing Available

Arboviral Infections (WEE, EEE, SLE, WNV) The University of Iowa State Hygienic Laboratory (SHL) performs antibody detection for arboviral infections (SLE, WEE, EEE) using immunofluorescent assay (IFA) methods and will be performed on specimens submitted for the arboviral panel and are negative for WNV IgM. Single acute sera are tested for the presence of IgM antibodies to arboviruses and, if found, usually indicates recent infection. IgG testing is not routinely performed unless indicated by case. Confirmatory testing, if indicated, is performed at CDC. Accurate information about date of specimen collection, date of onset of symptoms, travel history, vaccination and disease history are helpful for test result interpretation. For information on specimen submission and testing, contact SHL at (319) 335-4500. Additional information, test request forms, and sample collection instructions can be found at the SHL web site at: www.shl.uiowa.edu/

West Nile Virus

The University of Iowa State Hygienic Laboratory (SHL) performs antibody detection for West Nile virus using enzyme immunoassay (EIA) methods. This method will be performed on all specimens submitted for WNV testing. Single acute sera and cerebrospinal fluid (CSF) are tested for the presence of IgM antibodies. WNV antibodies develop soon after onset and peak around 8 day, therefore, sera and CSF collected 5-10 days post onset are ideal specimens for testing. The presence of IgM antibody usually indicates recent infection by this virus; however, it has been shown that IgM antibodies to WNV may persist for many months after onset. IgG testing is not routinely done. Confirmatory testing, if indicated, is performed at CDC. Accurate information about date of specimen collection, date of onset of symptoms, travel history, vaccination and disease history are helpful for test result interpretation. For information on specimen submission and testing contact SHL at (319) 335-4500. Additional information and test request forms and sample collection instructions can be found at the SHL web site at: www.shl.uiowa.edu/

C. Local Public Health Agency Responsibilities

1. Reporting Requirements

IDPH stipulates that local public health agencies (LPHA) must report the occurrence of any case of arboviral encephalitis.

2. Case Investigation

LPHAs may initiate the follow-up on reported cases of arboviral encephalitis. Due to the significant morbidity and mortality associated with symptomatic illness individuals are likely to be hospitalized at the time of diagnoses. The LPHA should work with the infection preventionist (IP) at the hospital to

complete the Iowa Disease Surveillance System (IDSS) investigation concerning WNV. Epidemiologists with IDPH/CADE are available 24 hours a day to provide assistance and consultation regarding case investigation. Please contact IDPH/CADE at (800) 362-2736 with any questions.

a. Case investigation of arboviral encephalitis in Iowa residents will be directed by the LPHA.
   1) The LPHA may be asked to assist in completing an IDSS arbovial encephalitis case followup by interviewing the case and others who may be able to provide pertinent information. Most of the information required can be obtained from the patient, healthcare provider, or the medical record.

b. It is preferred to use IDSS to report cases and submit followup information. If IDSS is unavailable, print and complete the IDSS form and fax or mail (in an envelope marked "Confidential") to IDPH Center for Acute Disease Epidemiology. The confidential fax number is (515) 281-5698. The mailing address is:

   IDPH, CADE
   Lucas State Office Building, 5th Floor
   321 E. 12th Street
   Des Moines, IA 50319-0075

c. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and if necessary, institute the control guidelines listed below in Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

For most cases of encephalitis there are no isolation and quarantine requirements. However, for encephalitis caused by an organism that is otherwise reportable, please refer to the chapter of that specific organism or disease for the appropriate isolation and quarantine requirements.

B. Protection of Contacts of a Case

In most cases of encephalitis, there are no recommendations for protection of contacts of a case. There is no approved vaccine available, and transmission from person-to-person and animal-to-person (except from ratites, ostriches and emus) does not occur.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If an outbreak is suspected, contact the Center for Acute Disease Epidemiology (CADE) at (800) 362-2736. The situation may warrant an investigation of clustered cases or implementation of effective prevention and control measures (*e.g.,* spraying for mosquitoes). CADE can help determine a course of action to prevent further cases and can perform surveillance for cases across town lines and therefore be difficult to identify at a local level.

D. Preventive Measures

Surveillance

In Iowa, CADE, SHL, Iowa State University, and the Iowa Department of Agriculture and Land Stewardship conduct environmental surveillance of mosquitoes, sentinel chickens, through dead bird collection and testing and the reporting of WNV and EEE positives in domestic and wildlife species in several sites throughout the state. Results of these surveillance efforts are used to detect presence of the virus to help target prevention and control messages throughout the state.

CADE in cooperation with other state agencies may provide guidance in the use of pesticides for the control of mosquitoes. Decisions about the need for mosquito pesticide spraying are normally made by local cities and towns based on mosquito habitat and density, surveillance for LAC, SLE, and WNV in mosquitoes, numbers of cases in birds and other animals, and numbers of cases in humans.

Environmental Measures

Make sure there are good screens on windows and doors to keep mosquitoes out. Get rid of mosquito breeding sites by emptying standing water from flowerpots, buckets, barrels and children's wading pools when not in use. Change the water in pet dishes and replace the water in birdbaths every 3-4 days. Drill holes in tire swings so water drains out.

Personal Preventive Measures/Education

People, are encouraged to protect themselves from mosquito bites. When outdoors, use insect repellents such as those containing DEET (N, N-diethyl-meta-toluamide) and follow the directions on the package. DEET is the most effective insect repellent available. The more DEET a repellent contains the longer it will be effective. DEET concentrations higher than 50% do not increase the length of protection. Repellants containing picaridin and oil of leman eucalyptus have also been found to be effective. Use repellents at the lowest effective concentration. Wash treated skin with soap and water after returning indoors. Wear long-sleeved shirts, long pants, and socks when possible. Spray clothing with products containing DEET or permethrin, as mosquitoes may bite through thin clothing. Permethrin should only be used on clothing; do not apply it directly to skin. Wash treated clothing before wearing it again. Many mosquitoes are most active at dusk and dawn; consider staying indoors during these hours. Persons should also use gloves when handling horses and birds that are sick with or have died from arboviral infection. Persons in the environment of ratites (emus, ostriches, rheas) infected with EEE should take strict precautions when handling sick or dead animals or their secretions/excretions.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for arboviral encephalitis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Comment

Because closely related arboviruses exhibit serologic cross-reactivity, positive results of serologic tests using antigens from a single arbovirus can be misleading. In some circumstances (e.g., in areas where two or more closely related arboviruses occur, or in imported arboviral disease cases), it may be epidemiologically important to attempt to pinpoint the infecting virus by conducting cross-neutralization tests using an appropriate battery of closely related viruses. This is essential, for example, in determining that antibodies detected against St. Louis encephalitis virus are not the result of an infection with West Nile (or dengue) virus, or vice versa, in areas where both of these viruses occur. Because dengue fever and West Nile fever can be clinically indistinguishable, the importance of a recent travel history and appropriate serologic testing cannot be overemphasized. In some persons, West Nile virus-specific serum IgM antibody can wane slowly and be detectable for more than one year following infection. Therefore, in areas where West Nile virus has circulated in the recent past, the co-existence of West Nile virus-specific IgM antibody and illness in a given case may be coincidental and unrelated. In those areas, the testing of serially collected serum specimens assumes added importance.

The seasonality of arboviral transmission is variable and depends on the geographic location of exposure, the specific cycles of viral transmission, and local climatic conditions. Reporting should be etiology-specific (see below; the six diseases printed in bold are nationally reportable to CDC):

- **St. Louis encephalitis virus disease**
- **West Nile virus disease**
- **Powassan virus disease**
- **Eastern equine encephalitis virus disease**
- **Western equine encephalitis virus disease**
- **California serogroup virus disease** (includes infections with the following viruses: California encephalitis, Jamestown Canyon, Keystone, La Crosse, snowshoe hare, and trivittatus)

Note: Due to the continued risk of unintentional or intentional introduction of exotic arboviruses into the United States (e.g., Venezuelan equine encephalitis virus), or the reemergence of indigenous epidemic arboviruses (e.g., St. Louis encephalitis and western equine encephalitis viruses), physicians and local public health officials should maintain a high index of clinical suspicion for cases of potential exotic or unusual arboviral etiology, and consider early consultation with arboviral disease experts at state health departments and CDC.

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Moellering, R. *Infectious Disease Clinics of North America: Animal- Associated Human Infections*. Philadelphia, W.B. Saunders Co., 1991.
ProMED Mail Website. West Nile Virus, Bird-to-Bird Transmission. Documents: 20001026.1856; 20001028.1879; 20001030.1892; 20001102.1901. Available at: < www.promedmail.org/pls/askus/f?p=2400:1000 >. Accessed December 2000.

Additional Resources

Additional information regarding EEE, pesticide use, occupational exposures and other topics may be obtained using the following websites:
Centers for Disease Control and Prevention www.cdc.gov/EasternEquineEncephalitis/index.html
Centers for Disease Control and Prevention www.cdc.gov/ncidod/dvbid/westnile/index.htm
Centers for Disease Control and Prevention www.cdc.gov/lac/
Centers for Disease Control and Prevention www.cdc.gov/sle/
Centers for Disease Control and Prevention www.cdc.gov/ncidod/dvbid/arbor/weefact.htm
Environmental Protection Agency www.epa.gov/pesticides/factsheets/chemicals/deet.htm
U.S. Department of Labor/OSHA www.osha.gov/dts/shib/WestNileVirus_8-29-03.pdf

FACT SHEET ARBOVIRUSES

(LaCrosse, St. Louis, and Eastern Equine Encephalitis)

What are arboviruses?
Arboviruses are those viruses transmitted by mosquitoes. "Arbo" is a shortened form of "arthropod-borne" meaning transmitted by arthropods, which are insects. There are four arboviruses in Iowa: LaCrosse encephalitis, St. Louis encephalitis, western equine encephalitis, and West Nile virus. West Nile virus is addressed in a separate fact sheet.

What are the symptoms of an infection with arboviruses?
Arboviruses infect the brain and may cause it to swell. However, most infected people will not develop any symptoms. A few will develop fever, headache, stiff neck, and lethargy or sleepiness.

How is the disease diagnosed?
Two blood tests, spaced 2 - 4 weeks apart are required to confirm the diagnosis. However, your doctor may diagnose these diseases based on symptoms.

How soon do symptoms appear?
Symptoms usually occur between 5 – 15 days after being bitten by an infected mosquito.

What are the complications of arboviral infections?
Severe infections may result in mental confusion, nervous movements, coma, and occasionally convulsions. Approximately 1% of ill patients will experience permanent brain damage or die.

How are these viruses spread?
Mosquitoes pick up the virus from feeding on infected birds and small wild animals. Then these mosquitoes bite humans and transfer the virus to them. Western equine virus can also infect horses. Infected humans and horses do not directly pass the virus to other humans and horses.

Who gets arboviral infections?
Anyone can get them, depending on exposure to mosquitoes.

How long is a person infectious?
Arboviruses are not spread person to person.

What is the treatment for this illness?
There is no specific treatment. General treatment is given to reduce pain and control swelling of the brain. After having an infection, usually you cannot get it again.

Do infected people need to be excluded from school, work, or child care?
No.

What can be done to help prevent the spread of these viruses?
Protect yourself from mosquitoes by properly screening windows in homes and use of repellents containing DEET (N, N-diethyl-m-toluamide) when outside. The use of large amounts of DEET on small children may cause them to become ill and have seizures. Read and follow directions on all repellents. Since mosquitoes reproduce in water, drain water from containers around homes that collect rain such as tires, ponds and trash receptacles. Reducing stagnant standing water is the most effective way of controlling mosquito numbers. In serious situations communities may spray chemicals to kill mosquitoes or their larvae. There is no vaccine for protection against arboviral diseases.

FACT SHEET Western Equine Encephalitis

What is Western Equine Encephalitis?
Western Equine Encephalitis (WEE) is a mosquito-borne viral disease. WEE is a member of the family *Togaviridae,* genus *Alphavirus*. WEE occurs in the western parts of the United States, including Iowa and Canada. The word Equine means “horse”.

How is WEE transmitted?
WEE virus is transmitted to humans by the bite of an infected mosquito. Mosquitoes acquire the virus from infected birds and can spread this to people and horses.

What are the signs and symptoms of WEE?
Most infections do not have any symptoms or may present as mild, nonspecific illness. For those that develop illness, there is usually a sudden onset of symptoms with fever, headache, nausea, vomiting, loss of appetite and extreme tiredness. This can also be followed by confusion, weakness and signs and symptoms of encephalitis. Symptoms can range from mild flu-like illness to severe encephalitis, coma and death. Serious illness is most common in young children. WEE causes “sleeping sickness” in horses especially in young horses.

How soon after infection do symptoms occur?
Symptoms usually occur between 5 – 15 days after being bitten by an infected mosquito.

How can WEE be prevented?
Avoiding the bite of mosquitoes is the best way to prevent infection with WEE, West Nile virus and other illnesses carried by mosquitoes. Remove standing water from your property. Emptying unused buckets, covering stored tires, and replacing the water in birdbaths weekly are all effective ways to reduce mosquito-breeding pools. Wear lightweight long sleeved shirts and long pants when outdoors to reduce the amount of exposed skin. Use insect repellents containing DEET (N, N-diethyl-meta-toluamide) according to the directions on exposed skin and clothing. A vaccine is available for horses but not humans.

Eastern Equine Encephalitis (EEE)

Investigator: ____

Agency: ____ **Phone number:** ____

FOR STATE USE ONLY

Status: ☐ Confirmed ☐ Suspect ☐ Probable ☐ Not a case

Reviewer initials:

Referred to another state:

CASE

Last name: ____

First and middle name: ____

Maiden name: ____ Suffix: ____

Address line: ____

Zip: ____ City: ____

State: ____ County: ____

Long-term care resident: ☐ Yes ☐ No ☐ Unknown

Facility name: ____

Facility phone: ( )- - Type: ____

Date of Birth: / / Estimated? ☐ Age: ____

Gender: ☐ Female ☐ Male ☐ Other ____

Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Marital status: ☐ Single ☐ Married ☐ Parent with partner ☐ Separated ☐ Widowed

Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Parent/Guardian name: ____

Parent/Guardian phone: ( )- - Type: ____

EVENT

Onset date: / / Diagnosis date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name: ____

Exposure setting: ____

Epi-linked: ☐ Yes ☐ No ☐ Unknown

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: ____ Country: ____

Healthcare provider information

Last name: ____

First name: ____

Provider type: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA

Facility name: ____

Address line 1: ____

Address line 2: ____

Zip code: ____ City: ____

State: ____ County: ____

Phone : ( )- - Type: ____

LABORATORY FINDINGS

Laboratory: ____ Specimen source: ____ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ____

Accession #: ____ Result date: / / Result type: ☐ Preliminary ☐ Final

Collection date: / / Test type: ☐ Acute ☐ IgM ☐ Convalescent ☐ IgG Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate

Date received: / / Organism: **Eastern Equine virus** Type:

Laboratory: ____ Specimen source: ____ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ____

Accession #: ____ Result date: / / Result type: ☐ Preliminary ☐ Final

Collection date: / / Test type: ☐ Acute ☐ IgM ☐ Convalescent ☐ IgG Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate

Date received: / / Organism: **Eastern Equine virus** Type:

Laboratory: ____ Specimen source: ____ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ____

Accession #: ____ Result date: / / Result type: ☐ Preliminary ☐ Final

Collection date: / / Test type: ☐ Acute ☐ IgM ☐ Convalescent ☐ IgG Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate

Date received: / / Organism: **Eastern Equine virus** Type:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / _____ Discharge date: / / _____ Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Physician diagnosis:
☐ Encephalitis
☐ Meningitis
☐ Meningoencephalitis
☐ Fever
☐ Asymptomatic
☐ Hepatitis/jaundice
☐ Multi-system organ failure
☐ Other _____
☐ Dengue hemorrhagic fever/ Dengue shock

Clinical classification:
☐ Neuroinvasive
☐ Non-neuroinvasive

Symptoms:
☐ Acute flaccid paralysis
☐ Altered mental state
☐ Anorexia
☐ Coma
☐ Confusion
☐ Cranial nerve palsies
☐ Diarrhea
☐ Double vision
☐ Eye pain
☐ Fatigue
☐ Fever
☐ Gait/balance difficulty
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Photophobia
☐ Rash
☐ Stiff neck
☐ Swollen lymph nodes
☐ Tremors
☐ Vertigo
☐ Vomiting
☐ Other symptoms: _____

Pre-existing Conditions

Before your West Nile virus (WNV) infection, did a health care provider ever tell he/she had any of the following medical conditions?

☐ Diabetes
☐ High blood pressure (hypertension)
☐ Heart attack (myocardial infarction)
☐ Angina or coronary artery disease
☐ Congestive heart failure
☐ Stroke
☐ Chronic obstructive pulmonary disease (COPD)
☐ Chronic liver disease
☐ Kidney disease or failure
☐ Bone marrow transplant
☐ Alcoholism
☐ Case had none of the conditions listed

Before WNV infection, did the case ever have a solid organ transplant? ☐ Yes ☐ No ☐ Unk

If yes, what organ was transplanted: _____

If yes, what year was the transplant: _____

Before WNV infection, has the case ever had cancer? ☐ Yes ☐ No ☐ Unk

If yes, what cancer type(s): _____

If yes, what year were you diagnosed: _____

If yes, are you currently being treated for cancer: ☐ Yes ☐ No ☐ Unk

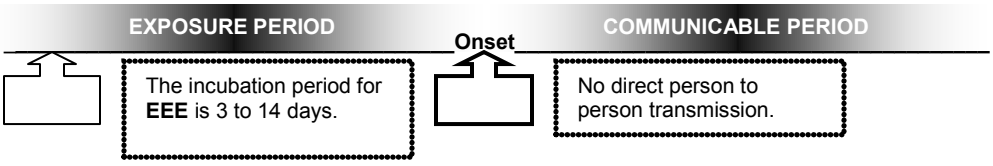
Before WNV infection, did the case have any medical condition that limited his/her ability to fight infection? ☐ Yes ☐ No ☐ Unk **If yes, what condition:** _____

At the time WNV infection was diagnosed, was the case taking any of the following types of prescription medications or treatments?

☐ Chemotherapy	☐ Oral or injected steroids	☐ Medications to treat coronary artery disease
☐ Other treatments for cancer	☐ Inhaled steroids	☐ Medications to treat congestive heart failure
☐ Hemodialysis	☐ Insulin or other medications to treat diabetes	☐ Medications that suppress the immune system
☐ Other treatments for kidney disease	☐ Medications to treat high blood pressure	☐ Case was not on any medication/treatments listed

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Ever vaccinated for Yellow Fever or Japanese encephalitis (JE)? ☐ Yes ☐ No ☐ Unknown

If yes, list MOST RECENT vaccination information ONLY:

Disease:	☐ Yellow fever ☐ JE	Disease:	☐ Yellow fever ☐ JE
Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:	
Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:	

Number of vaccinations: ____

Risk Factors/Travel Information

In the 15 days prior to onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Exposed to mosquitoes: ☐ Yes ☐ No ☐ Unk

Use a mosquito repellent: ☐ Yes ☐ No ☐ Unk If yes, how often? ☐ Sometimes ☐ Never ☐ Always ☐ Most of the time If yes, what type? ☐ Picaridin ☐ DEET ☐ Oil of lemon eucalyptus ☐ Other _____

If the patient is female, was she:

Pregnant? ☐ Yes ☐ No ☐ Unk

Breastfeeding? ☐ Yes ☐ No ☐ Unk

In the 30 days prior to onset of symptoms did the case:

Donate blood, blood products, organs or tissues? ☐ Yes ☐ No ☐ Unk Date donated: / / _____

Receive blood or blood products? ☐ Yes ☐ No ☐ Unk Date received: / / _____

Receive organs or tissue? ☐ Yes ☐ No ☐ Unk Date received: / / _____

Case acquired infection: ☐ Naturally ☐ Transplantation ☐ Transfusion ☐ Trans-placental ☐ Breastfeeding ☐ Occupationally ☐ Unknown

NOTES: _____

Lacrosse Encephalitis

Investigator:

Agency: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Suspect ☐ Probable ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:
Facility phone: ( )- - Type:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Parent with partner ☐ Separated ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Onset date: / / Diagnosis date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider type: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory:
Accession #:
Collection date: / /
Date received: / /
Specimen source:
Result date: / /
Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG
Organism: **Lacrosse virus**
Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other
Result type: ☐ Preliminary ☐ Final
Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate
Type:

Laboratory:
Accession #:
Collection date: / /
Date received: / /
Specimen source:
Result date: / /
Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG
Organism: **Lacrosse virus**
Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other
Result type: ☐ Preliminary ☐ Final
Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate
Type:

Laboratory:
Accession #:
Collection date: / /
Date received: / /
Specimen source:
Result date: / /
Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG
Organism: **Lacrosse virus**
Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other
Result type: ☐ Preliminary ☐ Final
Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate
Type:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / _____ Discharge date: / / _____ Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Physician diagnosis:
☐ Encephalitis
☐ Meningitis
☐ Meningoencephalitis
☐ Fever
☐ Asymptomatic
☐ Hepatitis/jaundice
☐ Multi-system organ failure
☐ Other _____
☐ Dengue hemorrhagic fever/ Dengue shock

Clinical classification:
☐ Neuroinvasive
☐ Non-neuroinvasive

Symptoms:
☐ Acute flaccid paralysis
☐ Altered mental state
☐ Anorexia
☐ Coma
☐ Confusion
☐ Cranial nerve palsies
☐ Diarrhea
☐ Double vision
☐ Eye pain
☐ Fatigue
☐ Fever
☐ Gait/balance difficulty
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Photophobia
☐ Rash
☐ Stiff neck
☐ Swollen lymph nodes
☐ Tremors
☐ Vertigo
☐ Vomiting
☐ Other symptoms: _____

Pre-existing Conditions

Before your West Nile virus (WNV) infection, did a health care provider ever tell he/she had any of the following medical conditions?

☐ Diabetes
☐ High blood pressure (hypertension)
☐ Heart attack (myocardial infarction)
☐ Angina or coronary artery disease
☐ Congestive heart failure
☐ Stroke
☐ Chronic obstructive pulmonary disease (COPD)
☐ Chronic liver disease
☐ Kidney disease or failure
☐ Bone marrow transplant
☐ Alcoholism
☐ Case had none of the conditions listed

Before WNV infection, did the case ever have a solid organ transplant? ☐ Yes ☐ No ☐ Unk

If yes, what organ was transplanted: _____

If yes, what year was the transplant: _____

Before WNV infection, has the case ever had cancer? ☐ Yes ☐ No ☐ Unk

If yes, what cancer type(s): _____

If yes, what year were you diagnosed: _____

If yes, are you currently being treated for cancer: ☐ Yes ☐ No ☐ Unk

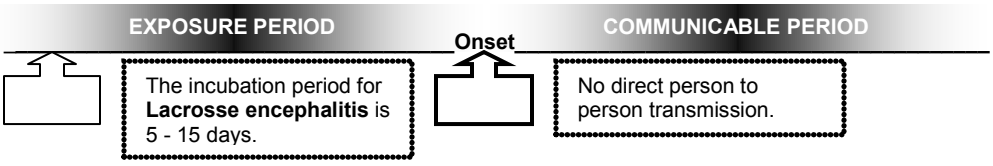
Before WNV infection, did the case have any medical condition that limited his/her ability to fight infection? ☐ Yes ☐ No ☐ Unk **If yes, what condition:** _____

At the time WNV infection was diagnosed, was the case taking any of the following types of prescription medications or treatments?

☐ Chemotherapy	☐ Oral or injected steroids	☐ Medications to treat coronary artery disease
☐ Other treatments for cancer	☐ Inhaled steroids	☐ Medications to treat congestive heart failure
☐ Hemodialysis	☐ Insulin or other medications to treat diabetes	☐ Medications that suppress the immune system
☐ Other treatments for kidney disease	☐ Medications to treat high blood pressure	☐ Case was not on any medication/treatments listed

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Ever vaccinated for Yellow Fever or Japanese encephalitis (JE)? ☐ Yes ☐ No ☐ Unknown

If yes, list MOST RECENT vaccination information ONLY:

Disease:	☐ Yellow fever ☐ JE	Disease:	☐ Yellow fever ☐ JE
Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:	
Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:	

Number of vaccinations: ____

Risk Factors/Travel Information

In the 15 days prior to onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Exposed to mosquitoes: ☐ Yes ☐ No ☐ Unk

Use a mosquito repellent: ☐ Yes ☐ No ☐ Unk If yes, how often? ☐ Sometimes ☐ Never ☐ Always ☐ Most of the time If yes, what type? ☐ Picaridin ☐ DEET ☐ Oil of lemon eucalyptus ☐ Other _____

If the patient is female, was she:

Pregnant? ☐ Yes ☐ No ☐ Unk

Breastfeeding? ☐ Yes ☐ No ☐ Unk

In the 30 days prior to onset of symptoms did the case:

Donate blood, blood products, organs or tissues? ☐ Yes ☐ No ☐ Unk Date donated: / /

Receive blood or blood products? ☐ Yes ☐ No ☐ Unk Date received: / /

Receive organs or tissue? ☐ Yes ☐ No ☐ Unk Date received: / /

Case acquired infection: ☐ Naturally ☐ Transplantation ☐ Transfusion ☐ Trans-placental ☐ Breastfeeding ☐ Occupationally ☐ Unknown

NOTES: _____

St. Louis Encephalitis (SLE)

Investigator: ____
Agency: ____ Phone number: ____

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ____
First and middle name: ____
Maiden name: ____ Suffix: ____
Address line: ____
Zip: ____ City: ____
State: ____ County: ____
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ____
Facility phone: ( )- - Type: ____

Date of Birth: / / Estimated? ☐ Age: ____
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Parent with partner ☐ Separated ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ____
Parent/Guardian phone: ( )- - Type: ____

EVENT

Onset date: / / Diagnosis date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ____
Exposure setting: ____
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ____ Country: ____

Healthcare provider information

Last name: ____
First name: ____
Provider type: ☐ ARNP ☐ DO ☐ MD ☐ NP ☐ PA
Facility name: ____
Address line 1: ____
Address line 2: ____
Zip code: ____ City: ____
State: ____ County: ____
Phone : ( )- - Type: ____

LABORATORY FINDINGS

Laboratory: ____
Accession #: ____
Collection date: / /
Date received: / /
Specimen source: ____
Result date: / /
Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG
Organism: **St. Louis virus**
Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ____
Result type: ☐ Preliminary ☐ Final
Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Type:

Laboratory: ____
Accession #: ____
Collection date: / /
Date received: / /
Specimen source: ____
Result date: / /
Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG
Organism: **St. Louis virus**
Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ____
Result type: ☐ Preliminary ☐ Final
Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Type:

Laboratory: ____
Accession #: ____
Collection date: / /
Date received: / /
Specimen source: ____
Result date: / /
Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG
Organism: **St. Louis virus**
Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ____
Result type: ☐ Preliminary ☐ Final
Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Type:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

ccupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / _____ Discharge date: / / _____ Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Physician diagnosis:
☐ Encephalitis
☐ Meningitis
☐ Meningoencephalitis
☐ Fever
☐ Asymptomatic
☐ Hepatitis/jaundice
☐ Multi-system organ failure
☐ Other _____
☐ Dengue hemorrhagic fever/ Dengue shock

Clinical classification:
☐ Neuroinvasive
☐ Non-neuroinvasive

Symptoms:
☐ Acute flaccid paralysis
☐ Altered mental state
☐ Anorexia
☐ Coma
☐ Confusion
☐ Cranial nerve palsies
☐ Diarrhea
☐ Double vision
☐ Eye pain
☐ Fatigue
☐ Fever
☐ Gait/balance difficulty
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Photophobia
☐ Rash
☐ Stiff neck
☐ Swollen lymph nodes
☐ Tremors
☐ Vertigo
☐ Vomiting
☐ Other symptoms: _____

Pre-existing Conditions

Before your West Nile virus (WNV) infection, did a health care provider ever tell he/she had any of the following medical conditions?

☐ Diabetes
☐ High blood pressure (hypertension)
☐ Heart attack (myocardial infarction)
☐ Angina or coronary artery disease
☐ Congestive heart failure
☐ Stroke
☐ Chronic obstructive pulmonary disease (COPD)
☐ Chronic liver disease
☐ Kidney disease or failure
☐ Bone marrow transplant
☐ Alcoholism
☐ Case had none of the conditions listed

Before WNV infection, did the case ever have a solid organ transplant? ☐ Yes ☐ No ☐ Unk

If yes, what organ was transplanted: _____

If yes, what year was the transplant: _____

Before WNV infection, has the case ever had cancer? ☐ Yes ☐ No ☐ Unk

If yes, what cancer type(s): _____

If yes, what year were you diagnosed: _____

If yes, are you currently being treated for cancer: ☐ Yes ☐ No ☐ Unk

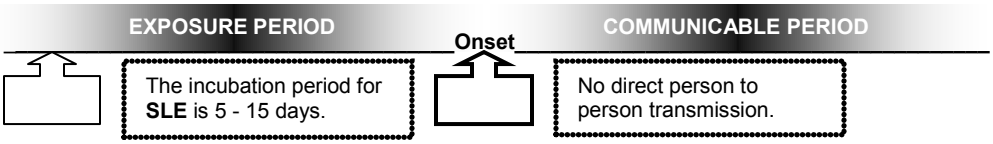
Before WNV infection, did the case have any medical condition that limited his/her ability to fight infection? ☐ Yes ☐ No ☐ Unk **If yes, what condition:** _____

At the time WNV infection was diagnosed, was the case taking any of the following types of prescription medications or treatments?

☐ Chemotherapy	☐ Oral or injected steroids	☐ Medications to treat coronary artery disease
☐ Other treatments for cancer	☐ Inhaled steroids	☐ Medications to treat congestive heart failure
☐ Hemodialysis	☐ Insulin or other medications to treat diabetes	☐ Medications that suppress the immune system
☐ Other treatments for kidney disease	☐ Medications to treat high blood pressure	☐ Case was not on any medication/treatments listed

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Ever vaccinated for Yellow Fever or Japanese encephalitis (JE)? ☐ Yes ☐ No ☐ Unknown

If yes, list MOST RECENT vaccination information ONLY:

Disease:	☐ Yellow fever ☐ JE	Disease:	☐ Yellow fever ☐ JE
Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:	
Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:	

Number of vaccinations: ____

Risk Factors/Travel Information

In the 15 days prior to onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Exposed to mosquitoes: ☐ Yes ☐ No ☐ Unk

Use a mosquito repellent: ☐ Yes ☐ No ☐ Unk If yes, how often? ☐ Sometimes ☐ Never ☐ Always ☐ Most of the time If yes, what type? ☐ Picaridin ☐ DEET ☐ Oil of lemon eucalyptus ☐ Other _____

If the patient is female, was she:

Pregnant? ☐ Yes ☐ No ☐ Unk

Breastfeeding? ☐ Yes ☐ No ☐ Unk

In the 30 days prior to onset of symptoms did the case:

Donate blood, blood products, organs or tissues? ☐ Yes ☐ No ☐ Unk Date donated: / / _____

Receive blood or blood products? ☐ Yes ☐ No ☐ Unk Date received: / / _____

Receive organs or tissue? ☐ Yes ☐ No ☐ Unk Date received: / / _____

Case acquired infection: ☐ Naturally ☐ Transplantation ☐ Transfusion ☐ Trans-placental ☐ Breastfeeding ☐ Occupationally ☐ Unknown

NOTES: _____

Venezuelan Equine Encephalitis (VEE)

Investigator: ______
Agency: ______ **Phone number:** ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Suspect ☐ Probable ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______ Date of Birth: __/__/__ Estimated? ☐ Age: ______
First and middle name: ______ Gender: ☐ Female ☐ Male ☐ Other ____
Maiden name: ______ Suffix: ______ Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: __/__/__
Address line: ______ Marital status: ☐ Single ☐ Married ☐ Parent with partner ☐ Separated ☐ Widowed
Zip: ______ City: ______ Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
State: ______ County: ______
Long-term care resident: ☐ Yes ☐ No ☐ Unknown Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Facility name: ______ Parent/Guardian name: ______
Facility phone: ( )- - Type: ______ Parent/Guardian phone: ( )- - Type: ______

EVENT

Onset date: __/__/__ Diagnosis date: __/__/__
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ______ Country: ______

Healthcare provider information

Last name: ______
First name: ______
Provider type: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - Type: ______

LABORATORY FINDINGS

Laboratory: ______ Specimen source: ______ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ______
Accession #: ______ Result date: __/__/__ Result type: ☐ Preliminary ☐ Final
Collection date: __/__/__ Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Date received: __/__/__ Organism: **Venezuelan Equine virus** Type:

Laboratory: ______ Specimen source: ______ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ______
Accession #: ______ Result date: __/__/__ Result type: ☐ Preliminary ☐ Final
Collection date: __/__/__ Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Date received: __/__/__ Organism: **Venezuelan Equine virus** Type:

Laboratory: ______ Specimen source: ______ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ______
Accession #: ______ Result date: __/__/__ Result type: ☐ Preliminary ☐ Final
Collection date: __/__/__ Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Date received: __/__/__ Organism: **Venezuelan Equine virus** Type:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Physician diagnosis:
☐ Encephalitis
☐ Meningitis
☐ Meningoencephalitis
☐ Fever
☐ Asymptomatic
☐ Hepatitis/jaundice
☐ Multi-system organ failure
☐ Other _____
☐ Dengue hemorrhagic fever/ Dengue shock

Clinical classification:
☐ Neuroinvasive
☐ Non-neuroinvasive

Symptoms:
☐ Acute flaccid paralysis
☐ Altered mental state
☐ Anorexia
☐ Coma
☐ Confusion
☐ Cranial nerve palsies
☐ Diarrhea
☐ Double vision
☐ Eye pain
☐ Fatigue
☐ Fever
☐ Gait/balance difficulty
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Photophobia
☐ Rash
☐ Stiff neck
☐ Swollen lymph nodes
☐ Tremors
☐ Vertigo
☐ Vomiting
☐ Other symptoms: _____

Pre-existing Conditions

Before your West Nile virus (WNV) infection, did a health care provider ever tell he/she had any of the following medical conditions?

☐ Diabetes
☐ High blood pressure (hypertension)
☐ Heart attack (myocardial infarction)
☐ Angina or coronary artery disease
☐ Congestive heart failure
☐ Stroke
☐ Chronic obstructive pulmonary disease (COPD)
☐ Chronic liver disease
☐ Kidney disease or failure
☐ Bone marrow transplant
☐ Alcoholism
☐ Case had none of the conditions listed

Before WNV infection, did the case ever have a solid organ transplant? ☐ Yes ☐ No ☐ Unk

If yes, what organ was transplanted: _____

If yes, what year was the transplant: _____

Before WNV infection, has the case ever had cancer? ☐ Yes ☐ No ☐ Unk

If yes, what cancer type(s): _____

If yes, what year were you diagnosed: _____

Deleted: Is the case employed, enrolled in school, or attending a child care facility? ☐ Yes ☐ No ☐ Unknown¶
(If yes, complete the following sections for each known occupation)¶

If yes, are you currently being treated for cancer: ☐ Yes ☐ No ☐ Unk

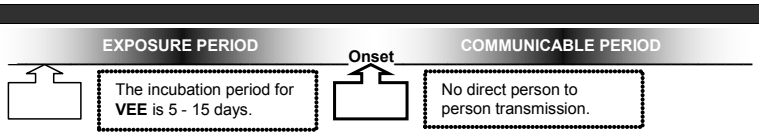
Before WNV infection, did the case have any medical condition that limited his/her ability to fight infection? ☐ Yes ☐ No ☐ Unk **If yes, what condition:** _____

At the time WNV infection was diagnosed, was the case taking any of the following types of prescription medications or treatments?

☐ Chemotherapy	☐ Oral or injected steroids	☐ Medications to treat coronary artery disease
☐ Other treatments for cancer	☐ Inhaled steroids	☐ Medications to treat congestive heart failure
☐ Hemodialysis	☐ Insulin or other medications to treat diabetes	☐ Medications that suppress the immune system
☐ Other treatments for kidney disease	☐ Medications to treat high blood pressure	☐ Case was not on any medication/treatments listed

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Ever vaccinated for Yellow Fever or Japanese encephalitis (JE)? ☐ Yes ☐ No ☐ Unknown

If yes, list MOST RECENT vaccination information ONLY:

Disease:	☐ Yellow fever ☐ JE	☐ Yellow fever ☐ JE
Date vaccinated:	/ /	/ /
Lot #:		
Vaccine type:		
Manufacturer:		

Number of vaccinations: ____

Risk Factors/Travel Information

In the 15 days prior to onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Exposed to mosquitoes: ☐ Yes ☐ No ☐ Unk

Use a mosquito repellent: ☐ Yes ☐ No ☐ Unk — If yes, how often? ☐ Sometimes ☐ Never ☐ Always ☐ Most of the time — If yes, what type? ☐ Picaridin ☐ DEET ☐ Oil of lemon eucalyptus ☐ Other _____

If the patient is female, was she:

Pregnant? ☐ Yes ☐ No ☐ Unk

Breastfeeding? ☐ Yes ☐ No ☐ Unk

In the 30 days prior to onset of symptoms did the case:

Donate blood, blood products, organs or tissues? ☐ Yes ☐ No ☐ Unk — Date donated: / / _____

Receive blood or blood products? ☐ Yes ☐ No ☐ Unk — Date received: / / _____

Receive organs or tissue? ☐ Yes ☐ No ☐ Unk — Date received: / / _____

Case acquired infection: ☐ Naturally ☐ Transplantation ☐ Transfusion ☐ Trans-placental ☐ Breastfeeding ☐ Occupationally ☐ Unknown

NOTES: _____

Western Equine Encephalitis (WEE)

Investigator: ______
Agency: ______ Phone number: ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Suspect ☐ Probable ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______ Date of Birth: __/__/__ Estimated? ☐ Age: ______
First and middle name: ______ Gender: ☐ Female ☐ Male ☐ Other ____
Maiden name: ______ Suffix: ______ Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: __/__/__
Address line: ______ Marital status: ☐ Single ☐ Married ☐ Parent with partner ☐ Separated ☐ Widowed
Zip: ______ City: ______ Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
State: ______ County: ______
Long-term care resident: ☐ Yes ☐ No ☐ Unknown Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Facility name: ______ Parent/Guardian name: ______
Facility phone: ( )- - Type: ______ Parent/Guardian phone: ( )- - Type: ______

EVENT

Onset date: __/__/__ Diagnosis date: __/__/__
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name: ______
First name: ______
Provider type: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: ______ Specimen source: ______ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ______
Accession #: ______ Result date: __/__/__ Result type: ☐ Preliminary ☐ Final
Collection date: __/__/__ Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Date received: __/__/__ Organism: **Western Equine virus** Type:

Laboratory: ______ Specimen source: ______ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ______
Accession #: ______ Result date: __/__/__ Result type: ☐ Preliminary ☐ Final
Collection date: __/__/__ Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Date received: __/__/__ Organism: **Western Equine virus** Type:

Laboratory: ______ Specimen source: ______ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other ______
Accession #: ______ Result date: __/__/__ Result type: ☐ Preliminary ☐ Final
Collection date: __/__/__ Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate
Date received: __/__/__ Organism: **Western Equine virus** Type:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / _____ Address: _____

Date worked to: / / _____ Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / _____ Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / _____ Discharge date: / / _____ Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Physician diagnosis:
☐ Encephalitis
☐ Meningitis
☐ Meningoencephalitis
☐ Fever
☐ Asymptomatic
☐ Hepatitis/jaundice
☐ Multi-system organ failure
☐ Other _____
☐ Dengue hemorrhagic fever/ Dengue shock

Clinical classification:
☐ Neuroinvasive
☐ Non-neuroinvasive

Symptoms:
☐ Acute flaccid paralysis
☐ Altered mental state
☐ Anorexia
☐ Coma
☐ Confusion
☐ Cranial nerve palsies
☐ Diarrhea
☐ Double vision
☐ Eye pain
☐ Fatigue
☐ Fever
☐ Gait/balance difficulty
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Photophobia
☐ Rash
☐ Stiff neck
☐ Swollen lymph nodes
☐ Tremors
☐ Vertigo
☐ Vomiting
☐ Other symptoms: _____

Pre-existing Conditions

Before your West Nile virus (WNV) infection, did a health care provider ever tell he/she had any of the following medical conditions?

☐ Diabetes
☐ High blood pressure (hypertension)
☐ Heart attack (myocardial infarction)
☐ Angina or coronary artery disease
☐ Congestive heart failure
☐ Stroke
☐ Chronic obstructive pulmonary disease (COPD)
☐ Chronic liver disease
☐ Kidney disease or failure
☐ Bone marrow transplant
☐ Alcoholism
☐ Case had none of the conditions listed

Before WNV infection, did the case ever have a solid organ transplant? ☐ Yes ☐ No ☐ Unk

If yes, what organ was transplanted: _____

If yes, what year was the transplant: _____

Before WNV infection, has the case ever had cancer? ☐ Yes ☐ No ☐ Unk

If yes, what cancer type(s): _____

If yes, what year were you diagnosed: _____

If yes, are you currently being treated for cancer: ☐ Yes ☐ No ☐ Unk

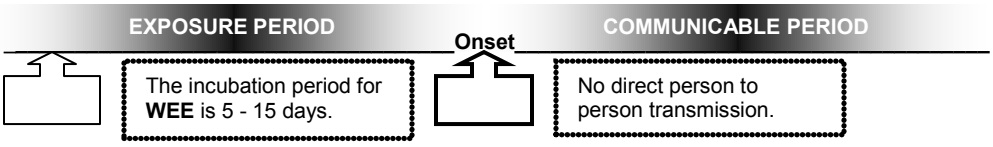
Before WNV infection, did the case have any medical condition that limited his/her ability to fight infection? ☐ Yes ☐ No ☐ Unk **If yes, what condition:** _____

At the time WNV infection was diagnosed, was the case taking any of the following types of prescription medications or treatments?

☐ Chemotherapy	☐ Oral or injected steroids	☐ Medications to treat coronary artery disease
☐ Other treatments for cancer	☐ Inhaled steroids	☐ Medications to treat congestive heart failure
☐ Hemodialysis	☐ Insulin or other medications to treat diabetes	☐ Medications that suppress the immune system
☐ Other treatments for kidney disease	☐ Medications to treat high blood pressure	☐ Case was not on any medication/treatments listed

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Ever vaccinated for Yellow Fever or Japanese encephalitis (JE)? ☐ Yes ☐ No ☐ Unknown

If yes, list MOST RECENT vaccination information ONLY:

Disease:	☐ Yellow fever ☐ JE	Disease:	☐ Yellow fever ☐ JE
Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:	
Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:	

Number of vaccinations: ____

Risk Factors/Travel Information

In the 15 days prior to onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Exposed to mosquitoes: ☐ Yes ☐ No ☐ Unk

Use a mosquito repellent: ☐ Yes ☐ No ☐ Unk — If yes, how often? ☐ Sometimes ☐ Never ☐ Always ☐ Most of the time — If yes, what type? ☐ Picaridin ☐ DEET ☐ Oil of lemon eucalyptus ☐ Other _____

If the patient is female, was she:

Pregnant? ☐ Yes ☐ No ☐ Unk

Breastfeeding? ☐ Yes ☐ No ☐ Unk

In the 30 days prior to onset of symptoms did the case:

Donate blood, blood products, organs or tissues? ☐ Yes ☐ No ☐ Unk — Date donated: / /

Receive blood or blood products? ☐ Yes ☐ No ☐ Unk — Date received: / /

Receive organs or tissue? ☐ Yes ☐ No ☐ Unk — Date received: / /

Case acquired infection: ☐ Naturally ☐ Transplantation ☐ Transfusion ☐ Trans-placental ☐ Breastfeeding ☐ Occupationally ☐ Unknown

NOTES: _____

E. coli -Pathogenic

Potential Bioterrorism Agent: Category B

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone, send isolate to SHL - (319) 335-4500
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

Six major categories of *Escherichia coli* strains cause diarrhea:

1) Enterohemorrhagic
2) Enterotoxigenic
3) Enteroinvasive
4) Enteropathogenic
5) Enteroaggregative
6) Diffuse-adherence

A. Agent

Escherichia coli includes over a hundred different serotypes belonging to the group of gram-negative bacteria. Most serotypes are harmless and live in the intestines of healthy humans and animals.

- Enterohemorrhagic (EHEC) *E. coli* include O157:H7, O26, O111, O103, O45, and O121. EHEC produce potent cytotoxins called Shiga toxin 1 and 2.
- Enterotoxigenic (ETEC) category includes *E. coli* O6,08,O15, O020, O25, O27, O49, O63, O78, O128ac, O148, O153, O159, 167, and O169. This category of *E. coli* is a major cause of travelers' diarrhea in people from industrialized countries who visit developing countries.
- Enteroinvasive (EIEC) category includes O28ac, O29, O112, O124, O0136, O143, O144, O152, O164, and O167. The inflammatory disease of the gut mucosa and submucosa caused by EIEC strains of *E. coli* closely resembles that produced by *Shigella*.
- Enteropathogenic (EPEC) category includes O55:NM, O55:H6, O55:H7, O86:NM, O86:H34, O111:NM, O111:H2, O111:H12, O111:H21, O114:NM, O127:H6, O127:H9, O127:H21, O128:H2, O128:H7, O128:H12, O142:H6, and O157:H45. Diarrheal disease in this category almost always occurs in children aged less than one year.
- Enteroaggregative (EAEC) category includes O3:H2 and O44:H18. This category of diarrhea-producing *E. coli* is increasingly recognized as a cause of both acute and persistent diarrhea among children and adults. However, there is some debate about whether all strains of EAEC cause diarrhea.
- Diffuse-adherence (DAEC) category. DAEC is the least well-defined category of diarrhea-causing *E. coli*. Little is known at present about the reservoir, modes of transmission, host risk factors, or period of communicability of DAEC.

All pathogenic *E. coli* should be approached by public health in a similar manner.

B. Clinical Description

Infection with pathogenic *E. coli* may present with a wide spectrum of clinical manifestations. An individual may be asymptomatic, have mild non-bloody diarrhea, or have grossly bloody diarrhea. Most diagnosed cases develop bloody diarrhea 6 to 48 hours after the onset of non-bloody diarrhea. Abdominal cramps, nausea and vomiting may also be

present. Fever is usually absent. In severe cases, the patient may progress to develop other clinical syndromes such as hemolytic uremic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP). Hemolytic uremic syndrome (HUS) is characterized by the acute onset of microangiopathic hemolytic anemia, renal injury, and low platelet count. Thrombotic thrombocytopenic purpura (TTP) is characterized by anemia and low platelet counts but can include central nervous system (CNS) involvement and fever.

C. Reservoirs

- EHEC: Cattle appear to be a reservoir of significant public health importance; however, other animals, such as deer, are also known to carry EHEC. In addition, humans serve as a reservoir.
- ETEC: Humans; although also occurs in animals people are the reservoir for strains causing diarrhea in humans.
- EIEC and EPEC: humans

D. Modes of Transmission

- EHEC and ETEC transmission occurs fecal-orally via contaminated food, drinking water or recreational water. Transmission may also occur directly from person-to-person; and can include certain types of sexual contact. The infectious dose for *E. coli* O157:H7 is very low (about 100 organisms). *E. coli* O157:H7 has been associated with the consumption of undercooked contaminated ground beef, unpasteurized apple juice and cider, unpasteurized milk and other dairy products, raw fruits and vegetables, and salami.
- EIEC: Scant available evidence suggests that it is transmitted by contaminated food.
- EPEC transmission has occurred through contaminated infant formula and weaning foods. In infant nurseries, transmission by fomites and contaminated hands can occur. Outbreaks due to contaminated rice and water have been reported.

E. Incubation Period

- EHEC: The incubation ranges from 2 - 10 days with a median of 3 - 4 days.
- ETEC: The incubation ranges from 10 to 72 hours.
- EIEC: The incubation period of 10 to 18 hours have been observed
- EPEC: Incubations periods as short as 9 to 12 hours have been observed in adults studies

F. Period of Communicability or Infectious Period

- EHEC: One week or less in adults but up to 3 weeks in about one-third of infected children. Prolonged carriage is uncommon.
- ETEC and EPEC: for duration of excretion of the pathogen, which may be prolonged.
- EIEC: for the duration of the pathogen excretion.

G. Epidemiology

- EHEC was first identified in 1982 in an outbreak in the United States. Since then, infections have been recognized as an important cause of bloody diarrhea in North America, Europe, Japan, Australia and southern South America. As with other enteric illnesses, the young and old are usually more severely ill when infected. Infection in young children may lead to complications such as HUS in about 5 to 10% of cases. Sporadic cases of *E. coli* O157:H7 infections occur throughout the year with a peak in the incidence of disease during the summer months. Outbreaks in the United States have been associated with undercooked ground beef, unpasteurized milk and apple cider, and other food products. Most cases are due to inadequately cooked ground beef.
- ETEC: This category of *E. coli is* a major cause of travelers' diarrhea in people from industrialized countries who visit developing countries. ETEC is also a major cause of dehydrating diarrhea in infants and children in developing countries, especially among children less than 2 years of age. It has been estimated that globally ETEC causes as many as 380,000 deaths annually in children under five.
- EIEC infections are endemic in developing countries and cause about 1%-5% of diarrheal episodes among people visiting treatment centers. Rarely, infection and outbreaks of EIEC diarrhea have been reported in industrialized countries.
- EPEC: The oldest recognized category of diarrhea-producing *E. coli*, implicated in outbreaks in the 1940's and 1950's. Diarrheal disease in this category is virtually confined to children aged less than one year. It is rarely

seen in North America and Europe but remains a major agent of infant diarrhea in many developing area, including South America sub-Saharan Africa, and Asia.

- EAEC: This category of diarrhea-producing *E. coli* is increasingly recognized as a cause of both acute and persistent diarrhea among children and adults. EAEC associated with infant diarrhea have been reported from Latin America, Asia, and sub-Saharan Africa and may be responsible for a proportion of diarrheal disease in developed countries. EAEC associated diarrhea has also been associated with HIV-infected adults and international travelers to developing countries.
-

H. Bioterrorism Potential

Category B Agent: *E. coli* has been identified as a potential category B bioterrorism agent as a food safety threat.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (e.g., a diapered child, child care attendee or food handler) and if so, to prevent further transmission.
- To identify sources of public health concern (e.g., a contaminated food source or recreational water) and to stop transmission from such a source.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) tests stool specimens for the presence of pathogenic *E. coli* and will confirm and serotype isolates obtained from clinical specimens at other laboratories. Additionally, all laboratories in Iowa are required to submit pathogenic *E.coli* isolates for typing to aid in the public health surveillance necessary to prevent transmission of this disease. For more information on submitting specimens call SHL at (319) 335-4500 or visit www.shl.uiowa.edu/.

SHL will test implicated food items from a cluster or outbreak of disease. Food is submitted through local public health departments.

C. Local Public Health Agency (LPHA) Reporting and Follow-Up Responsibilities

Case Investigation

All cases of *E. coli* causing illness require public health follow-up, excluding urinary tract infections caused by normal bowel flora *E. coli*.

a. It is the LPHA responsibility to complete an E. coli Pathogenic disease investigation by interviewing the case and others who may be able to provide pertinent information.

b. Use the following guidelines to assist you in completing the investigation:
   1) Record the demographic information, date of symptom onset, symptoms, and medical information.

2) When asking about exposure history (food, travel, activities, etc.), use the incubation range for *E. coli* of (10 hrs –10 days). Specifically, focus on the period beginning a minimum of 10 hours prior to the case's onset date back to no more than 10 days before onset. If the person ate ground meat, ask how well the meat was cooked.
3) If possible, record any restaurants at which the case ate, including food item(s) and date consumed. If it is suspected that the case became infected through food, refer to the Iowa's Foodborne Illness Outbreak Investigation Manual.
4) Ask questions about water supply because pathogenic *E. coli* may be acquired through water consumption.
5) Household/close contact, pet or other animal contact, child care, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts. Determine whether the case attends or works at a child care facility and/or is a food handler.
6) If several attempts have been made to obtain case information, but have been unsuccessful (e.g., the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), enter into IDSS as much information as has been gathered. Please explain in the notes section in IDSS the reason why the investigation could not be completed. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

After completing the interview enter the information into IDSS. If IDSS is not available, fax [(515), 281-5698] the investigation form or mail to:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

c. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in 4) Controlling Further Spread.

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

In the healthcare setting patients should be placed in contact isolation for the duration of the diarrhea.

In homes, persons with diarrhea should not cook food for others and must use good handwashing technique after using the toilet.

Cases must be instructed on proper handwashing, especially after-toilet use.

B. Managing Special Situations

Foodhandlers

Contacts with diarrhea who are food handlers shall be considered a case and handled in the same fashion.

Food handlers with pathogenic *E. coli* must be excluded from work. A food handler is any person directly preparing or handling food. This can include a patient-care or child-care provider.

No foodservice worker, healthcare or child care provider should be at work while experiencing active diarrhea.

After diarrhea has resolved, food-handling employees may only return to food handling after producing two consecutive negative stool tests taken at least 24 hours apart. If a case has been treated with an antimicrobial, the stool specimens shall not be submitted until at least 48 hours after cessation of therapy. Food handling employees may be reassigned to tasks where they do not handle food once they have had no diarrhea for 24 hours while awaiting the two negative stool tests.

Households:

Enteric diseases spread easily through households because both close, personal contact and foodborne modes of transmission can be involved. The case interview should provide valuable information about the household that can give clues to the most likely source of the illness. This will also help identify possible vehicles for transmission to other family/household members.

Person-to-person transmission of enteric disease among household members (or household-like contacts) occurs very readily. The potential for transmission is greater if any of the following risk factors are present in the household:

- Diapered children, especially toddlers.
- Crowded, unsanitary conditions.
- Lack of adequate handwashing facilities.
- A fecally incontinent adult who is cared for by other household members.
- Any activity in which contact with feces is likely.
- Situations where enteric diseases can be sexually transmitted (e.g. homosexual males)

The steps in assessment of the household are:

1. Try to determine whether the source of the illness was in the household (either via person-to-person transmission or a common source, such as food).
2. Teach about foodborne and person-to-person transmission patterns, which can occur within the household. Provide fact sheets.
3. If other household members are ill, determine if they are at high risk for transmission outside the household (child care, food establishment, patient care). (See guidelines for specific high-risk setting.)
4. Make recommendations for exclusion from work and/or cohorting/exclusion from child care if indicated. (See guidelines for specific high-risk setting.)
5. Report case(s) to CADE; IDSS is the preferred method for this.
6. If household contacts are in high-risk settings, and are having symptoms, they should be excluded from the high-risk situation and a stool test done. If the household contacts are in high risk settings, but have no symptoms, instruct them on good hygiene, and warn if symptoms develop they should exclude themselves immediately from the high risk situation and have a stool test done.

Child Care

The role that child care centers play in the transmission of enteric diseases has been well documented. Because young children lack hygiene skills, are not always fecally continent (in diapers), and are highly mobile, they serve as very efficient "spreaders" of enteric organisms. Child care employees may also contribute to the spread of enteric diseases if they care for other children or prepare food without properly washing their hands after changing diapers. However, food and water are rarely vehicles for transmission in child care centers. Enteric diseases are commonly spread from person to person as a result of the combination of poor hygiene and highly infectious enteric pathogens. Since *E. coli* may be transmitted person-to-person through fecal-oral transmission, it is important to follow up on cases of pathogenic *E. coli* in a child care setting carefully. General recommendations include:

- Children with pathogenic *E. coli* should be excluded until two consecutive negative stool tests taken more than 24 hours apart are obtained. If a case has been treated with an antimicrobial, the stool specimens shall not be submitted until at least 48 hours after cessation of therapy.
- Staff with diarrhea due to pathogenic *E.coli* should not return to food handling work or direct child or care until they have had 2 consecutive negative stool cultures taken 24 hours or more apart but not sooner than 48 hours following the discontinuation of antibiotics.
- Staff of child care programs are considered food handlers. No one should be at work with active diarrhea.

School

Since *E. coli* may be transmitted person-to-person through fecal-oral transmission, it is important to follow up on cases of pathogenic *E. coli* in a school setting carefully. General recommendations include:

- Students or staff with *E. coli* infection who have diarrhea should be excluded until their diarrhea is gone.
- Students or staff with *E. coli* who do not have diarrhea or vomiting and do not handle food may remain in school if proper hygienic practices are maintained.
- Students or staff who handle food and have *E. coli* infection (symptomatic or not) should not prepare food until their diarrhea is gone and they have had two negative stool tests (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given).

Patient Care Settings

Reports of enteric disease in patient-care settings should be followed up as soon as possible, since outbreaks among the ill and elderly may cause significant morbidity and mortality. When a case of shiga-toxin producing *E. coli* occurs in a patient-care setting, the local public health agency (LPHA) may be called upon to assess the potential for transmission and to recommend interventions to prevent further transmission to patients/residents or other staff members.

A. Assessment of Potential for Transmission by a Health-care Worker (HCW)

1. Obtain and review a description of the HCW duties.
2. Determine the presence of acute diarrhea.

B. Prevention of Transmission

1. If the HCW does have contact with the patient, the patient's environment or food and has diarrhea, exclude from work until diarrhea is resolved and two successive stool cultures collected at least 24 hours apart and at least 48 hours after discontinuation of antibiotics are negative. Once they have had no diarrhea for 24 hours they can be assigned to duties not involving contact with patient, patient environment or food while awaiting negative stool testing.
2. If the person with a shiga-toxin producing *E. coli* disease is a patient or resident in a hospital, nursing home or other residential care facility, Contact Precautions should be followed until the patient is free of diarrhea. Standard Precautions should be used at all times.

C. Contact Precautions

1. Gowns and gloves should be worn when handling the patient's feces or fecally soiled items such as the patient's bed linens, towels, washcloths and clothing. In addition, wear gowns when entering the room if it is anticipated that clothing will have substantial contact with environmental surfaces, items in the environment, or if the patient is incontinent.
2. If rinsing is necessary, fecally soiled clothing and linens should be rinsed only in a commode or hopper sink designed for this purpose. Never rinse in a handwashing sink!
3. The patient's soiled clothing and linens should be bagged in bags that do not leak through for transport to the laundry.
4. If at all possible, use disposable diapers for incontinent patients.
5. Articles used to care for the patient should be used only for that patient until diarrhea is resolved. This would include blood pressure cuff, stethoscope, thermometer, etc.
6. As always, hands should be washed thoroughly after caring for each patient. Patient hands should also be washed.

Community Residential Programs

Actions taken in response to a case of pathogenic *E. coli* in a community residential program will depend on the type of program and the level of functioning of the residents.

In long-term care facilities, residents with pathogenic *E. coli* should be placed on Contact Precautions until their symptoms subside.

Staff members who give direct patient care that includes oral contact (e.g., feed patients, give mouth or denture care, or give medications) are considered food handlers and are subject to food handler restrictions, meaning they should not return to those duties until they have 2 consecutive negative stool cultures taken 24 hours or more apart but not sooner than 48 hours following the discontinuation of antibiotics. Once they have had no diarrhea for 24 hours they can be assigned to duties other than patient care or food handling. In addition, staff members with *E. coli* infection who are not food handlers should not work until their diarrhea is gone.

In residential facilities for the developmentally disabled, staff and clients with *E. coli* should refrain from handling or preparing food for other residents until their diarrhea has subsided and 2 consecutive negative stool cultures taken 24 hours or more apart but not sooner than 48 hours following the discontinuation of antibiotics are reported as negative. In addition, staff members with *E. coli* infection who are not food handlers should not work until their diarrhea is gone.

Household Contacts Employed In High Risk Occupations

Household contacts should be questioned about their employment in high-risk occupations such as food handling, direct patient care, or child care establishments. All household contacts should be educated about the symptoms of the disease and about hygienic methods to avoid further transmission. Proper hand hygiene should be stressed. If they have symptoms, a stool test should be done.

Household contacts that are symptomatic and employed as food handlers, child care workers, or persons responsible for direct patient care should be excluded from their duties until their diarrhea ceases. Household contacts with pathogenic *E. coli* should not return to food handling or direct child or patient care until they have had 2 consecutive negative stool cultures taken 24 hours or more apart but not sooner than 48 hours following the discontinuation of antibiotics. Once they have had no diarrhea for 24 hours they can be assigned to duties other than patient care or food handling. They should all be educated on good hygiene, not to work if they become ill, and if diarrhea develops they should be tested and the guidelines above followed regarding returning to work.

No one should be at work with active diarrhea.

Reported Incidence Is Higher than Usual/Outbreak Suspected

Consult with the epidemiologist on-call at CADE, (800) 362-2736. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several county lines and therefore may be difficult to identify at a local level.

If the number of reported cases in any city or county is higher than usual, or if an outbreak is suspected, investigate clustered cases in an area or institution to determine the source of infection and mode of transmission. A common vehicle (such as water, food or association with a child care center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces.

Note: Refer to Iowa's Foodborne Illness Outbreak Investigation Manual for comprehensive information on investigating foodborne illness complaints and outbreak.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with the CADE. CADE can help coordinate pickup and testing of food samples. If a commercial product is suspected, CADE will coordinate follow-up with relevant outside agencies. If waterborne spread is suspected, contact the county environmental health office and IDPH Division of Environmental Health at (515) 281-7726.

- Environment, such as countertops and bathrooms should be cleaned with an EPA approved disinfectant.
- Follow recommended procedures for fecal coliform testing of recreational water supplies (e.g., pools, lakes).

The general practice of the SHL is to only test food samples implicated in suspected outbreaks, not single cases. The LPHA may suggest that the holders of food implicated in single case incidents locate a private laboratory, which will test food or store the food in their refrigerator for a period of time in case additional reports are received. *Note:* Refer to the Iowa's Foodborne Illness Outbreak Investigation Manual for comprehensive information in investigating foodborne illness complaints and outbreak.

Preventive Measures/Education

To avoid exposure, advise individuals:

- To always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet and after changing diapers. (After changing diapers, wash the child's hands also.)
- In all settings, especially child care, dispose of feces in a sanitary manner.
- When caring for someone with diarrhea, the care giver should wash their hands with plenty of soap and water after helping the person use the toilet, changing diapers, cleaning the bathroom, soiled clothes or soiled sheets. The patient's hands should be washed also.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of *E. coli* to a case's sexual partners as well as being a way to prevent the exposure to and transmission of other pathogens.
- If diagnosed with pathogenic *E. coli* , seek medical attention if symptoms compatible with hemolytic uremic syndrome (HUS) occur. (See chapter on HUS.)
- Keep food that will be eaten raw, such as fruits and vegetables, from becoming contaminated by animal-derived food products. (Wash thoroughly, especially those that will not be cooked.)
- If served an undercooked hamburger or other ground beef product in a restaurant, send it back for further cooking.
- Cook all ground meats thoroughly.
- Drink only pasteurized milk, juice, or cider.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for pathogenic *E. coli* can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

REFERENCES

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, Academy of Pediatrics, 2003.

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CDC Website. *Escherichia coli* O157:H7. www.cdc.gov/ecoli/index.html

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Iowa Administrative Code (641) Chapter 1 Notification & Surveillance of Reportable Communicable & Infectious Diseases, Poisonings & Conditions.

Resources

Centers for Disease Control and Prevention: www.cdc.gov/

Iowa Department of Public Health: www.idph.state.ia.us/

- Center for Acute Disease Epidemiology
- Bureau Of Environmental Health

Iowa Department of Inspections and Appeals, Food Inspections: www.state.ia.us/government/dia/index.html

Iowa Department of Natural Resources: www.iowadnr.com/

University of Iowa State Hygienic Laboratory: www.shl.uiowa.edu/

FACT SHEET Pathogenic *Escherichia coli*

What is pathogenic *E. coli*?
Pathogenic *E. coli* are a type of bacteria that can cause bloody diarrhea. It is usually seen in the summer. The term "O157:H7" means a certain type of *E. coli*. Most types of *E. coli* are harmless and live in the gut but some *E. coli* including O157:H7 can cause you to be sick.

How is *E. coli* spread?
E. coli is spread by a person eating or drinking food or water that contains stool of infected people or animals. Raw milk, unpasteurized cider or other juices, or poorly cooked meat, especially ground beef, or can also contain the bacteria.

Who gets pathogenic *E. coli*?
Anyone can be infected.

What are the symptoms of pathogenic *E. coli*?
The major symptom is diarrhea, which can look like bloody water. Stomach cramps and chills may occur. There is usually no fever. Rarely, the infection can cause the kidneys to stop working, especially in young children.

How soon do symptoms appear?
Symptoms usually start in 3 - 4 days after exposure but can be anywhere from 10 hours - 10 days.

What Should You Do If You Think You May Be Infected?
Contact your doctor. Do not go to work or school and do not prepare food when diarrhea is present.

Can infection with *E. coli* occur more than once?
Yes

How is infection with *E. coli* prevented?
- Do not fix food for others while having diarrhea.
- Always wash hands thoroughly with soap and water before eating and before and after fixing any food, especially raw meat.
- Wash hands after using the toilet and after changing diapers. (Wash the diapered child's hands also.)
- When caring for someone with diarrhea, wash your hands with plenty of soap and water after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes or soiled sheets. Be sure to wash their hands also.
- Always refrigerate meat. Never leave raw meat at room temperature.
- Keep food that will be eaten raw, such as fruits and vegetables, from being in contact with food products from animals. (Wash thoroughly, especially those that will not be cooked.)
- Never eat raw meat. If you are served an undercooked hamburger or other ground beef product in a restaurant, send it back for further cooking.
- Cook all ground beef and hamburger thoroughly – to a temperature of 155 degrees F for at least 15 - 16 seconds or until juices run clear and no pink is visible.
- Always wash hands, cutting boards and utensils between fixing raw meat or poultry and other items such as fruits and vegetables.
- Drink only pasteurized milk, juice, or cider.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection (condoms) should be used to prevent the spread of pathogenic *E. coli* to sexual partners as well as other pathogens.

E. Coli O157:H7 and other Shiga-Toxin producing strains

Agency: _____

Investigator: _____ Phone number: _____

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: _____
First and middle name: _____
Maiden name: _____ Suffix: _____
Address line: _____
Zip: _____ City: _____
State: _____ County: _____
Phone: ( )- - Type: _____
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: _____

Date of Birth: / / Estimated? ☐ Age: _____
Gender: ☐ Female ☐ Male ☐ Other _____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: _____
Parent/Guardian phone: ( )- - Type: _____

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of Death / /
Event exception ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: _____
Exposure setting: _____
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom: _____
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: _____ Country: _____

Healthcare provider information

Last name: _____
First name: _____
Provider title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name: _____
Address line 1: _____
Address line 2: _____
Zip code: _____ City: _____
State: _____ County: _____
Phone : ( )- - Type: _____

LABORATORY FINDINGS

Laboratory: _____ Accession #: _____ Collection date: / /
Date received: / / Specimen source: _____ Test type: _____
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***E. coli*** Serotype:

Laboratory: _____ Accession #: _____ Collection date: / /
Date received: / / Specimen source: _____ Test type: _____
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***E. coli*** Serotype:

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Test type: _____

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***E. coli*** Serotype:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admission date: / / Discharge date: / /

Days hospitalized: _____

Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

HUS Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

TTP Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

If HUS or TTP diagnosis create new HUS event for this case

Symptoms

Diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Nausea ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Vomiting ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Headache ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Muscle weakness ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Visible bloody diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Fever ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Highest known fever: _____ ☐ °F ☐ °C

Abdominal cramps ☐ Yes ☐ No ☐ Unk _____ Days/Hours

Chills ☐ Yes ☐ No ☐ Unk _____ Days/Hours

First symptom: Most severe symptom: Date returned to normal activities: / /

OTHER LAB FINDINGS

Clinical specimen from case

Was PFGE performed: ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

Environmental specimen testing

Food, Medication, or environmental samples tested? ☐ Yes ☐ No ☐ Unk Describe samples: (circle positives)

For what were the samples tested? ☐ E. coli or EHEC ☐ Salmonella ☐ Shigella ☐ Other testing (specify):

Laboratory: Positive? ☐ Yes ☐ No ☐ Unk PFGE performed? ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

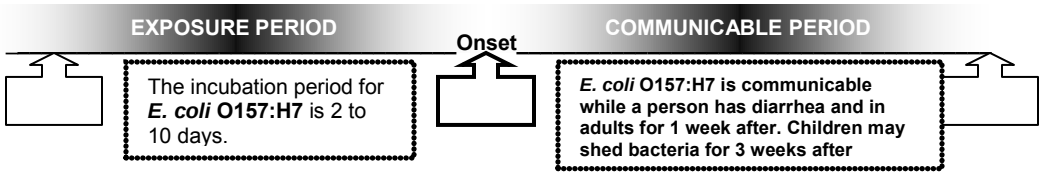
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of days:	# of days:	# of days:
# of times a day:	# of times a day:	# of times a day:
Route:	Route:	Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risk Factors/Travel Information – *In the 10 days prior to onset of symptoms did the case:*

Travel

Travel within Iowa? ☐ Yes ☐ No ☐ Unk City in Iowa: Departure date: / / Return date: / /

Travel within U.S.? ☐ Yes ☐ No ☐ Unk State: City: Departure date: / / Return date: / /

Travel outside U.S.? ☐ Yes ☐ No ☐ Unk Country: Departure date: / / Return date: / /

Visit restaurants? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below: *County and address are missing from this table*

Establishment name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attend Group Gatherings (e.g. weddings, parties)? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Where did the case purchase groceries in the 2 weeks before the onset of symptoms:

Store name	Address	City/State/Zip	County	Date purchased
				/ /
				/ /
				/ /

Dietary Information – *In the 10 days prior to onset of symptoms did the case consume the following:*

Meat and poultry

Any of these meat products? ☐ Poultry ☐ Ground beef ☐ Pork ☐ Meat other than ground meat (salami, jerky, wild game)

Where was grilling done? ☐ At own home ☐ Another person's home ☐ Picnic ☐ Vendor stand ☐ Other; Please list:_____

From dates consumed: / / , / / To dates consumed: / / , / /

Was the meat fully cooked? ☐ Yes ☐ No ☐ Unknown

List all source/types: _____

List all brand names: _____

From dates consumed: / / , / / To dates consumed: / / , / /

Other meat and poultry products

Deli/lunch meat ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw/partially cooked eggs or in foods (e.g. cookie dough)**:** ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized products

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized juice: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other unpasteurized products: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other products

Health supplements: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Infant formula: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Baby food: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Fruits and vegetables

Raw fruits: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw vegetables: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other

Leftover foods consumed: ☐ Yes ☐ No ☐ Unk Reheated: ☐ Yes ☐ No ☐ Unk From date consumed: / / To date consumed: / /

Describe leftovers consumed:

Animal Exposures – *In the 10 days prior to the onset of symptoms did the case:*

Check all that apply

Visit or live on a farm: ☐ Yes ☐ No ☐ Unknown
Exposed to manure: ☐ Yes ☐ No ☐ Unknown
Have farm animal contact: ☐ Yes ☐ No ☐ Unknown Animals:

Have reptile contact: ☐ Yes ☐ No ☐ Unknown ☐ Iguana ☐ Lizard ☐ Turtle ☐ Snake ☐ Other _____
Reptile lived with case: ☐ Yes ☐ No ☐ Unknown

Have other animal contact in home: ☐ Yes ☐ No ☐ Unknown Animal: Animal sick: ☐ Yes ☐ No ☐ Unk

Visit a petting zoo: ☐ Yes ☐ No ☐ Unknown Touched animals: ☐ Yes ☐ No ☐ Unk Animal:

Zoo name: Address/Zip/County:

Water Exposures – *In the 10 days prior to the onset of symptoms did the case*

Go swimming? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below:

Water Type	Location Type	Dates visited	Facility name / Street address & Zip
☐ Hot tub/spa ☐ Pond ☐ Kiddie pool ☐ Water park ☐ River/stream ☐ Swimming pool ☐ Lake ☐ Water fountain/ splash pad ☐ Other_____	☐ Hotel/motel ☐ Indoor private ☐ Indoor public ☐ Outdoor private ☐ Outdoor public	From / / To / /	

Drinking water supply

Home:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**School:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well
Work:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**Child care:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well

Other Exposures – *In the 10 days prior to the onset of symptoms did the case:*

Wear diapers ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unk

Have contact with immunocompromised person: ☐ Yes ☐ No ☐ Unk Setting: ☐ Home ☐ Work ☐ Other _____

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

CONTACTS

Number of people living in case's household: _____

Are there close contacts of the case with same symptoms: ☐ Yes ☐ No ☐ Unknown

Close contacts of the case with the same symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

Diseases G-H-I

GIARDIASIS

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physicians: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Only clusters of cases warrant specific follow-up

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Giardia lamblia is a protozoan parasite that has two forms: cyst (inactive form) and trophozoite (active form). Infected persons can shed both trophozoites and cysts in stool

B. Clinical Description

Symptoms: of giardiasis are variable, and usually asymptomatic, but can include soft, non-bloody, foul-smelling diarrhea. Abdominal cramps and a "bloated" feeling with excess gas often accompany the diarrhea. The diarrhea can be chronic or intermittent and it can be accompanied by fatigue and steatorrhea (fatty stools). Appetite loss combined with malabsorption can lead to significant weight loss, failure to thrive and anemia.

Onset: is usually abrupt. Diarrhea may occur after meals, is non-bloody and is mucous-like 25% of the time.

Complications: are not common. However diarrhea may last 2 - 6 weeks.

C. Reservoirs

Common reservoirs: Humans and some animals (dogs, cats, rodents, cattle, deer, elk, beaver, and muskrats) are reservoirs, although the public health importance of most nonhuman reservoirs is debated. Overall, humans are the most important source of other human infections. Wildlife such as deer, elk, and beaver may be important in contaminating surface water supplies; domestic animals (*e.g.,* dogs) may be a source for some human exposures. The most common source in Iowa is young children, especially those in child care.

D. Modes of Transmission

Spread: *Giardia* is principally spread person-to-person. Persons become infected by fecal-oral transfer of cysts from the feces of an infected individual, especially in institutions and child care centers. Transmission can also occur person-to-person through certain types of sexual contact (*e.g.,* oral-anal contact. Giardiasis has developed with ingestion with as few as 10 cysts.

Environmental: Localized outbreaks may occur from fecally contaminated water, such as stream and lake waters and swimming pools that are contaminated by human and animal feces. Eating food contaminated by an infected food handler can be a source, but this has been rarely documented. Diapered children using "kiddie" pools filled with tap water without added chlorine or bleach is a high-risk source of transmission.

E. Incubation period

The incubation period can vary from 3 - 25 days (or longer); the median is 7–10 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes the organism, which may be many months. The asymptomatic carrier rate is high.

G. Epidemiology

Giardiasis has a worldwide distribution. Children are infected more frequently than adults. Prevalence is higher in areas of poor sanitation and in institutions with children who are not toilet trained, especially child care centers. It infects nearly 2% of adults and 6% to 8% of children in developed countries worldwide. Nearly 33% of people in developing countries have had giardiasis. In the United States, *Giardia* infection is the most common intestinal parasitic disease affecting humans. Surveys conducted in the United States have demonstrated prevalence rates of *Giardia* in stool specimens that range from 1% to 30%, depending on location and age. Cases occur more commonly in the summer and fall months**.**

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To assess the magnitude of the disease in different areas and among different risk groups.
- To identify outbreaks as soon as possible.
- To design implement effective control or prevention methods.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides testing services for ova and parasites including *Giardia* from stool specimens. For additional information, contact the SHL at (319) 335-4500 or visit www.shl.uiowa.edu/.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a. Case investigation of giardiasis in Iowa residents may be necessary in certain settings where outbreaks are likely to occur (child cares, nursing homes, etc). Follow-up of individual cases is usually not warranted.
b. Following IDPH notification of an outbreak or cluster of cases, LPHA(s) may be asked to assist in an official investigation. An investigation can be completed by interviewing the case and others who may be able to provide pertinent information. Most of the information required can be obtained from the healthcare provider or the medical record. Use the following guidelines to assist in completing the investigation:
    1) Record "giardiasis" as the disease being reported.
    2) Record the case's demographic information.
    3) Record the date of symptom onset, symptoms, date of diagnosis, and hospitalization information (if applicable).
    4) When asking about exposure history (food, travel, activities, etc.), use the incubation period range for giardiasis (3–25 days). Specifically, focus on the period beginning a minimum of 3 days prior to the case's onset date back to no more than 25 days before onset.
    5) Ask questions about travel history, contact with children, and outdoor activities to help identify where the case became infected.
    6) Ask questions about water supply because giardiasis may be acquired through water consumption.
    7) Household/close contact, pet or other animal contact, child care, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts. Determine whether the case attends or works at a child care facility and/or is a food handler.
c. Discuss the findings with IDPH or mail (in an envelope marked "Confidential") to IDPH, Center for Acute Disease Epidemiology. The mailing address is:
    IDPH, CADE
    Lucas State Office Building, 5th Floor
    321 E. 12th Street
    Des Moines, IA 50319-0075

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Food handlers with giardiasis must be excluded from work until diarrhea has ceased.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Child care

Since giardiasis may be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of giardiasis in child care settings.

- Children with giardiasis who have diarrhea should be excluded until their diarrhea is gone.
- Children with giardiasis who have no diarrhea and are otherwise not ill may be excluded or can remain in the program if special precautions are taken.

- Since most staff in child-care programs are considered food handlers, those with *Giardia* in their stools who are symptomatic should not be at work until diarrhea has ceased. When returning to work good hand hygiene should be practiced at all times.

- All child care staff and children should practice good hand hygiene at all times.

School

Since giardiasis may be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of giardiasis in a school setting. General recommendations include:

- Students or staff with giardiasis who have diarrhea should be excluded until their diarrhea is gone.

- Students or staff with giardiasis, who do not handle food, have no diarrhea and are not otherwise sick, may remain in school if special precautions are taken. Students and staff must practice frequent and thorough handwashing using warm running water, soap, with friction for at least 15 seconds, and thoroughly drying their hands with paper towels or a blow dryer. If symptoms of giardiasis occur the person should be excluded.

Food Handler

Note: A food handler is any person directly preparing or handling food. This can include a patient care or child-care provider. See glossary for a more complete definition.

Since *Giardia* may be transmitted via food, it is important to follow up on outbreaks of *Giardia* in any setting carefully. General recommendations include:

- Food handlers with *Giardia* infection who have diarrhea should be excluded until their diarrhea is gone, (until 24 hours after last bout of diarrhea or until formed stools are occurring).
- Food handlers must practice frequent and thorough handwashing using warm running water and soap, with friction for at least 15 seconds, and thoroughly dry their hands with paper towels or a blow dryer.

Community Residential Programs

Actions taken in response to a case of giardiasis in a community residential program will depend on the type of program and the level of functioning of the residents. In long-term care facilities, residents with giardiasis should be placed on standard (including enteric) precautions until their symptoms subside. Staff members who give direct patient care (*e.g.,* feed patients, give mouth or denture care or give medications) are considered food handlers and are subject to food handler restrictions. In residential facilities for the developmentally disabled, staff and clients with giardiasis must refrain from handling or preparing food for other residents until their diarrhea has subsided.

Reported Incidence Is Higher than Usual or an Outbreak is Suspected

If the number of reported cases of giardiasis in your city or county is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle (such as water, food or association with a child care center) should be sought and applicable preventive or control measures should be instituted (*e.g.,* removing an implicated food item from the environment). Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with CADE at (800)-362-2736. CADE can help to determine a course of action to prevent further cases and can perform surveillance for cases in an outbreak that may cross several county lines and therefore be difficult to identify at a local level.

D. Preventive Measures

Environmental Measures

To avoid exposure, recommend that individuals:

- Always wash their hands thoroughly with soap, water, and friction for at least 15 seconds before eating or preparing food, after using the toilet and after changing diapers.
- In child cares, dispose of feces in a sanitary manner.
- When caring for someone with diarrhea, scrub hands with plenty of soap and water after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes, or soiled sheets.
- When hiking or camping, be aware of the risks of drinking water from streams or lakes. Bringing water to a full, rolling boil is sufficient to kill *Giardia*. Several filters are also available that remove *Giardia* cysts. Additionally, some chemical water treatments are effective against *Giardia.*
- Avoid sexual practices that may involve direct contact with feces. Latex barrier protection should be emphasized as a way to prevent the spread of *Giardia* to case's sexual partners as well as being a way to prevent the exposure to and transmission of other pathogens.

International Travel

Travelers to developing countries should:

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than uncarbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water. Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel their own raw fruits or vegetables and do not eat the peelings.
- Avoid foods and beverages from street vendors.

Note: For more information regarding international travel, contact the CDC's Traveler's Health Office at (877) 394-8747 or visit: www.cdc.gov/travel.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Giardiasis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.
CDC Website. Giardiasis www.cdc.gov/parasites/giardia/epi.html
Heymann, D. L. ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.
State Hygienic Laboratory, www.shl.uiowa.edu/

FACT SHEET *GIARDIA* Infection; Giardiasis

What is giardiasis (also called *Giardia* infection)?
Giardiasis is a gut infection caused by a germ called *Giardia lamblia*. It is a common cause of diarrhea in the US. Over three hundred cases of giardiasis are reported each year in Iowa.

What are the symptoms of giardiasis?
People with *Giardia* infection may experience mild or severe diarrhea, stomach cramps, bloating and fatigue. Diarrhea may last several weeks or months and might cause weight loss. Fever is rare. However, some people infected with *Giardia* do not become ill. Many young children have no symptoms. (Children in child care centers are often infected, but do not need treatment unless they get diarrhea).

How soon do symptoms appear?
Diarrhea usually begins 7 - 10 days, but it can range from 3 - 25 days after infection with *Giardia*.

How is *Giardia* infection spread?
Giardia germs are passed in the feces of an infected person or animal and may contaminate water or food. The disease can spread from person to person in child care centers or other settings where people sometimes don't wash their hands well enough. People who go camping or hunting can get giardiasis by drinking untreated water.

Who gets *Giardia* infection?
Anyone can become infected with *Giardia*, but children are infected more often than adults. It occurs frequently in hospitals, prisons, or child cares. Persons who travel overseas or who drink untreated water also have a higher risk of giardiasis.

For how long is a person infectious?
An infected person can spread *Giardia* for a few weeks to months. Treatment may shorten this length of time.

What is the treatment for this illness?
Antibiotics are often prescribed by doctors to treat *Giardia* infection. However, some persons may recover on their own without treatment. Not everyone infected with *Giardia* needs to be treated.

Do infected people need to be excluded from school, work, or child care?
Since *Giardia* germs are found in the feces (stool), people with diarrhea should not go to school or work. However, they may return when the diarrhea stops. Everyone should wash his or her hands each time after using the toilet.

What can be done to help prevent the spread of *Giardia*?
1. Carefully wash hands thoroughly after using the toilet or handling dirty diapers.
2. Properly dispose of sewage so water sources will not be infected.
3. Do not drink water that has not been properly treated. When camping, treat your drinking water by boiling or by using "purification tablets" before drinking.

GONORRHEA

Also known as: Gonorrhea, Gonococcal Infection (GC), *Neisseria gonorrhoeae* (NG), Clap, Drip, Dose

Responsibilities:
Hospital: Report cases by IDSS, fax, phone, or mail
Lab: Report positive lab results by IDSS, fax, phone, or mail
Physician: Report cases by fax, phone, or mail
Local Public Health Agency (LPHA): Follow-up conducted by Iowa Department of Public Health or by Black Hawk, Linn, Polk or Scott County Health Departments

Iowa Department of Public Health
Sexually Transmitted Disease Reporting Hotline: (515) 281-3031

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Gonorrhea is a common sexually transmitted disease (STD) caused by *Neisseria gonorrhoeae*, a bacterium that can grow and multiply easily in the warm, moist environment of the reproductive tract, including the cervix, uterus, and fallopian tubes in women, and in the urethra in women and men. The bacterium can also grow in the oropharynx, anorectum, and eyes.

B. Clinical Description

Symptoms: Men may have some signs or symptoms that appear 2 – 5 days after infection, but the symptoms can take as long as 30 days to appear. There may also be no signs or symptoms as this infection is often asymptomatic. Signs and symptoms may include a burning sensation when urinating, or a white, yellow, or green discharge from the penis, but these are often mild. Sometimes men with gonorrhea have painful or swollen testicles.

In women, symptoms are often mild. Many who are infected have no symptoms. Even when a woman has symptoms, they can be non-specific and mistaken for a bladder or vaginal infection. Initial signs and symptoms in women can include a painful or burning sensation when urinating, increased vaginal discharge, or vaginal bleeding between periods or during or after intercourse. Women with mild or no symptoms are still at risk of developing serious complications.

Symptoms of rectal infection in both men and women may include discharge, anal itching, soreness, bleeding, or sometimes painful bowel movements. Rectal infection can sometimes have no symptoms. Infections in the throat may cause a sore throat, but usually there are no symptoms.

Onset: If symptoms are present, a range of 0 - 30 days, with 2 - 7 days being the most common. Often there are no symptoms; 10% - 15% of men and about 80% of women have no symptoms. People with no symptoms are at increased risk for developing complications, because they receive no treatment. Asymptomatic individuals may spread the infection unknowingly.

Complications: Untreated gonorrhea can cause serious and permanent health problems in both women and men.

- In men, gonorrhea can cause epididymitis, a painful condition of the testicles that can lead to infertility if untreated. Without prompt treatment, gonorrhea can also affect the prostate, and lead to scarring inside the urethra, making urination difficult.

- In women, gonorrhea is a common cause of pelvic inflammatory disease (PID). About one million women in the United States develop PID each year. Women with PID do not necessarily have symptoms. When symptoms are present, they can be very severe and can include abdominal pain and fever. PID can lead to internal abscesses (pus-filled "pockets" that are hard to cure) and long lasting, chronic pelvic pain. PID can cause infertility, or damage the fallopian tubes enough to increase the risk of ectopic pregnancy. Ectopic pregnancy is a life-threatening condition in which a fertilized egg grows outside the uterus, usually in a fallopian tube.
- If a pregnant woman has gonorrhea, she may give the infection to her baby as the baby passes through the birth canal during delivery. This can cause blindness, joint infection, or a life-threatening blood infection in the baby. Treatment of gonorrhea as soon as it is detected in pregnant women will reduce the risk of these complications. Pregnant women should consult a healthcare provider for appropriate examination, testing, and treatment, if necessary.
- Gonorrhea can spread to the blood or joints. This condition, called Disseminated Gonococcal Infection, can be life threatening. People with gonorrhea can more easily contract HIV, the virus that causes AIDS. HIV-infected people with gonorrhea are more likely to transmit HIV to someone else.

C. Reservoirs

Common reservoirs: Humans

D. Modes of Transmission

Person-to-person: Gonorrhea is spread through contact between the penis, vagina, mouth, and anus. Ejaculation does not have to occur for gonorrhea to be transmitted or acquired. Gonorrhea can also be spread from mother to baby during birth.

Gonorrhea can spread to other unlikely parts of the body. For example, a person can get an eye infection after touching infected genitals and then the eyes. People who have had gonorrhea and received treatment may get infected again if they have sexual contact with a person infected with gonorrhea.

Any sexually active person can be infected with gonorrhea. The greater the number of sex partners, the greater the risk of infection. Because the cervixes of teenage girls and young women are not fully matured, they are at particularly high risk for infection if sexually active. Since gonorrhea can be transmitted by oral or anal sex, men who have sex with men are also at risk for gonorrheal infection.

E. Incubation period

The average incubation period is 2 - 5 days, but may range from 0 - 30 days. ***Men*** who are infected may have no symptoms, and may not believe that they are infected. Most ***women*** who are infected have no symptoms. Most women who develop local symptoms do so within 10 days of infection.

F. Period of Communicability or Infectious Period

A person who is infected with gonorrhea can spread disease from the time he or she is infected until properly treated. Reinfection is common if partners are not adequately treated in a timely manner.

G. Epidemiology

Gonorrhea is the second most commonly reported notifiable disease in the United States. It is estimated that approximately 800,000 people in the United States are infected with gonorrhea each year. Only about ½ of these infections are reported to CDC. In 2011, 321,849 cases of gonorrhea were reported in the U.S. to CDC. In 2011, the rate of reported gonorrhea infections was 104.2 per 100,000 persons. In Iowa, there were 1,966 cases reported in 2011 (Rate: 65 per 100,000). Rates are highest among persons 15 to 29 years of age. People in this age range account for 81% of

diagnoses. In addition, rates among African Americans remain markedly higher than among other racial and ethnic groups.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To monitor trends in gonorrhea diagnoses and prevalence so that prevention and treatment funds may be targeted efficiently, and prevention programs may be evaluated.
- To monitor perinatal exposures to gonorrhea and morbidity in infants born with gonorrhea.
- To monitor trends in antimicrobial resistant gonorrhea to ensure appropriate treatment has been provided to the infected individual.
- To interrupt disease transmission chains by providing risk reduction counseling and partner notification and referral services to persons recently diagnosed with gonorrhea.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139A) stipulates that the laboratory and healthcare provider must report. The Sexually Transmitted Disease reporting number for IDPH is (515) 281-3031.

Healthcare providers must complete an "Iowa Confidential Report of Sexually Transmitted Disease" morbidity form within 3 days of a positive *N. gonorrhoeae* diagnosis. Healthcare providers should provide the name, date of birth, sex, pregnancy status (for women), race/ethnicity, home address, phone number, and treatment information for each reported case. In addition, Iowa Code 139A allows for reporting of partner names, addresses, and treatment information for health department follow up.

Morbidity forms and postage-paid envelopes are available for order from the clearinghouse at http://healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=303
They are also available by phoning the STD Program.

Fax completed forms to the STD Program at: (515) 281-0466

Alternatively, they may be mailed to the address below:

Iowa Department of Public Health
Bureau of HIV, STD, and Hepatitis (00)
321 East 12th Street, 5th Floor
Des Moines, IA 50319-0075

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation:
Risk reduction counseling and partner notification/referral services will be provided by Disease Prevention Specialists employed by the Iowa Department of Public Health, or by Black Hawk, Linn, Polk or Scott County Health Departments.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

The Iowa Department of Public Health may initiate a voluntary partner notification/referral service with persons who have been diagnosed with *N. gonorrhoeae* infection. Healthcare providers can

facilitate this process by describing the program to the patient and encouraging the patient to meet with the Department's Disease Prevention Specialist assigned to his or her region.

Patient's names and times of exposure are not used when notifying partners. Referral for testing and treatment are offered to all partners. Appropriate referrals for other services are provided.

Physicians may assist the Disease Prevention Specialist with collecting partner information for notification. In such cases, the healthcare provider should collect the following information: Partner name, address, home phone number, age and/or date of birth, race, sex, partner's marital status, height, size/build, general physical description, dates of first and last exposure, and any other information that may help in locating and counseling the partner, such as medical conditions, place of employment, cell phone number, or other unusual circumstances/situations. Providers should also report any partner treatment.

Patient-delivered partner therapy/ Expedited Partner Therapy: When a patient has partners who may not be willing or who may be unable to submit to testing, patient-delivered partner therapy is an option. A physician, physician assistant, or advanced registered nurse practitioner who diagnoses a sexually transmitted chlamydial or gonococcal infection may prescribe, dispense, furnish, or otherwise provide prescription oral antibiotic drugs to that patient's sexual partner or partners without examination of the partner(s) (see Iowa Code 139A.41). If the infected individual patient is unwilling or unable to deliver such prescription drugs to a sexual partner or partners, a physician, physician assistant, or advanced registered nurse practitioner may dispense, furnish, or otherwise provide the prescription drugs to the department or local disease prevention investigation staff for delivery to the partner or partners. Medications or prescriptions should be provided for all partners who have been sexually exposed to the patient within the two months prior to diagnosis or within the two months prior to the onset of symptoms, whichever is greater. However, expedited partner therapy should not be used if the partner is a pregnant woman or if the patient is a man who has sex with other men (MSM). Further information on expedited partner therapy can be found at: www.idph.state.ia.us/IDPHChannelsService/file.ashx?file=CDA25C68-F6DA-4471-8C1C-016C2CA44C81

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Report unusual cases to the Iowa Department of Public Health at (515) 281-3031, including antimicrobial resistant cases.

D. Preventive Measures

Preventive Measures/Education

Risk reduction counseling/education and testing should be offered to all persons with risk factors for *N. gonorrhoeae* infections and transmission.

The surest way to avoid transmission of sexually transmitted diseases is to abstain from sexual contact, or to be in a long-term mutually monogamous relationship with a partner who has been tested and is known to be uninfected.

Latex male condoms for vaginal, oral or anal sex, when used consistently and correctly, can reduce the risk of transmission of *N. gonorrhoeae*.

N. gonorrhoeae screening is recommended for all sexually active women 25 years of age and younger. All pregnant women should have a screening test for *N. gonorrhoeae*. Women older than 25 years whose sexual practices put them at risk for *N. gonorrhoeae* infection should be tested at least once a year. It has been shown that screening and treatment of women with *N. gonorrhoeae* infection of the cervix reduces the likelihood of PID.

The Centers for Disease Control and Prevention's 2010 STD Treatment Guidelines provide specific recommendations for STD prevention services that should be available to all sexually active men who have sex with men (MSM). The first recommendation for this population is that STD screening be performed at least annually.

Any genital symptoms such as discharge or burning during urination or unusual sore or rash should be a sign to stop having sex and consult a healthcare provider immediately. In cases of rectal or anal infection, symptoms may include anal or rectal itching, discharge and pain during defecation. Symptoms for *N. gonorrhoeae* of the mouth or throat include soreness and redness. If *N. gonorrhoeae* infects the eye, men and women might experience conjunctivitis (redness, itching and discharge from the eye). If a person has been treated for *N. gonorrhoeae* (or any other STD), he or she should notify all recent sex partners so they can see a healthcare provider and be treated. This will reduce the risk that the sex partners will develop serious complications from *N. gonorrhoeae* and the person's risk of becoming re-infected. The person and all sex partners must avoid sex until they have completed treatment for *N. gonorrhoeae*.

An infected patient should be tested for other sexually transmitted diseases.

See www.hivtest.org/STDTesting.aspx for a current list of sites that can provide STD testing.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Gonorrhea can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Treatment Information

N. gonorrhoeae can be treated and cured with antibiotics. For uncomplicated gonococcal infections of the cervix, urethra, and rectum: 250 mg ceftriaxone, delivered in a single dose by intramuscular injection **plus** 1 gram of azithromycin, given orally in a single dose. Pregnant women should be treated with the same regimen. HIV-positive persons with *N. gonorrhoeae* should also receive the same treatment as those who are HIV-negative. Refer to the 2010 CDC Sexually Transmitted Diseases Treatment Guidelines for complete treatment guidelines.

Treatment failure has occurred among individuals with gonococcal infections who were treated with oral cephalosporins. Although antimicrobial resistant strains of *N. gonorrhoeae* are most common in Asian countries, treatment failures with oral cephalosporins have been documented in North America. Decreasing susceptibility to cephalosporins has been observed throughout the United States, occurring more frequently on the West Coast. People diagnosed with *N. gonorrhoeae* should tell their healthcare provider if they or their sex partners have recently traveled to areas in which resistance appears to be developing more rapidly (e.g., Southeast Asia), to ensure proper treatment.

References

Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines 2010. MMWR 2010; 59, RR-12 www.cdc.gov/std/treatment/2010/default.htm

Update to CDC's *Sexually Transmitted Diseases Treatment Guidelines, 2010*: Oral Cephalosporins No Longer a Recommended Treatment for Gonococcal Infections – MMWR August 10, 2012

CDC. Sexually Transmitted Disease Statistics, 2011. www.cdc.gov/std/stats/default.htm

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.
CDC. Case Definitions for Infectious Conditions under Public Health Surveillance, 1996: www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm

Notification And Surveillance of Reportable Communicable and Infectious Diseases, Poisonings and Conditions. Iowa Code 2010 Section 139A.

Additional Resources

CDC Website with most current guidelines for prevention, surveillance, and treatment: www.cdc.gov/std/Gonorrhea/default.htm

STD Program web site, Iowa Department of Public Health. www.idph.state.ia.us/HivStdHep/STD.aspx?prog=Std&pg=StdHome

American Sexual Health Association. www.ashasexualhealth.org/std-sti/gonorrhea.html

FACT SHEET GONORRHEA

What is gonorrhea?
Gonorrhea is a sexually transmitted disease (STD) caused by a bacterium that can grow and multiply easily in the warm, moist areas of the reproductive tract, including the cervix (opening to the womb), uterus (womb), and fallopian tubes (egg canals) in women, and in the urethra (urine canal) in women and men. The germ can also grow in the mouth, throat, eyes, and anus (butt).

How do people get gonorrhea?
Gonorrhea is spread through contact between the penis, vagina, mouth, and anus. A man does not have to ejaculate to give gonorrhea to a sexual partner. Gonorrhea can also be transmitted to a baby during birth if the mother is infected.

Gonorrhea infection can spread to other parts of the body. For example, a person can get an eye infection after touching infected genitals (private areas) and then the eyes. People who have been treated for gonorrhea may get it again if they have sexual contact with another person or untreated partner who has gonorrhea.

Who is at risk for gonorrhea?
Any sexually active person can be infected with gonorrhea. In the United States, the highest reported rates of infection are among sexually active teenagers, young adults, and African Americans.

What are the signs and symptoms of gonorrhea?
Some men have signs or symptoms that appear 2 - 5 days after infection, but the symptoms can take as long as 30 days to appear or may not appear at all. Signs and symptoms include a burning sensation when urinating (peeing), or a white, yellow, or green discharge from the penis. Sometimes men with gonorrhea get painful or swollen testicles.

In women, the signs and symptoms of gonorrhea are often mild, and many women who are infected have no symptoms. Even when a woman has signs, they can be so mild they may be mistaken for a bladder or vaginal infection. The first signs and symptoms for women include a painful or burning sensation when urinating (peeing), increased vaginal discharge, or vaginal bleeding between menstrual periods. Women with mild or no symptoms are still at risk of developing serious complications.

Symptoms of rectal infection in both men and women may include discharge, anal itching, soreness, bleeding, or sometimes painful bowel movements. Rectal infection may also cause no symptoms. Infections in the throat may cause a sore throat or hoarseness, but usually causes no symptoms.

What are the complications of gonorrhea?
Untreated gonorrhea can cause serious and permanent health problems in both women and men.

In women, gonorrhea is a common cause of pelvic inflammatory disease (PID). About 1 million women in the United States develop PID each year. Women with PID do not necessarily have symptoms right away. When symptoms are present, they can be very severe and can include abdominal pain and fever. PID can lead to internal abscesses (pus-filled “pockets” that are hard to cure) and long lasting, chronic pelvic (lower belly) pain. PID can cause infertility, or damage the fallopian tubes enough to increase the risk of ectopic pregnancy. Ectopic pregnancy is a life-threatening condition in which a fetus grows outside the uterus, usually in a fallopian tube.

In men, gonorrhea can cause epididymitis, a painful condition of the testicles that can lead to infertility if left untreated. Without prompt treatment, gonorrhea can also affect the prostate, and lead to scarring inside the urethra, making urination difficult.

Gonorrhea can spread to the blood or joints. This condition can be life threatening. People with gonorrhea can more easily contract HIV, the virus that causes AIDS. HIV-infected people with gonorrhea are more likely to transmit HIV to someone else.

How does gonorrhea affect a pregnant woman and her baby?
If a pregnant woman has gonorrhea, she may give the infection to her baby as the baby passes through the birth canal during delivery. This can cause blindness, joint infection, or a life-threatening blood infection in the baby. Treatment of gonorrhea as soon as it is detected in pregnant women will reduce the risk of these complications. Pregnant women should consult a healthcare provider for appropriate prenatal care, testing, and treatment, if necessary.

How is gonorrhea diagnosed?
Several laboratory tests are available to diagnose gonorrhea. Your doctor will choose the one appropriate for you.

What is the treatment for gonorrhea?
Several antibiotics can successfully cure gonorrhea in adolescents and adults, but drug-resistant strains of gonorrhea are increasing in many areas of the world, including the United States, and successful treatment of gonorrhea is becoming more difficult. Because many people with gonorrhea also have chlamydia, another sexually transmitted disease (STD), antibiotics for both infections are usually given together. Persons with gonorrhea should be tested for other STDs.

It is important to take all of the medication prescribed to cure gonorrhea, even if the signs or symptoms stop before all the medication is gone. Although medication will stop the infection, it will not repair any permanent damage done by the disease. People who have had gonorrhea and have been treated can get the disease again. If you continue to have symptoms even after you are treated, you should return to your doctor to be re-tested.

How can gonorrhea be prevented?
The surest way to avoid spreading sexually transmitted diseases is to abstain from sexual intercourse, or to be in a long-term mutually faithful relationship with a partner who has been tested and you know is uninfected.
Latex condoms, when used consistently and correctly, can reduce the risk of getting gonorrhea.
Any genital symptoms such as discharge or burning during urination or unusual sore or rash should be a signal to stop having sex and see a doctor immediately. If a person has been treated for gonorrhea (or any other STD), he/she should notify all recent sex partners so they can see a healthcare provider and be treated. This will reduce the risk of sex partners developing serious complications, and the person's risk of becoming re-infected. The person and all sex partners must avoid sex until they have completed treatment.

Report Immediately by phone

Haemophilus influenzae type b (Invasive)

Also known as: Hib disease, *H. flu*, spinal meningitis, *Haemophilus*

Responsibilities:
Hospital: Report immediately by phone, follow up required
Infection Preventionist: Report immediately by phone, follow up required
Lab Report / Isolate submission requirements: Isolates from invasive sites, should be submitted to State Hygienic Laboratory (SHL), for serotyping.
Lab: Report positive isolates immediately by phone
Physician: Report immediately by phone
Local Public Health Agency (LPHA): Report immediately by phone, follow up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Haemophilus influenzae disease is caused by small gram-negative coccobacilli that may be either encapsulated (types a–f) or unencapsulated (nontypeable). Type b (Hib) is the only kind for which there is a vaccine and for which control measures are considered necessary. It is the only type that is reportable.

B. Clinical Description

Symptoms: Invasive disease may produce various clinical syndromes, including meningitis, bacteremia or sepsis, epiglottitis, pneumonia, septic arthritis, osteomyelitis, pericarditis, empyema, and abscesses. In contrast, mucosal infections such as bronchitis, sinusitis, and otitis, which can be caused by Hib, are considered noninvasive disease

Onset: Onset will depend on the site of infection. With meningitis sudden onset of high fever, vomiting, lethargy, and meningeal irritation consisting of bulging fontanelle in infants or stiff neck in older children can occur.

C. Reservoir

Humans are the only known host.

D. Modes of Transmission

Haemophilus influenzae type b is transmitted person-to-person by droplet or direct contact with nasopharyngeal secretions of an infected person. The most common portal of entry is the nasopharynx. Newborns can become infected by inhaling amniotic fluid or genital tract secretions containing the organism.

E. Incubation Period

The incubation period is unknown but probably short, 2 – 4 days.

F. Period of Communicability or Infectious Period

- **If not on antibiotic therapy**—as long as organisms are present in the upper respiratory tract, which may be for a prolonged period even without symptoms.
- **If on antibiotic therapy**—noncommunicable within 24–48 hours after starting effective antibiotic therapy.

The contagious potential of invasive Hib disease is considered to be limited. However, certain circumstances, particularly close contact with a case (*e.g.,* in a household, child care center, or institutional setting), can lead to outbreaks of Hib or direct secondary transmission of the disease. Asymptomatic carriage is known to occur.

G. Epidemiology

Hib occurs worldwide. Invasive Hib is most prevalent among children 2 months to 3 years old and is unusual in healthy individuals over the age of 5 years (though can occur in adults with chronic conditions such as chronic obstructive pulmonary disease). In the United States, peak incidence is in children 6 – 12 months of age. Secondary cases may occur in households, child care centers, and other institutional settings.

Before the widespread use of Hib conjugate vaccines, *Haemophilus influenzae* type b (Hib) was a leading cause of bacterial meningitis in the United States among children less than 5 years old and a major cause of other life-threatening invasive bacterial diseases in this age group. Meningitis occurred in approximately two-thirds of children with invasive Hib disease, resulting in hearing impairment or severe permanent neurologic sequelae (mental retardation, seizure disorder, cognitive and developmental delays,) and paralysis in 15–30% of survivors. Approximately 5% of all cases were fatal. Invasive Hib disease now occurs in unvaccinated or under vaccinated children and adults. Type f is the most common other serotype causing invasive infections in the U.S. Iowa had approximately 64 cases of Hib per year prior to the vaccine. In the last 10 years Iowa has averaged 0.7 cases per year in persons less than 5 years of age.

Invasive disease has been more frequent in boys, African Americans, Alaskan Eskimos, Apache and Navajo Indians, child-care center attendees, children living in overcrowded conditions, and children who were not breastfed. Unimmunized children, particularly those younger than 4 years old, in prolonged close contact (such as in a household setting) with a child with invasive Hib disease, are at increased risk for invasive Hib disease. Other factors predisposing to invasive disease include sickle cell disease, asplenia, HIV infection, certain immunodeficiency syndromes, and malignant neoplasms.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To ensure that all cases of invasive *Haemophilus influenza* are typed and to identify all cases of Hib.
- To identify household and child care contacts of Hib cases that need antimicrobial prophylaxis and/or immunization and to prevent further spread of the disease for Hib cases.
- To distinguish between failure to vaccinate and vaccine failure.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider immediately report any suspected or confirmed case. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736, if calling after business hours, call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff. *Note:* Due to the potential severity and spread of invasive *Haemophilus influenzae*, IDPH requests that information about any case be **immediately reported** to the local public health agency where diagnosed. If this is not possible, call IDPH Center for Acute Disease Epidemiology (CADE) at (800) 362-2736.

What to Report to the Iowa Department of Public Health (IDPH)

- A case clinically compatible with invasive Hib (*e.g.,* with meningitis, bacteremia, epiglotittis, or pneumonia), as diagnosed by a healthcare professional, or
- Isolation (culture) of Hib from a normally sterile body site (blood, cerebrospinal fluid (CSF), or less commonly joint, pleural, or pericardial fluid), or
- Detection of Hib antigen in CSF.

Laboratory Testing Services Available

Confirmation and serotyping of *Haemophilus influenzae* isolates are available at the University of Iowa State Hygienic Laboratory (SHL). All strains of *Haemophilus influenzae* isolated from normally sterile sites must be serotyped in order to identify the strain and to differentiate between serotype B and other serotypes, for which no control measures are necessary. Subcultures should be sent with a requisition form to SHL. Call (319) 335-4500 for shipping directions.

Note: Positive antigen results from urine and/or serum samples are not reliable for diagnosis of Hib disease and should not be used as a substitute for culture results, but can help in determining immediate control measures while awaiting laboratory results.

C. Local Public Health Agency Follow-Up Responsibilities

If a case of Hib is identified, IDPH Center for Acute Disease Epidemiology (CADE) will become involved in the investigation and disease control recommendations, in collaboration with the local public health agencies. The infection preventionist and the local public health agency should fax the lab report and/or other information to the CADE. The confidential fax number is (515) 281-5698.

2. Case Investigation

a. Ensure that typing of the *Haemophilus influenzae* isolate has been or is being done, preferably at the SHL.

b. The local public health agency in conjunction the hospital infection preventionist will collect pertinent information (demographic, clinical, exposure setting, transmission setting, detailed immunization history, and other pertinent history on the case) and record in the Iowa Disease Surveillance System (IDSS). To assess and prepare for the possibility of a type b case, it is important to pay special attention to the case's Hib vaccination history, whether the case had contact with another case of invasive Hib, whether a child care setting is involved, and the ages and Hib vaccination histories of children exposed to the case in the household and child care center.

c. If type b is identified, notify CADE (800) 362-2736.After completing the investigation and gathering the information to complete the investigation form, enter information into IDSS, or FAX the report form with supporting laboratory documentation to (515) 281-5698

d. If type b is not identified, no additional control measures are necessary and a case investigation form does not need to be completed.

3) CONTROLLING FURTHER SPREAD

Control measures are for *Haemophilus influenzae* type b (Hib) *only*. There are no control measures for other types.

A. Isolation and Quarantine Requirements

Current recommendations are as follows:

Period of Isolation of Patient

Isolate the case until 24 hours after initiating appropriate antimicrobial treatment to eliminate carriage. Cefotaxime and ceftriaxone or chloramphenicol is recommended for treatment concurrently or singly until antibiotic sensitivities are known. Rifampin should be given to eliminate nasal carriage of the organism.

Protection of Contacts

Prophylaxis is indicated to protect children less than 12 months old or a child of 1-3 years who is inadequately immunized. If this circumstance is found, everyone around them, including household contacts of any age, should receive prophylaxis.

When 2 or more cases of invasive disease have occurred within 60 days and unimmunized or incompletely immunized children attend the child-care facility, administration of rifampin to all attendees and supervisory personnel is indicated. For a single case of Hib disease in a child who attends childcare, the decision to offer chemoprophylaxis to the childcare contacts should be made based on a case by case basis.

B. Protection of Contacts of a Case

1. **Isolate the case** until 24 hours after initiating appropriate antimicrobial treatment. Currently, only the treatment drugs cefotaxime and ceftriaxone are known to eradicate Hib from the nasopharynx. Patient's who are younger than 2 years of age or have susceptible household contacts, treated with ampicillin or chloramphenicol, must also receive rifampin prophylaxis to eliminate nasal carriage. Also, note that Hib disease does not necessarily confer immunity to subsequent disease. Immunize as follows:
   - **Children with invasive Hib disease at less than 24 months old**—immunize according to the age-appropriate schedule for unvaccinated children and as if they had received no prior doses. Begin 1 month after onset of disease or as soon as possible thereafter. For additional information, please refer to the table in Section 4) B. 3.
   - **Children with invasive Hib disease at <u>older than</u> 24 months old**—no immunization is necessary, regardless of previous immunization status, because the disease probably induced a protective immune response and second episodes at this age are rare.

2. **Antimicrobial prophylaxis for close contacts.** Although several antibiotics are useful for *treatment* of invasive Hib disease and elimination of carriage in the case, rifampin is the appropriate drug to use for antibiotic *prophylaxis* of contacts. Several studies have shown that rifampin eradicated Hib carriage in <u>greater than or equal to</u> 95% of contacts of primary Hib cases, including children in child cares.

   Prophylaxis is needed when contacts include children less than 12 months old who have not received a primary vaccine series, or a child of 1-3 years who is inadequately immunized, or a household with an immunocompromised child regardless of that child's Hib immunization status.

   If the criteria in the above paragraph are met, prophylaxis should be initiated as soon as possible. Most secondary cases in households occur in the first week after hospitalization of the index case. Prophylaxis of household contacts that begins <u>more than or equal to</u> 1 week after hospitalization of the case may still be of benefit, although initiation of prophylaxis beyond 4 weeks after that date is probably of limited utility. It is important for all children and employees having at least four hours of contact with the ill child in the week before onset or hospitalization

to take rifampin, unless immunization criteria are met. Prophylaxis is not recommended for pregnant women who are contacts because the effect of rifampin on the fetus has not been established.

Rifampin Prophylaxis against Hib	
Age Group	**Dosage/Schedule**
Infants < 1 month of age	10 mg/kg PO QD x 4 days
Children	20 mg/kg PO QD x 4 days (maximum: 600 mg/dose)
Adults	600 mg PO QD x 4 days

The risk of secondary disease in children attending child-care centers appears to be lower than that observed for age-susceptible household contacts, and secondary disease in child-care contacts is rare when all contacts are older than 2 years. Also, the efficacy of rifampin in preventing disease in child care groups is not established. Nevertheless, rifampin prophylaxis is recommended in certain situations, as indicated in the table below.

Indications and Guidelines for Rifampin Chemoprophylaxis for Contacts of Index Cases of Invasive *Haemophilus influenzae* Type b (Hib) Disease

Chemoprophylaxis recommended

- In certain index cases:
  - Index case, if treated with regimens other than cefotaxime or ceftriaxone. Chemoprophylaxis (rifampin) usually is provided just before discharge.
- In certain household situations:
  - All household contacts (except pregnant women),[1] irrespective of age, in households where at least 1 contact is < 48 months of age *and* is unimmunized or incompletely immunized[1]
  - All household contacts (except pregnant women),[1] irrespective of age, in households where a child is < 12 months of age, even if the primary series has been given
  - All household contacts (except pregnant women),[1] irrespective of age, in households with an immunocompromised child, irrespective of the child's Hib immunization status
- In certain child care situations:
  - Nursery and child care centers contacts where $\geq$ 2 cases occurred within 60 days, with $\geq$ 1 unimmunized or incompletely immunized child < 48 months of age[2,3] For a single case of Hib disease in a child who attends childcare, the decision to offer chemoprophylaxis to the childcare contacts should be made based on a case by case basis.

Chemoprophylaxis *not* recommended

- In certain individuals:
  - Pregnant women
- In certain household situations:
  - Occupants of households with no children < 48 months of age other than the index patient
  - Occupants of households when all household contacts < 48 months of age have completed their Hib immunization series[4]
- In certain child care situations:
  - Nursery and child care contacts of 1 index case, when all children < 48 months of age have completed their Hib immunization series[4]
  - Nursery and child care center contacts where $\geq$ 2 cases occurred within 60 days, when all children < 48 months of age have completed their Hib immunization series[4]

[1] Defined as persons residing with the index patient or nonresidents who spent ≥ 4 hours with the index case for ≥ 5 of the 7 days preceding the day of hospital admission of the index case.
[2] Only children who are age-appropriately immunized and on rifampin should be permitted to enter the child care group during the time prophylaxis is given. Children enrolling in the child care center or other setting during the time prophylaxis is given should also receive rifampin, as should supervisory personnel.
[3] When a single case has occurred, the advisability of rifampin prophylaxis in exposed child care groups with unimmunized or incompletely immunized children is controversial, but many experts recommend no prophylaxis.
[4] Complete immunization is defined as having had ≥ 1 dose of conjugate vaccine at ≥ 15 months of age; 2 doses between 12 and 14 months of age; or a 2- or 3-dose primary series (number of doses required depends on vaccine type and age at initiation) when < 12 months with a booster dose at ≥ 12 months of age. Note that all infants (< 12 months of age) are by definition incompletely immunized.

3. **Ensure appropriate immunization of contacts.** The number of doses required is determined by the current age of the child and the number, timing, and type of Hib vaccine doses previously received. Unvaccinated and incompletely vaccinated children less than 5 years old should be scheduled for completion of the recommended age-specific immunization schedule (see definition of "complete immunization" in Footnote 4 of the table above). Infants should be placed on an accelerated schedule using minimum intervals between doses. Unvaccinated high-risk individuals older than 5 years should receive one dose.

   The accelerated schedule for situations in which an incompletely vaccinated child has been exposed follows:

Accelerated schedule for Hib vaccination—to be used for unvaccinated and incompletely vaccinated children (including all infants) after exposure to invasive Hib disease.

Type of Hib vaccine	Minimum age for first dose	Minimum interval from dose 1 to 2	Minimum interval from dose 2 to 3	Minimum interval from dose 3 to 4
HbOC (HIB-TITER®)	6 weeks	1 month	1 month	This booster at ≥ 12 mo. of age and ≥ 2 mo. after previous dose
PRP-T (ActHIB®, OmniHIB®)	6 weeks	1 month	1 month	
PRP-OMP (PedVax-HIB®)	6 weeks	1 month	This booster at ≥ 12 mo. of age and ≥ 2 mo. after previous dose	Not required

4. **Conduct surveillance.** Careful observation of exposed contacts, especially children younger than 4 years, is essential. Those in whom a febrile illness develops should receive prompt medical attention, regardless of Hib vaccination status.

D. Preventive Measures

Routine childhood vaccination is the best preventive measure against Hib disease. Good personal hygiene (which consists of proper handwashing, disposal of used tissues, not sharing eating utensils, etc.) is also important.

Please consult the chapter on *Haemophilus influenzae* in the Red Book of the American Academy of Pediatrics for a full discussion of vaccines, immunization schedules, and special circumstances. For example, children, including those older than 5 years, with underlying conditions predisposing them to Hib disease may need additional doses.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Haemophilus influenza type b can be found at:
www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Comment

Positive antigen test results from urine or serum samples are unreliable for diagnosis of *H. influenzae* disease, but may help determine need for control measures while waiting for definitive laboratory results.

References

American Academy of Pediatrics. *Red Book 2009*: *Report of the Committee on Infectious Disease, 28th Edition*. Illinois, American Academy of Pediatrics, 2009.
CDC. Progress toward elimination of *Haemophilus influenzae* type b disease among infants and children—United States, 1987–1995. *MMWR.* 1996; 45:901–906.
CDC. Updated Recommendations for Use of *Haemophilus influenzae* Type b (Hib) Vaccine: Reinstatement of the Booster Dose at Ages 12--15 Months. *MMWR*. 2009; 58(24);673-674
CDC. *Manual for the Surveillance of Vaccine-Preventable Disease.* CDC, 2008..
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Resources

www.cdc.gov/vaccines/vpd-vac/hib/default.htm
State Hygienic Laboratory www.shl.uiowa.edu/

FACT SHEET *Haemophilus Influenzae* Type b

(Hib, H. flu, haemophilus b)

What is *Haemophilus influenzae* type b disease?
Haemophilus influenzae type b (Hib) causes a serious bacterial infection in young children, most commonly meningitis (infection of the coverings of the spinal cord and brain). Some persons who recover from Hib meningitis may have long-lasting brain and nerve problems. Hib can also cause blood infections, pneumonia, arthritis, and infections in other parts of the body. In some instances, Hib disease may cause death.

Who gets Hib disease?
Hib disease is most common in children between 3 months and 3 years of age.

How is Hib disease spread?
It is spread through the air after an infected person coughs or sneezes, especially if he/she does not cover their mouth or nose.

What are the symptoms of Hib disease?
Hib disease usually causes fever, nausea and vomiting. Persons with Hib disease may become irritable or sluggish. The bacteria can infect different parts of the body, so other symptoms may occur.

How long is an infected person able to spread Hib disease?
An infected person can spread Hib disease for as long as the bacteria are present in the nose and throat, even after he appears to be well or after 1 to 2 days of treatment with effective antibiotic therapy.

Can a person get Hib disease again?
Yes, one infection does not protect from getting Hib disease again.

What is the treatment for Hib disease?
Antibiotics are used to treat serious infections.

Should people who have been around a person infected with Hib disease be treated?
Some household members, child care playmates, and children under 4 years of age who have been around an infected person may need to take an antibiotic like Rifampin to prevent illness in themselves or those around them. Persons who have had casual contact in a regular classroom, office, or factory setting usually do not need treatment.

How can the spread of Hib disease be stopped?
There are several vaccines for Hib disease currently available. The vaccine should be given to young children beginning at 2 months old. This is especially important for those children attending child care. For more information about the Hib vaccine, contact your local health department.

Note: This is a sample letter to be adapted on local or state health department letterhead and to be used when case is reported within 14 days after case's last day in a child care.

PARENT AND EMPLOYEE ADVISORY LETTER
***Haemophilus influenzae* invasive disease in a Child care Center**

Dear Parents of (name of child):

Your child has been in contact with a child who has had disease caused by a bacteria called *Haemophilus influenzae* (commonly called *"H. flu*" or Hib). Despite its name, the bacteria has nothing to do with flu virus and does not cause "the flu". Hib can cause pneumonia, joint, blood, and skin infections, and meningitis in children under four years old.

Because your child was in contact with the child with *H. flu* disease for more than four hours in the week before the child's illness, the Iowa Department of Public Health and the _____ Health Department recommend that your child take an antibiotic called rifampin to reduce his/her risk of developing a serious *H. flu* infection. Your child may need rifampin whether or not his/her vaccination is complete. Please contact your child's pediatrician or family doctor to obtain this medication as soon as possible. Persons who are known to be allergic to rifampin, and women who are pregnant or who might be pregnant shouldn't take rifampin. Persons wearing soft contact lenses should remove the lenses for the four-day treatment period as rifampin may discolor them. Rifampin will turn the urine a reddish-orange color and may decrease the effectiveness of birth control pills.

Watch for the following signs of infection in your child: high fever, irritability, breathing difficulty, or other unusual behavior accompanied by fever. If your child develops any of these symptoms in the next few weeks, you should contact his/her doctor, explain the symptoms and tell the doctor that your child was in contact with a child who had a serious *H. flu* infection.

Please feel free to contact the _____ Health Department at (telephone number) or the Iowa Department of Public Health, Center for Acute Disease Epidemiology, (800) 362-2736, if you have questions regarding this subject.

There is now a vaccine to prevent *H. flu* disease, including meningitis. It is recommended that all children receive a series of a Hib conjugate vaccine beginning at two months of age. If your child is two months of age or older, and has not received this vaccine consult your physician or your local health department to obtain this vaccine, commonly referred to as Hib vaccine.

For child care employee exposure, rifampin is recommended to eliminate the *H. flu* organism from the employee's nose and throat to prevent children under four years in the center from having further exposure to *H. flu*.

Sincerely,

_____ _____
(Name) (Local Health Department)

Note for your doctor: The recommended dose of rifampin for *H. flu* prophylaxis is 20 mg/kg once daily for four days (maximum dose 600 mg/day); for infants less than 1 month old, 10 mg/kg once daily for 4 days.

Note: Sample letter to be adapted on local or state health department letterhead and to be used when case is reported more than 14 days after case's last day in a child care

PARENT INFORMATION LETTER
Haemophilus influenzae invasive disease in a child care center

Dear Parents Of (name of child):

Your child has been in contact with a child who has had a serious disease caused by a bacteria called *Haemophilus influenzae* (commonly called "*H. flu*" or Hib). If your child is at least 15 months old and up to date on his or her immunizations, they are probably fully protected against H. flu infection. The bacteria has nothing to do with flu virus and does not cause "the flu", despite its name. *H. flu* can cause pneumonia, blood, joint and skin infections, and meningitis in children less than four years of age. There is a small risk that children spending several hours with the child with *H. flu* disease in the days prior to illness might develop a serious *H. flu* infection. An antibiotic called rifampin can reduce this risk if given soon after exposure. Since your child's exposure occurred more than 14 days ago, we are not currently recommending rifampin. Please contact your child's doctor to discuss this exposure.

Watch for the following signs of infection in your child: high fever, irritability, breathing difficulty, or other unusual behavior accompanied by fever. If your child develops any of these symptoms in the next few weeks, you should contact his or her doctor immediately and tell the doctor that your child was in contact with a child who had a serious *H. flu* infection.

Please feel free to contact the _____ Health Department at (telephone number) or the Iowa Department of Public Health, Center for Acute Disease Epidemiology, (800) 362-2736 if you have questions regarding this subject.

A vaccine is available for children two months of age and older to prevent *H. flu* disease, including meningitis. It is recommended for all children to receive a series of an approved Hib conjugate vaccine beginning at two months of age. If your child is two months of age or older, consult your physician, or your Local health department to obtain Hib vaccine.

Sincerely,

_____ _____

(Name) (Local Health Department)

FACT SHEET *Haemophilus influenzae* type b
FOR CHILD CARE ADMINISTRATORS

- *Haemophilus influenzae* type b (Hib) is an important cause of serious disease in young children. Commonly called *H. flu*, this bacteria has nothing to do with flu virus and does not cause "the flu."

- Approximately 23 cases of invasive Hib disease were reported in 2003.

- Nearly all cases of Hib disease occur in children under 4 years old and most cases occur in children between 2 months to 3 years. For children who develop meningitis, 2-5% will die and most of the survivors will have permanent neurologic problems such as hearing loss or deafness, learning disabilities and mental retardation.

- There have been numerous clusters of cases reported in child cares of all types (babysitters, mother's day out, home child cares and centers).

- Symptoms of the disease vary with the type of illness the child develops, but high fever, irritability, lethargy or other unusual behavior are consistent with Hib disease.

- The bacteria are spread from person-to-person by contact with the organisms found in nose and throat secretions through coughing, sneezing, etc. The reasons that some children become ill and others do not is not clearly understood.

- An antibiotic, rifampin, eliminates the Hib bacteria from the nose and throat of persons carrying it, thus reducing the risk of exposed young children developing a serious Hib infection. It is important for all children and employees having at least four hours of contact with the ill child in the week before onset or hospitalization to take rifampin, unless immunization criteria are met. Call the Iowa Department of Public Health, Center for Acute Disease Epidemiology, (800) 362-2736 for follow-up assistance. This prevents disease in those already exposed.

- Persons who are known to be allergic to rifampin and women who are pregnant or who might be pregnant should not take rifampin. Persons wearing soft contact lenses should remove the lenses for the four day treatment period as rifampin may discolor them. Rifampin will turn the urine a reddish-orange color and may decrease the effectiveness of birth control pills.

- There are now several vaccines to prevent Hib disease. All children should receive the full Hib series. The approved conjugate vaccines are recommended for all children beginning at 2 months old.

- For further information, contact your local health department or the Iowa Department of Public Health, Center for Acute Disease Epidemiology (800) 362-2736.

Haemophilus influenzae B (HIB)

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Date of Death / / ☐ Unknown
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory:
Date received: / /
Result type: ☐ Preliminary ☐ Final
Accession #:
Specimen source:
Test type: ☐ Gram stain ☐ PCR ☐ Latex agglutination ☐ Culture ☐ Immuno-histochemistry
Collection date: / /
Result date: / /
Result: ☐ Positive ☐ Negative ☐ No growth
Serogroup: ☐ A ☐ B ☐ C ☐ W-135 ☐ Y
Organism: ***Neisseria meningitidis***

Laboratory:
Date received: / /
Result type: ☐ Preliminary ☐ Final
Accession #:
Specimen source:
Test type: ☐ Gram stain ☐ PCR ☐ Latex agglutination ☐ Culture ☐ Immuno-histochemistry
Collection date: / /
Result date: / /
Result: ☐ Positive ☐ Negative ☐ No growth
Serogroup: ☐ A ☐ B ☐ C ☐ W-135 ☐ Y
Organism: ***Neisseria meningitidis***

Laboratory: _____ Specimen source: _____ Result: ☐ Positive ☐ Negative ☐ No growth

Date received: / / Test type: ☐ Gram stain ☐ PCR ☐ Latex agglutination ☐ Gram stain ☐ Culture ☐ Immuno-histochemistry

Result type: ☐ Preliminary ☐ Final Collection date: / / Serogroup: ☐ A ☐ B ☐ C ☐ W-135 ☐ Y

Accession #: Result date: / / Organism: ***Neisseria meningitidis***

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admission date: / / Discharge date: / /

Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Days hospitalized: _____ Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

Purpura fulminans present: ☐ Yes ☐ No ☐ Unk

Infection type: ☐ Primary bacteremia ☐ Meningitis ☐ Pericarditis ☐ Epiglottitis ☐ Peritonitis ☐ Pneumonia ☐ Arthritis ☐ Septecemia ☐ Other _____

Other infection type (specify):

Spinal tap performed ☐ Yes ☐ No ☐ Unk Date / /

Normal ☐ Yes ☐ No ☐ Unk

Spinal Fluid Results

Protien _ __unit Glucose _ __unit White Blood Count _ __unit

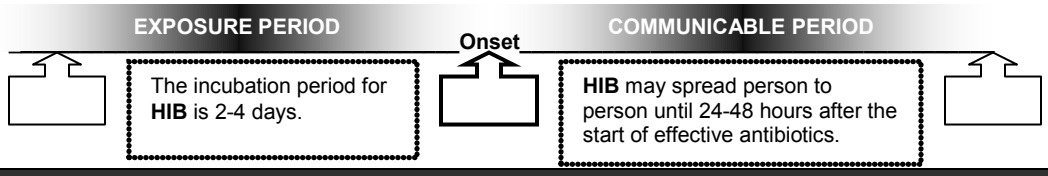
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU # of days:	Unit: ☐ mg ☐ ml ☐ IU # of days:	Unit: ☐ mg ☐ ml ☐ IU # of days:
# of times a day: Route:	# of times a day: Route:	# of times a day: Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated for *Haemophilus influenzae* type B: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

Number of vaccinations: ____

CONTACTS

Number of people living in case's household: _____ **Number of people living in case's home age 3 or less_:** _____

Close contacts of the case: ☐ Yes ☐ No ☐ Unknown

Close contacts of the case

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

PROPHYLAXIS

Vaccinated for HIB: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /

Lot #:

Vaccine type:

Manufacturer:

Antibiotics prescribed: ☐ Yes ☐ No ☐ Unknown

Antibiotic:

Date started: / /

Dose:

Unit: ☐ mg ☐ ml ☐ IU

# of times a day: Route:

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		/ /	☐ Yes
☐ Child	☐ Family member (non-household)			☐ No
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

PROPHYLAXIS

Vaccinated for HIB: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /

Lot #:

Vaccine type:

Manufacturer:

Antibiotics prescribed: ☐ Yes ☐ No ☐ Unknown

Antibiotic:

Date started: / /

Dose:

Unit: ☐ mg ☐ ml ☐ IU

# of times a day: Route:

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		/ /	☐ Yes
☐ Child	☐ Family member (non-household)			☐ No
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

PROPHYLAXIS

Vaccinated for HIB: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /

Lot #:

Vaccine type:

Manufacturer:

Antibiotics prescribed: ☐ Yes ☐ No ☐ Unknown

Antibiotic:

Date started: / /

Dose:

Unit: ☐ mg ☐ ml ☐ IU

# of times a day: Route:

NOTES:

Hansen's Disease (Leprosy)

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown Date of death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

See Other Lab Findings

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type:
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown
Date worked from: / /
Date worked to: / /
Removed from duties: ☐ Yes ☐ No ☐ Unknown
Date removed: / /

Job title:
Facility name:
Address:
Zip code:
City: State: County:
Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Hypopigmented skin lesion: ☐ Yes ☐ No ☐ Unknown
Anesthetic skin lesions: ☐ Yes ☐ No ☐ Unknown
Red papules or nodules: ☐ Yes ☐ No ☐ Unknown
Papules bilateral: ☐ Yes ☐ No ☐ Unknown
Thickening of skin at papules or nodules: ☐ Yes ☐ No ☐ Unknown
Hypopigmented macules with ill-defined borders: ☐ Yes ☐ No ☐ Unknown

OTHER LAB FINDINGS

Biopsy performed: ☐ Yes ☐ No ☐ Unknown
Date of biopsy: / / Biopsy site: Result:
Acid fast test performed: ☐ Yes ☐ No ☐ Unknown

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

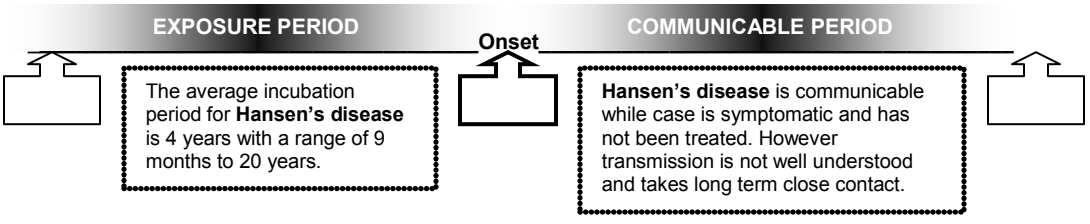
Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____ # of times a day: _____
Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____ # of times a day: _____
Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____ # of times a day: _____
Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

In the 20 years prior to the onset of symptoms:

Has the case lived outside the U.S.: ☐ Yes ☐ No ☐ Unknown

Country: From date: / / To date: / /

Country: From date: / / To date: / /

Country: From date: / / To date: / /

Has the case had armadillo contact?
☐ Yes ☐ No ☐ Unknown From date: / / To date: / /

CONTACTS

Number of people living in case's household: _____

List all close contacts

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

HANSEN'S DISEASE

Also known as: Leprosy

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone. Send isolates to the State Hygienic Laboratory (SHL) for testing
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Report by facsimile, mail or phone. Follow Up Required

Iowa Department of Public Health
Disease Reporting Hotline: (800)-362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Hansen's disease (also called leprosy) is a chronic infectious disease caused by the bacterium *Mycobacterium leprae*. Even though the medical community is moving away from using diseases named after people, this is one that will retain the moniker "Hansen's" disease because of the stigma of the name leprosy.

B. Clinical Description

A chronic bacterial disease characterized primarily by the involvement of skin, which can also involve peripheral nerves, testicles, and the mucosa of the upper airway. Clinical forms of Hansen's disease represent a spectrum reflecting the degree of cellular immune response to *Mycobacterium leprae.* The following characteristics are typical of the major forms of the disease.

- Tuberculoid**:** One or a few well-demarcated, hypopigmented, and anesthetic skin lesions, frequently with active, spreading edges and a clearing center; peripheral nerve swelling or thickening also may occur.
- Lepromatous**:** A number of erythematous papules and nodules or an infiltration of the face, hands, and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin.
- Borderline (dimorphous): Skin lesions characteristic of both the tuberculoid and lepromatous forms.
- Indeterminate**:** Early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features.

Its main targets are the skin and nerves, though other organs can be involved. If not treated, the nerves are damaged and patients may be unable to feel, which can result in injuries or burns. Such wounds may result in ulcers. The patient may suffer muscle weakness and paralysis. Serious disabilities and deformities may occur. Prompt and appropriate treatment prevents most of these complications.

C. Reservoirs

Humans are the only reservoir of proven significance for leprosy. There have been reports suggesting that leprosy in armadillos may be naturally transmitted to humans.

D. Modes of Transmission

Although the mode of transmission of Hansen's disease remains uncertain, most investigators think that *M. leprae* is usually spread from person to person in respiratory droplets after prolonged close contact. Most humans probably are not susceptible.

E. Incubation period

The incubation period probably ranges from 9 months to 20 years.

F. Period of Communicability or Infectious Period

Evidence suggests that infectiousness is lost in most instances within a day of beginning treatment with multidrug therapy.

G. Epidemiology

While worldwide prevalence of leprosy decreased to less than 1 million registered cases in 1998, incidence has changed little since 1985. The majority of cases occur in developing countries, with 92% in just 16 countries, led by India and Brazil. In the United States, cases usually occur in immigrants or refugees. Although leprosy affects people of all ages and gender, cases in children under 3 years of age are rare.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify source of infection and possible modes of acquisition.
- To connect infected individual with available free treatment from CDC.
- To ensure that close contacts, primarily family, are examined for possible disease and treatment is initiated.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) performs acid-fast bacillus smear testing, which will detect *M. leprae*. Although it is not possible to grow *M. leprae* in culture, further testing of specimens may be coordinated between SHL and the CDC. For more information, call the SHL Mycobacteriology department at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-up Responsibilities

Follow up is required. Make sure household and close contacts are assessed for disease. Periodic examination of household and other close contacts is recommended at 12-month intervals for at least 5 years after last contact with an infectious case.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

No restrictions, but should be under medical care.

Minimum Period of Quarantine of Contacts

No restrictions.

B. Protection of Contacts of a Case

Handwashing is recommended for all contacts of lepromatous cases, and appropriate disposal of nasal discharges of the case should be considered during the infectious period.

D. Preventive Measures

Detection and treatment of cases is needed to prevent further spread. Antibiotics for treatment can be provided through the National Hansen's Disease Program, www.hrsa.gov/hansensdisease/

Preventive Measures/Education

- Education of the case should stress the availability and efficacy of therapy.
- Education on the importance of following the medication regime exactly.
- Education of the case's household contact(s) should include modes of transmission, preventive therapy (if appropriate), and referral to a healthcare provider for follow-up.
- It is important to convey to the case and contacts the low communicability of this disease and the availability of effective treatment and prevention regimens.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hansen's Disease can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.
CDC. Case Definitions for Infectious Conditions under Public Health Surveillance, 1997: www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.
Jacobson, R., Krahenbuhl, J., Leprosy, *The Lancet*, 1999; 353: 655–60.

FACT SHEET Hansen's disease
(Leprosy)

What is Hansen's disease?
Hansen's disease (commonly referred to as Leprosy) is a chronic disease due to an infection with a bacterium similar to the bacterium that causes tuberculosis. The main targets are the skin and nerves, though other organs can be involved. If not treated, the nerves are attacked and patients may be unable to feel pain when they get injured or burn themselves. The resulting wound may lead to ulcers. In addition, muscle weakness and paralysis may occur. Serious disabilities such as deformities may occur. However, prompt and appropriate treatment prevents most of these complications.

What are the symptoms of Hansen's disease?
Hansen's disease is associated with skin lesions (located identically on both sides of the body), spots on the skin that are light colored, bumps, and thickened skin. The nose is often affected, causing congestion and nosebleeds.

How soon do symptoms appear?
Symptoms of Hansen's disease usually will not start to appear until *several years* after contact with a person with this disease.

How is Hansen's disease spread?
Although the exact method of spread is not clear, it appears that this disease is spread by tiny droplets from the nose. However, not all people are susceptible, or prone, to getting this disease. In fact, only 5% of the population is thought to be susceptible. In addition, it appears that living in the same household with a person with this disease for a long period of time is necessary for spread of this disease; casual contact with someone over brief periods of time does not put people at risk.

How long is a person infectious?
Once a person has been on medication for 3 days, he or she can no longer spread the disease to others and can return to usual activities.

What is the treatment for this illness?
There are effective antibiotics that can be used to treat this disease, but these antibiotics must be taken over a long period of time (at least two years).

Do infected people need to be excluded from school, work, or child care?
People with Hansen's disease, including healthcare providers, can return to their usual activities (including work and school) after being on medications for 3 days. After this time, they are no longer considered to be able to spread this to others.

Hantavirus Pulmonary Syndrome

Also known as: Hantavirus Disease, HPS, Sin Nombre Virus

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physician: Report by facsimile, mail or phone
Local public health agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

The genus *Hantavirus*, family Bunyaviridae, comprises at least 14 viruses, including those that cause hemorrhagic fever with renal syndrome (HFRS) and hantavirus pulmonary syndrome (HPS). Hantaviruses are primarily rodent-borne.

Hantavirus pulmonary syndrome (HPS) occurs in the U.S. with most of the cases being associated with Sin Nombre virus (SNV). Other agents include Black Creek Canal virus and Bayou virus.

HFRS is caused by puumala virus in Europe. Seoul virus, which is widely distributed, also causes HFRS of variable severity as does Hantaan virus, which is found principally in Asia. Renal failure and hemorrhagic manifestations, common in HFRS, have been mild or absent in most recognized cases of HPS.

B. Clinical Description

Symptoms: during the 3 to 5 day prodrome are non-specific flu-like symptoms, including fever, fatigue, and muscle aches, especially in the large muscle groups. Gastrointestinal manifestations or dizziness may also occur.

Onset: As the disease progresses, symptoms can include cough and shortness of breath as the lungs fill with fluid. Once the cardiopulmonary phase begins, the disease progresses rapidly, necessitating hospitalization and often assisted ventilation within 24 hours.

Complications: of HPS include an acute febrile illness that progresses rapidly to severe respiratory failure (acute respiratory distress syndrome or ARDS) and shock. The mortality rate is still not well known but appears to be approximately 40%. For survivors, recovery from the acute illness is rapid with apparent restoration of normal lung function.

C. Reservoirs

Common reservoirs: The main reservoir for Sin Nombre virus is the deer mouse, *Peromyscus maniculatus*, native to most of the United States.

Less Common reservoirs: Black Creek Canal virus is associated with the cotton rat, *Sigmodon hispidus*, is found in the southeastern U.S. The rice rat, *Oryzomys palustris*, found in the southern U.S., is a reservoir for Bayou virus.

D. Modes of Transmission

Infected rodents shed live virus in their saliva, feces and urine.
Airborne: Humans are infected when they inhale dust that contains dried contaminated rodent urine or feces. Transmission may also occur when dried materials contaminated by rodent feces or urine are disturbed and are directly introduced into broken skin or the eyes, nose or mouth.

Person-to-person: There is no evidence of person-to-person transmission of HPS in the United States.

E. Incubation period

The incubation period is weakly defined, but is thought to be approximately 2 weeks, with a range of a few days to 6 weeks.

F. Period of Communicability or Infectious Period

Person to person spread of hantaviruses appears to be rare, but further study is needed.

G. Epidemiology

HPS was first recognized in 1993 following an outbreak in the southwestern United States. As of November, 2013, 585 cases have been identified in the U.S. About 75% of patients with HPS have been residents of rural areas. Most cases have occurred in spring or summer, although cases have occurred throughout the year. Cases of HPS have also been reported in Canada and in several countries in South America. Anyone whose occupational activities (biologists, pest-control workers, etc.) or recreational activities (hikers, campers, etc.) put them in frequent contact with rodents or their droppings are potentially at risk. Disturbing, cleaning or inhabiting closed, actively rodent-infested structures is an important risk factor.

H. Bioterrorism Potential

Category C agent. Third-highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of availability, ease of production and dissemination and potential for high morbidity and mortality and major health impact.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To assess the magnitude of the disease in different areas and among different risk groups.
- To identify outbreaks as soon as possible.
- To identify rodent sources of infection.
- To monitor the emergence of HPS in new areas and new risk groups.
- To design more effective control or prevention methods.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the clearinghouse.
Call (319) 398-5133 or visit the website
healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) tests for hantavirus. For more information on submitting specimens contact SHL at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency (LPHA) Follow-up Responsibilities

Case Investigation

a. Case investigation of hantavirus disease in Iowa residents will be directed by the IDPH Center for Acute Disease Epidemiology (CADE).

b. Following notification of IDPH, the LPHA(s) may be asked to assist in completing an official IDPH investigation. Access the Iowa Disease Surveillance System (IDSS) to conduct the investigation. Interview the case and/or others who may be able to provide information to complete the investigation form and then enter into IDSS. Most of the information required can be obtained from the healthcare provider or the medical record. Use the following guidelines to assist in completing the form:
   1) Record "Hantavirus Disease" (or "Hantavirus Pulmonary Syndrome") as the disease being reported.
   2) Record the case's demographic information.
   3) Record the date of symptom onset, symptoms, date of diagnosis, hospitalization information (if applicable), and outcome of disease (*e.g.,* recovered, died).
   4) Exposure history: Use the approximate incubation period range for hantavirus (1-6 weeks). Specifically, focus on the period beginning about 1 week prior to the case's onset date back to approximately 6 weeks before onset for the following exposures:
      a) Travel history: Determine the date(s) and geographic area(s) visited by the case.
      b) Rodent contact: Ask the case about potential direct or indirect occupational or recreational exposure to rodents and/or rodent droppings. Document in the "Notes" section.
   5) Complete the import status section to indicate where hantavirus was acquired. If unsure, check "Unknown." Include any additional comments regarding the case.
   6) If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please enter as much information as can be gathered. If the information cannot be obtained, please explain the reason in the "Notes" section in IDSS. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

c. If IDSS is not being used, after completing the form, attach lab report(s) if available and mail (in an envelope marked "confidential") to IDPH Center for Acute Disease Epidemiology. The mailing address is:

   IDPH, CADE
   Lucas State Office Building, 5th Floor
   321 E. 12th Street
   Des Moines, IA 50319-0075

d. Institution of disease-control measures is an integral part of case investigation. It is the LPHA's responsibility to understand, and, if necessary, institute the control guidelines below.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If any cases of Hantavirus infection are reported in your county or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. Consult with an epidemiologist at CADE at (800) 362-2736. CADE can help determine a course of action to prevent further cases and perform surveillance for cases that may cross several county lines and therefore be difficult to identify at a local level.

D. Preventive Measures

Environmental Measures

The best way to prevent HPS is to eliminate or minimize human contact with rodents.

- Clear brush, grass, and garbage from around building foundations to eliminate a source of nesting materials. Keep tight-fitting lids on all garbage.
- Use metal flashing around the base of wooden, earthen or adobe dwellings to provide a strong metal barrier.
- Seal all entry holes one-fourth inch wide or wider with lath screen or lath metal, cement, wire screening or other patching materials, inside and out.
- Elevate hay, woodpiles and garbage cans to eliminate possible nesting sites.
- Use an EPA-approved rodenticide with bait under plywood or plastic shelter along baseboards, or trap and properly dispose of rodents. Live trapping of rodents is not recommended.
- Clean all food-preparation areas. Store all food (both human and pet) in rodent-proof containers.
- Do not leave open bowls of pet food outside. Discard any uneaten pet food properly at the end of the day.

Preventive Measures/Education

People involved in cleaning rodent-contaminated areas should keep the following in mind:

- Clean droppings using a wet method, rather than a dry method such as sweeping or vacuuming. Spray disinfectant, such as dilute bleach, prior to cleaning and use a wet mop or towels moistened with disinfectant to clean. This prevents dust from being produced.
- Work in well-ventilated areas. If possible before cleaning areas that have been closed for prolonged periods, open windows and allow to air out for 24 hours before initiating cleaning.
- In areas of heavy infestation gloves, dust-mist masks, long-sleeved clothing, and protective eyewear may help prevent exposure.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hantavirus can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 66th Edition*. Illinois, American Academy of Pediatrics, 2006.
CDC Website. Hantavirus, *www.cdc.gov/hantavirus/*
Heymann, D. L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC: American Public Health Association, 2008.

Additional Resources

www.nlm.nih.gov/medlineplus/ency/article/001382.htm

FACT SHEET HANTAVIRUS PULMONARY SYNDROME

What is Hantavirus Pulmonary Syndrome (HPS)?

It is a respiratory disease caused by a member of the hantavirus famly called Sin Nombre virus. This virus is carried in wild rodents such as deer mice (*Peromyscus maniculatus*). Mice do not appear ill while carrying it.

How does a person get HPS?

People become infected after breathing in airborne particles of urine, droppings or saliva from infected rodents. Most cases in the U.S. have been associated with occupying rodent-infested vacant cabins or other dwellings, cleaning barns or other outbuildings, disturbing rodent-infested areas while hiking or camping, planting or harvesting fields, and living in or visiting areas where there has been an increase in rodents. Handling infected rodents, their nests or droppings, and then touching the nose, mouth, or eyes may spread the virus. There is no evidence of person-to-person spread.

Who can be affected by HPS?

Anyone can get HPS.

Can animals transfer HPS?

Cats and dogs are not known to spread the hantavirus from rodents to people. Predators such as snakes, hawks, owls and coyotes help control rodents and do not spread the disease.

What are the symptoms of HPS infection?

The first symptoms, appearing a few days to six weeks (usually 2 weeks) after contact with the virus, are flu-like and may include fever, muscle and body aches, chills, cough, headaches, nausea, vomiting, and diarrhea, or feeling tired. The lungs then begin filling with fluid, making breathing difficult. If you have been exposed to rodents and experience these symptoms, notify your healthcare provider immediately.

How should I get rid of dead rodents, droppings or nests?

Removing the rodents from your home will decrease your risk for HPS. Follow these standard rodent-removal and clean-up guidelines:

- Set spring traps that will kill mice.
- Wear rubber gloves. Spray the nest and/or dead rodent with a household disinfectant solution of 3 tablespoons of bleach in 1 gallon of water until thoroughly soaked. Other disinfectants can also be used as directed. Let the area soak thoroughly for 10-15 minutes.
- Remove the nest and/or rodent using a long-handled shovel or rubber gloves.
- Double-bag the rodent and/or nest securely with plastic bags and dispose of them in the trash. People in rural areas may bury the waste 2-3 feet deep.
- While still wearing gloves, wipe up the area with paper towels or rags. Double-bag all paper towels, rags, and gloves used in the cleanup. Dispose of them in a tightly covered trash container.
- Clean gloves before taking them off with disinfectant or soap and water.
- Wash your hands with soap and water after completing the cleanup.

How should I clean my home after rodents are removed?

Floors, countertops, cabinets and other surfaces should be cleaned. Use a solution of bleach or other household disinfectant. A solution of 1½ cups of household bleach in 1 gallon of water (or a 1:10 solution) can be used in place of a commercial disinfectant. Avoid spilling the mixture on clothing or other items that might be damaged by bleach. Wear rubber, latex, vinyl, or nitrile gloves when preparing and using chlorine solutions. They should be prepared fresh daily. Do not sweep floors with a broom, or vacuum, until the area has been disinfected. Rugs can be steam cleaned. Hard floors should be sprayed with a disinfectant solution.

How can I prevent rodents from entering my home?

- Seal, cover or screen all holes in walls or floors larger than one-quarter inch.
- Keep food (including pet food) and water covered and stored in rodent-proof metal or thick or thick plastic containers with tight-fitting lids. Clean up spilled food. Keep dishes clean.
- Store garbage in rodent-proof metal or thick containers with tight-fitting lids. Keep containers at least 12 inches off the ground.
- Place three inches of gravel under the base of mobile homes to discourage rodent burrowing.
- Place wood piles 100 feet or more away from the house and elevate wood at least one foot off the ground.
- Remove any food sources near buildings that might attract rodents.

CONFIDENTIAL

Iowa Department of Public Health

Hantavirus

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Fever: ☐ Yes ☐ No ☐ Unk Onset of fever date: / / Highest known fever: °F/C
Other Symptoms: ☐ Fever ☐ Hypotension ☐ Muscle Pain ☐ Respiratory distress ☐ Shock
Chest X-ray done: ☐ Yes ☐ No ☐ Unk Date of chest X-ray: / / X-ray result:
Unexplained Bilateral Infiltrates on X-ray: ☐ Yes ☐ No ☐ Unk
X-ray suggestive of RDS: ☐ Yes ☐ No ☐ Unk
Respiratory compromise requiring oxygen: ☐ Yes ☐ No ☐ Unk
Oxygen saturation less than 90% at any time: ☐ Yes ☐ No ☐ Unk
Tissue specimens available for testing: ☐ Yes ☐ No ☐ Unk

Other explanations for acute illness:

OTHER LAB FINDINGS

Thrombocytopenia: ☐ Yes ☐ No ☐ Unk Elevated hematocrit: ☐ Yes ☐ No ☐ Unk Hypoalbuminaemia: ☐ Yes ☐ No ☐ Unk

TREATMENT

For the illness, were any of the following treatments required?

Intubation: ☐ Yes ☐ No ☐ Unk Duration: _____ ☐ Hours ☐ Days

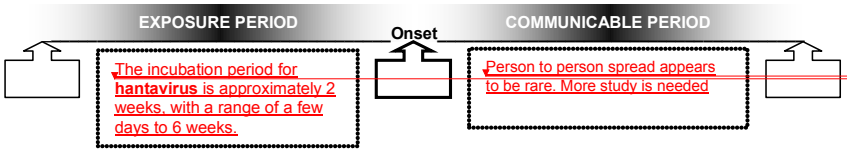
Respiratory assistance: ☐ Yes ☐ No ☐ Unk Duration: _____ ☐ Hours ☐ Days

Oxygen: ☐ Yes ☐ No ☐ Unk

Ventilator: ☐ Yes ☐ No ☐ Unk Duration: _____ ☐ Hours ☐ Days

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



Deleted: The incubation period for **hantavirus** is a few days to 6 weeks.

Deleted: Person to person spread was documented in one outbreak. Hantavirus is communicable while an infected person is symptomatic.

RISK FACTORS/TRAVEL

In the 6 weeks prior to illness was the case:

Exposed to rodents/rodent droppings: ☐ Yes ☐ No ☐ Unknown Exposure date: / / Rodent Type _____

State within US: _____ City within US: _____

NOTES: _____

Hemolytic Uremic Syndrome (HUS) and Thrombotic Thrombocytopenic Purpura (TTP)

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone,
Lab: Report by IDSS, facsimile, mail or phone, send isolate to SHL - (319) 335-4500
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Report by IDSS, facsimile, mail or phone. Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Hemolytic uremic syndrome (HUS) is a syndrome of anemia, renal failure and low platelet count, for which there are several causes. Among children, the most common cause of HUS is infection with a Shiga toxin-producing organism, most commonly *Escherichia coli* O157:H7 or some other strain of enterohemorrhagic *E. coli* (EHEC). *Shigella dysenteriae* also produces Shiga toxin and HUS can also occur after infection with this organism.

Thrombotic thrombocytopenic purpura (TTP) is a disorder characterized by lesions in various organs that contain platelet clots, low platelet counts, and hemolytic anemia [due to breakdown of red blood cells (RBC)]. Tissue hypoxia resulting from these clots may cause organ damage, most frequently affecting the nervous system or kidney.

B. Clinical Description

HUS is an acute illness involving the renal system and blood clotting mechanisms. For HUS caused by infection with a Shiga toxin-producing organism, the syndrome will usually manifest itself within weeks after the onset of a diarrheal illness, which often includes bloody diarrhea. Worldwide approximately 2–7% of cases of enterohemorrhagic *E. coli* (EHEC), such as *E. coli* O157:H7, develop HUS.

Thrombotic thrombocytopenic purpura (TTP) is another potential consequence of infection with a Shiga toxin-producing organism. TTP symptoms include hemolytic anemia and signs of intravascular hemolysis, low platelet count, diffuse and nonfocal neurologic findings, decreased renal function, and fever.

HUS is most commonly seen in children, whereas TTP is more commonly seen in adults.

Both syndromes can be fatal. Most cases of HUS, but few cases of TTP, follow an acute gastrointestinal illness (usually diarrhea). Only HUS or TTP that follows an acute diarrheal illness should be reported.

C. Reservoirs

While cattle appear to be the most significant reservoir for *E. coli* O157:H7 and other EHEC strains, other animals, such as deer, are also known to carry these bacteria. In contrast, humans are the only known reservoir for *Shigella dysenteriae.*

D. Modes of Transmission

See the chapters on *E. coli* -pathogenic and *Shigella* for modes of transmission for each organism.

E. Incubation Period

Onset of HUS or TTP usually occurs within 3 weeks of the onset of diarrhea. Diarrhea may have resolved and the case may appear to be improving when the onset of HUS or TTP occurs. (For the incubation periods of the specific bacteria, refer to the chapters on *E. coli* -pathogenic and *Shigella.*)

F. Period of Communicability or Infectious Period

People with HUS or TTP rarely are infectious due to shedding *E. coli* or *Shigella* in their stool. (Refer to the chapters on each of these organisms for information on their infectious periods.) These illnesses usually do not appear until after the shedding period is over. Thus, at this time, stool specimens are negative.

G. Epidemiology

HUS is seen worldwide and may occur in 2% - 7% of *E. coli* EHEC infections of children under 10 years of age. A bacterial pathogen is often not laboratory confirmed in cases of HUS, and therefore, the proportion of cases of HUS due to specific bacterial infections is difficult to ascertain. Cases of HUS have been attributed to several non-O157:H7 *E. coli* serotypes (e.g*.,* other EHEC strains). Treatment with TMP-SMX, fluoroquinolones and other antibiotics may increase the risk of HUS and other complications.

Post diarrheal TTP is seen less frequently than HUS.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- HUS has been clearly demonstrated to be an important sequela of infection with *E. coli* EHEC strains. Because HUS cases generally come to medical attention, surveillance for HUS can serve as a marker for *E. coli* EHEC activity in the community and may lead to the identification of outbreaks at the state or local level. HUS is also an important event for assessing morbidity caused by *E. coli* EHEC strains.
- TTP may also occur after infection caused by E. coli EHEC, therefore risk factors for the disease must be assessed as in HUS.
- To identify whether the case may be a source of infection for other persons (*e.g.,* a diapered child, child care attendee or food handler) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (*e.g.,* a restaurant or a commercially contaminated food product) and to stop transmission from such sources.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider report any case of HUS or TTP related to *E. coli* O157:H7 or enterohemorrhagic *E. coli* (non-O157). The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. After completing the investigation and gathering the information to complete the investigation form, enter information into IDSS, or FAX the report form with supporting laboratory documentation to (515) 281-5698 or mail (in an envelope marked “Confidential”) to the IDPH/CADE, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Laboratory Testing Services Available

After communicating with IDPH, contact the University of Iowa State Hygienic Laboratory (SHL) bacteriology for further instructions at (319) 335-4500.

C. Local Public Health Agency Reporting and Follow-Up Responsibilities

1. Case Investigation

a. It is the LPHA responsibility to complete a *HUS Disease Case nvestigation form* by interviewing the case and others who may be able to provide pertinent information. The Iowa Disease Surveillance System (IDSS) is the preferred method of recording case information.

b. Use the following guidelines to assist you in completing the investigation:
   1) Accurately record the demographic information, date of symptom onset, symptoms, and medical information.
   2) When asking about exposure history (food, travel, activities, etc.), use the incubation period of 21 days.
   3) If possible, record any restaurants at which the case ate, including food item(s) and date consumed. If it is suspected that the case became infected through undercooked food, especially ground meats, refer to the Iowa Foodborne Illness Outbreak Investigation Manual.
   4) Ask questions about unpasteurized juices and the water supply.
   5) Ask what grocery stores they have bought food at.
   6) Household/close contact, pet or other animal contact, child care, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts. Determine whether the case attends or works at a child care facility or is a food handler.
   7) If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), complete the case report with as much information as possible. Note on the form the reason why it could not be filled out completely, or if using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

c. After completing the case investigation form, enter the data into IDSS, FAX or mail to CADE. Reports may be faxed to CADE's secured fax at 515 281-5698. The mailing address is:

   Iowa Department of Public Health
   Center for Acute Disease and Epidemiology
   321 East 12th Street
   Des Moines, Iowa 50319

d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

HUS and TTP are not spread person to person. If shigella or *E. coli* EHEC strains are determined to be the cause of the illness see chapters specifically dealing with those diseases.

Note: Because the onset of symptoms of HUS or TTP usually occur within 3 weeks after diarrheal illness, stool cultures taken at the time of HUS or TTP frequently fail to identify a causative agent.

A. Isolation and Quarantine Requirements

Standard Precautions while hospitalized.

B. Protection of Contacts of a Case

Persons caring for the case should practice good hygiene with attention to good handwashing practices.

C. Managing Special Situations

See chapters on specific enteric disease.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in your city/town is higher than usual, or if an outbreak is suspected, an investigation is indicated and consideration should be given to early consultation with CADE. Investigate clustered cases in an area or institution to determine source of infection and mode of transmission. A common vehicle (such as water, food or association with a child care center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist on-call at the CADE at (800) 362-2736. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several county lines and therefore be difficult to identify at a local level.

Note: Refer to the Iowa's *Foodborne Illness Outbreak Investigation Manual* for comprehensive information on investigating foodborne illness complaints and outbreak.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for HUS can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.
CDC Website. *Escherichia coli* O157:H7. www.cdc.gov/nczved/dfbmd/disease_listing/stec_gi.html
Heymann, D.L., ed., *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Additional Resources

Centers for Disease Control and Prevention: www.cdc.gov/ecoli/general/index.html#what_shiga
Iowa Division of Inspections and Appeals, Food Inspections:
www.state.ia.us/government/dia/index.html

FACT SHEET Hemolytic Uremic Syndrome

(HUS)

What is Hemolytic Uremic Syndrome (HUS)?
HUS is an illness in which the red blood cells are destroyed and the kidneys fail. HUS is a condition that can follow diarrhea caused by certain kinds of bacteria*, including E. coli O157:H7* (and other *E. coli strains)* or *Shigella dysenteriae*. It can be serious, however, only a small percent of people with *E. coli* or *Shigella dysenteriae* develop HUS. Not all cases of HUS are caused by infection with these bacteria.

How is HUS spread?
HUS cannot be spread between people. However, the bacteria *E. coli (O157:H7* and others) and *Shigella dysenteriae*, that can cause HUS, can be spread to others if personnel hygiene is not good. Handwashing and correct food handling are always important.

Who gets HUS?
Anyone can get HUS but children under five and the elderly are at higher risk.

What are the symptoms of HUS?
People with HUS may have less urine output, tiredness, or sometimes, blood in the urine.

How soon do symptoms appear?
HUS caused by *E. coli (O157:H7* and others) or *Shigella dysenteriae* infection usually occurs within three weeks after onset of diarrhea.

What should you do if you think you may have HUS?
Contact your doctor right away.

Can HUS occur more than once?
HUS can occur following any infection with *E. coli (O157:H7* and others) or *Shigella dysenteriae*, or sometimes after other less common bacterial infections.

How is HUS prevented?
Handwashing and safe food handling greatly reduce the risk of HUS by reducing the chances of becoming infected with *E. coli (O157:H7* and others) or *Shigella dysenteriae*.

Hemolytic Uremic Syndrome (HUS)

Investigator: Agency: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Serotype:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Serotype:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Serotype:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Ext: Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Ext: Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admission date: / / Discharge date: / /

Days hospitalized: _____

Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Developed anemia: ☐ Yes ☐ No ☐ Unknown

Microangiopathic changes present: ☐ Yes ☐ No ☐ Unknown

Antacids taken: ☐ Yes ☐ No ☐ Unknown

Diarrhea within 3 weeks of onset of HUS: ☐ Yes ☐ No ☐ Unk

Clinical indicators: ☐ Elevated creatine level ☐ Proteinuria ☐ Hematuria

Brand Name: _____

HUS Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

TTP Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

Symptoms

Diarrhea	☐ Yes ☐ No ☐ Unk	____ Days/Hours		Abdominal cramps	☐ Yes ☐ No ☐ Unk	____ Days/Hours	
Nausea	☐ Yes ☐ No ☐ Unk	____ Days/Hours		Chills	☐ Yes ☐ No ☐ Unk	____ Days/Hours	
Vomiting	☐ Yes ☐ No ☐ Unk	____ Days/Hours		Fever	☐ Yes ☐ No ☐ Unk	____ Days/Hours	
Headache	☐ Yes ☐ No ☐ Unk	____ Days/Hours		Visible bloody diarrhea	☐ Yes ☐ No ☐ Unk	____ Days/Hours	
Muscle weakness	☐ Yes ☐ No ☐ Unk	____ Days/Hours					

First symptom: Most severe symptom: Date returned to normal activities: / /

OTHER LAB FINDINGS

Food, Medication, or environmental samples tested? ☐ Yes ☐ No ☐ Unk

Describe samples: _____

For what were the samples tested ? ☐ E. coli or EHEC ☐ Salmonella ☐ Shigella

Laboratory: Positive? ☐ Yes ☐ No ☐ Unk PFGE performed? ☐ Yes ☐ No ☐ Unk

PFGE Pattern:

IAX Pattern		JXB Pattern		XbaI-Pattern		BInI-Pattern	

TREATMENT

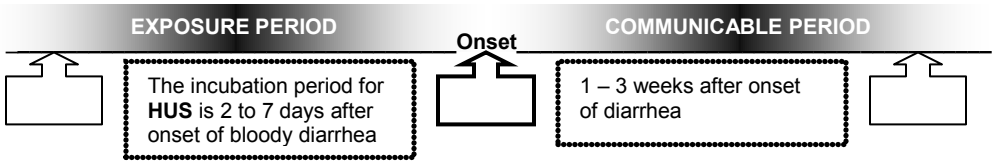
Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:		Antibiotic:	
Date started:	/ /	Date started:	/ /
Dose:		Dose:	
Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU
# of days:		# of days:	
# of times a day:		# of times a day:	
Route:		Route:	

Antibiotic:		
Date started:	/ /	
Dose:		
Unit:	☐ mg ☐ ml ☐ IU	
# of days:		
# of times a day:		
Route:		

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL *(include 10 days before onset of diarrhea)*

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:	Departure date: / /	Return date: / /
Traveled within U.S.? ☐ Yes ☐ No ☐ Unk	State: City:	Departure date: / /	Return date: / /
Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:	Departure date: / /	Return date: / /

Restaurants visited? ☐ Yes ☐ No ☐ Unknown *If Yes, complete the table below:*

Restaurant	Adress/Zip	Date visited	Foods eaten	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attended Group Gatherings? ☐ Yes ☐ No ☐ Unknown *If Yes, complete the following table:*

Type of gathering	Address/Zip	Date visited	Foods consumed	Foods prepared	Others ill?
		/ /			☐ Yes ☐ No ☐ Unk
		/ /			☐ Yes ☐ No ☐ Unk
		/ /			☐ Yes ☐ No ☐ Unk

Dietary Information – *In the 10 days prior to onset of diarrheal symptoms did the case:*

Purchase food products? ☐ Yes ☐ No ☐ Unknown *If Yes, complete the table below:*

Store name	Address	City/State/Zip	County	Date purchased
				/ /
				/ /
				/ /

Meat and poultry

Were any of the following consumed? ☐ Poultry ☐ Ground meat ☐ Meat other than ground meat:

Was the meat fully cooked? ☐ Yes ☐ No ☐ Unknown

List all source/types: _____

List all brand names: _____

From dates consumed: / / , / / To dates consumed: / / , / /

Other meat and poultry products

Deli/luncheon meat ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw/partially cooked eggs: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasturized products

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized juice: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other unpasteurized products: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other products

Health supplements: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Infant formula: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Baby food: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Fruits and vegetables

Raw fruits: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw vegetables: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other

Leftover foods consumed: ☐ Yes ☐ No ☐ Unk Reheated: ☐ Yes ☐ No ☐ Unk From date consumed: / / To date consumed: / /

Animal Exposures – ***In the 10 days prior to the onset of diarrhea***

Check all that apply

Visit or live on a farm: ☐ Yes ☐ No ☐ Unknown

Exposed to manure: ☐ Yes ☐ No ☐ Unknown

Farm animal contact: ☐ Yes ☐ No ☐ Unknown Animals:

Reptile contact: ☐ Yes ☐ No ☐ Unknown ☐ Iguana ☐ Lizard ☐ Turtle ☐ Other _____

Reptile lived with case: ☐ Yes ☐ No ☐ Unknown

Other animal contact in home: ☐ Yes ☐ No ☐ Unknown Animal: Animal sick: ☐ Yes ☐ No ☐ Unk

Visited a petting zoo: ☐ Yes ☐ No ☐ Unknown Touched animals: ☐ Yes ☐ No ☐ Unk Animal:

Zoo name: Address/Zip/County:

Water Exposures – *In the 10 days prior to the onset of diarrhea*
Went swimming? ☐ Yes ☐ No ☐ Unknown *If Yes, complete the table below:*

Type	Location Type	Date visited	Facility name/ Street address & Zip
☐ Hot tub/spa ☐ Pond ☐ Kiddie pool ☐ Water park ☐ River/stream ☐ Swimming pool ☐ Lake ☐ Water fountain/ splash pad ☐ Other_____	☐ Hotel/motel ☐ Indoor private ☐ Indoor public ☐ Outdoor private ☐ Outdoor public	___/___/___	

Water supply

Home:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**School:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	
Work:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**Child care:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	

Other Exposures – *In the 10 days prior to the onset of diarrhea did the case:*

Wear diapers: ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unknown

Have contact with immunocompromised person: ☐ Yes ☐ No ☐ Unk Setting: ☐ Home ☐ Work ☐ Other _____

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

Participate in outdoor activities: ☐ Yes ☐ No ☐ Unk Activities: ☐ Camping ☐ Canoeing ☐ Fishing ☐ Hiking ☐ Hunting ☐ Rafting ☐ Trapping

CONTACTS

Number of people living in case's household: _____

Are there close contacts of the case with same symptoms: ☐ Yes ☐ No ☐ Unknown

Name	DOB	Gender	Address/Phone
	___/___/___	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case	List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Sexual contact ☐ Child ☐ Family member (non-household) ☐ Sibling ☐ Friend/acquaintance ☐ Roommate ☐ Contact- work/school/etc ☐ Parent/ guardian ☐ Unknown/Other		___/___/___	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	___/___/___	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case	List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Sexual contact ☐ Child ☐ Family member (non-household) ☐ Sibling ☐ Friend/acquaintance ☐ Roommate ☐ Contact- work/school/etc ☐ Parent/ guardian ☐ Unknown/Other		___/___/___	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	___/___/___	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case	List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Sexual contact ☐ Child ☐ Family member (non-household) ☐ Sibling ☐ Friend/acquaintance ☐ Roommate ☐ Contact- work/school/etc ☐ Parent/ guardian ☐ Unknown/Other		___/___/___	☐ Yes ☐ No

HEPATITIS A

Also known as: Infectious hepatitis, Epidemic hepatitis, Epidemic jaundice, Catarrhal jaundice, Type A hepatitis, HA, HAV

Responsibilities:
Hospital: Report by IDSS, facsimile, or phone
Lab: Report by IDSS, facsimile, or phone
Physician: Report by facsimile, or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Hepatitis A is an infection primarily affecting the liver caused by the hepatitis A virus (HAV), a nonenveloped RNA virus that is classified as a picornavirus.

B. Clinical Description

Initial symptoms: - Over 70% of infections in children <6 years of age are asymptomatic. The proportion of symptomatic infections increases with age. The onset of hepatitis A in adults is usually abrupt. Initial symptoms may include low grade fever (usually < 39.5^{o} C), myalgia, mild headache, malaise, anorexia, nausea and abdominal discomfort; some individuals may experience diarrhea.

Subsequent symptoms: One to seven days after initial symptoms jaundice (yellowing of the skin and sclera), dark urine and clay-colored stool may occur. Among older children and adults, infection is typically symptomatic, with jaundice occurring in > 70 % of patients. The duration of a typical course of hepatitis A is 2 – 6 weeks.

Complications: may involve a prolonged, relapsing hepatitis, which can occur for up to one year. Relapsing hepatitis occurs in about 15% of cases. Hepatitis A is rarely fatal and has no chronic carrier state. The elderly and persons with chronic liver disease are at greater risk of fulminant (rapid and severe) hepatitis A. The greatest morbidity and mortality occurs in person greater than 50 years old. Hepatitis A is clinically indistinguishable from other types of hepatitis. It must be diagnosed through laboratory testing for hepatitis A IgM.

C. Reservoir

Humans with active infections (symptomatic or not) are the only natural reservoir for this disease. It is rarely found in chimpanzees or other primates.

D. Modes of Transmission

The primary modes of transmission are direct or indirect person-to-person spread via the fecal-oral route, including sexual contact, or ingestion of contaminated food or water. Transmission occurs most frequently among close contacts, especially in households and extended family settings. Virtually any food can be involved including ready-to-eat or uncooked food (sandwiches, salads, ice cream, strawberries, etc.), which can become contaminated by an infected food worker with poor hygiene; inadequate treatment of stool-contaminated drinking water (a rare source of hepatitis A in Iowa); contaminated produce (such as lettuce or strawberries irrigated or processed with contaminated water); or shellfish harvested from fecally contaminated waters and then consumed

raw or undercooked. The foods most commonly contaminated are raw, wet, and rough, such as lettuce and ice. Because the virus is present in blood during the illness prodrome, HAV has been transmitted on rare occasions by blood transfusion. Hepatitis A has been transmitted among drug users by fecally contaminating drug paraphernalia that is being shared.

E. Incubation Period

The incubation period for hepatitis A ranges from 15 -50 days, with an average of 28 – 30 days. The incubation period may be shorter with a greater hepatitis A virus (HAV) dose.

F. Period of Communicability or Infectious Period

Individuals are usually most infectious from 1 week before their symptoms begin to several days after onset of jaundice. Viral shedding in the stool is greatest during the week before symptom onset, until several days after onset. Virus excretion begins to decline at the onset of clinical illness, and has decreased significantly 7 – 10 days after onset of symptoms. If diarrhea exists, the patient's ability to transmit the virus is greatly enhanced. HAV infection provides lifelong immunity.
For public health intervention, a case is considered to be potentially infectious from 14 days before the onset of symptoms to 7 days after onset of symptoms. However, prolonged viral excretion (up to 6 months) has been documented in infants and children. Chronic shedding of HAV in feces does not occur.

G. Epidemiology

Hepatitis A has a worldwide distribution and occurs as sporadic cases and outbreaks. In countries where sanitation is poor, infection is common and occurs at an early age. Adults, therefore, are usually immune and outbreaks are uncommon. In developed countries, disease transmission is a problem in child care settings with diapered children, among household and sexual contacts of acute cases, among travelers to countries where the disease is common, and among the institutionalized. In some situations drug users can be at high risk.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (*e.g.,* a diapered child, child care attendee, drug user or food handler) and if so, to prevent further transmission.
- To identify sources of public health concern (*e.g.,* a salad bar prepared by an infectious food handler) and to stop transmission from such a source.
- To quickly identify contacts so that post exposure prophylaxis with hepatitis A vaccine or Immune Globulin (IG) can be given as soon as possible and within 14 days of last exposure.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is by immediate phone call. The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698.

Due to potentially serious public health implications, it is requested that acute or active (IgM +) cases of hepatitis A identified in food service workers, child care employees and attendees be reported by phone to CADE immediately (800) 362-2736, so post-exposure prophylaxis can be started as soon as possible for contacts at high risk of disease. These are considered public health emergencies.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) tests single serum samples for Hepatitis A IgM antibody utilizing enzyme immunoassays. Accurate information about date of collection, dates of onset of symptoms, travel history, vaccination and disease history are essential for test

interpretation. For additional information on submitting samples or testing, contact the State Hygienic Laboratory at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. Confirm the diagnosis.

1) Was a hepatitis A IgM serology done?

Yes. Continue to step 2

No. Is the case epidemiologically linked to a confirmed case or a documented outbreak of hepatitis A?

An epidemiologically linked case is a case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

Yes. Continue to b.

No. Assess if serology testing for hepatitis A IgM is indicated. If not indicated, no further investigation is necessary.

2) Is the individual's **anti-HAV IgM** positive?

Yes. Continue to step b.

No. No further case investigation is necessary.

b. Completing the Hepatitis A Case Investigation.

Utilizing the Iowa Disease Surveillance System (IDSS) is the preferred way to conduct the investigation. The local public health agency (LPHA) should complete the Hepatitis A investigation by contacting the healthcare provider and interviewing the case and others who may be able to provide the pertinent information. Much of the information required can be obtained from the case's healthcare provider, other involved medical providers, or the medical record. The case record will aid in determining the most probable source of the infection, whether the case is likely to transmit the infection to others, and whether contacts should be given hepatitis A vaccine or immune globulin (IG).

c. Determine if the case is associated with a common-source outbreak. If yes, contact CADE at (800) 362-2736.

- Does the case know of other persons with hepatitis A or with similar symptoms?
- Have any other cases investigated provided similar information (e.g., history of eating raw oysters from a particular food establishment, etc.)?
- If the case is child care-associated, refer to the managing special situations section for appropriate follow-up.

d. The main objective in following up a case of hepatitis A is to determine whether the case is likely to have transmitted the infection to others.

- Determine when the acute symptoms occurred and period of communicability of the case (two weeks before to one week after onset.)
- Determine whether the case is likely to have transmitted the infection to others. Likely transmission can occur in situations where a case is identified as a food handler, a patient care provider or is an employee or child at a child care setting during their infectious period.

e. Use the following guidelines to complete the case investigation form:

1) **Onset:** Because a case of hepatitis A is most infectious in two weeks before symptom onset until one week after, be sure to accurately record each symptom and its date of onset. If onset of symptoms is unclear, use the date when jaundice was first noticed as the date of onset.

2) **Occupation:** These questions (food handler, employment sections) are asked to determine the case's risk of transmitting the illness during the period of communicability (14 days before onset of symptoms to 7 days after) via food, including during patient care which can

involve feeding. Determine whether the case is a food handler or patient care provider. If so, appropriate control measures need to be instituted. **If the case is a foodservice worker, child care, or healthcare provider, call CADE immediately at (800) 362-2736.**

3) **Child care settings (and other similar settings):** These questions are asked because hepatitis A is spread through the fecal-oral route. Children with hepatitis A are often asymptomatic; however, they may still be shedding the virus in their stool. Persons who are exposed to the fecal material of these cases could be exposed to hepatitis A. Determine whether the case is a child, resident or employee in a supervised care facility. If so, appropriate control measures need to be instituted. See child care assessment tool in the Epi Manual's Hepatitis A section.
4) **Risk factors/travel:** Using the incubation period for hepatitis A (2 to 6 weeks), ask the case about food consumption, supervised care settings, and other exposures during the incubation period before the illness started.
    a. **Contact with known cases:** These questions are asked because hepatitis A can be spread through household or sexual contact.
    b. **Vaccination history for hepatitis A.** Document previous doses of hepatitis A vaccine, if any.
    c. **Travel history:** These questions are asked in order to identify where the patient may have become infected. Because of poor sanitation and overcrowding, hepatitis A is endemic in many developing countries. A recent history of foreign travel may be indicative of foreign exposure.
    d. **Food consumption:** Questions about raw shellfish consumption should be asked because occasionally hepatitis A virus infection has been associated with ingestion of uncooked or partially cooked shellfish grown in sewage-contaminated waters. Ask about other high-risk foods such as salads, ice and sandwiches with lettuce and tomato. If it is suspected that the case became infected through the consumption of shellfish or other food(s), the LPHA should notify CADE, which can work in coordination with the Department of Inspection and Appeals Food and Consumer Safety Division to determine if additional control measures are warranted.
    e. **Contacts:** Complete contact information documenting type of contact, symptoms (if present) and whether post exposure prophylaxis (PEP) was given, as well as the type of PEP given.

4). **Every effort should be made to complete the investigation because of the potential for outbreak with this disease**. If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), complete the IDSS case investigation form with as much information as can be gathered and notify CADE, which may be able to assist in the investigation.

After completing the case investigation, enter information into IDSS or fax along with lab reports to CADE at (515) 281-5698.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

All hospitalized patients are on Standard Precautions.

Diapered or incontinent patients should be placed on Contact Precautions:

Infants and children <3 years of age for duration of hospitalization
Children 3-14 years of age for 2 weeks after onset of symptoms
>14 years of age for I week after onset of symptoms

At home, counsel the patient to modify activities in order to prevent transmission until the end of the infectious period or one week after onset of symptoms. The patient should not prepare food for others, and practice good handwashing after toileting. Persons assisting a patient with toileting should practice good hand washing and wash the patient's hands after toileting.

Persons who are child care or healthcare providers and food handlers should not work until 7 days after onset of jaundice or two weeks after the onset of symptoms.

Minimum Period of Quarantine of Contacts

None

B. Protection of Contacts of a Case

Persons who have documentation of previous hepatitis A disease or of receiving hepatitis A vaccine at least one month before an HAV exposure do not need post-exposure prophylaxis. For public health intervention, a case is considered to be potentially infectious from 14 days before the onset of symptoms to 7 days after onset of symptoms. Fecal shedding of the virus peaks during the 2 weeks before onset of symptoms until several days after onset. If diarrhea exists, it greatly enhances a case's ability to transmit virus. Control measures are implemented through the administration of hepatitis A vaccine or immune globulin (IG) to the people who had contact (see definition of contact directly below) with the case during their infectious period. Healthy persons between the ages of 12 months and up to and including 40 years of age can receive single antigen hepatitis A vaccine or IG. Hepatitis A vaccine is preferred for this age group. For persons 41 years of age or older, IG is preferred but vaccine can be used if IG cannot be obtained. IG should be used for children under the age of 12 months.

The safety of hepatitis A vaccination during pregnancy has not been determined; however, because hepatitis A vaccine is produced from inactivated hepatitis A virus, the theoretic risk to the developing fetus is expected to be low. The risk associated with vaccination should be weighed against the risk for hepatitis A in pregnant women who might be at high risk for exposure to hepatitis A.

Post exposure prophylaxis should be administered as soon as possible and within 14 days of last exposure to an infectious case. Persons who receive immune globulin and for whom hepatitis A vaccine is recommended for other reasons should receive a dose of hepatitis A vaccine to provide long term protection at the same time they receive IG. This would include persons routinely recommended to receive hepatitis A vaccine as listed below. For persons who receive vaccine, the second dose should be administered through their healthcare provider according to the licensed schedule to complete the series. Combination hepatitis A and B vaccine **is not** to be used for post exposure prophylaxis. In persons exposed more than 14 days ago, vaccine or IG treatment will not prevent the illness. Those persons should watch for symptoms of hepatitis A and practice good hygiene, including frequent hand washing with soap and water. They should see their healthcare provider and notify public health if symptoms develop.

A *contact* is defined as:
All household members; sexual contacts; persons who have shared illicit drugs with the case, food handling employees who work with the case; and anyone consuming uncooked foods or foods handled after cooking prepared by an infectious case that had diarrhea or poor hygienic practices at the time of food preparation. Other household-like contacts (e.g. baby sitter that comes in routinely).

Immune Globulin:

The following persons should not receive immune globulin:

1. Persons with known immunoglobulin A (IgA) deficiency.
2. Persons with severe thrombocytopenia or any blood coagulation disorder which would contraindicate intramuscular injections.

Caution should be used in giving IG to a patient with a history of anaphylactic reactions to immune globulins. IG is not recommended for persons who have clinical symptoms strongly indicative of hepatitis A.

Immune globulin may interfere with immunizations for measles, mumps, rubella, and chickenpox. These live attenuated vaccines should not be given for at least three (3) months after administration of IG. Also, if it is necessary to administer IG within the 2 weeks following MMR or varicella vaccine the vaccine should be repeated. The repeat dose of MMR or varicella vaccine should not be given sooner than three (3) months after IG.

Hepatitis A Vaccine

Persons routinely recommended to receive hepatitis A vaccine:

- Children at 12–23 months of age. Vaccination should be integrated into the routine childhood vaccination schedule. Children who are not vaccinated by 2 years of age can be vaccinated at subsequent visits.
- Travelers to high or intermediate risk countries.
- Men who have sex with other men.
- Persons who use illegal drugs.
- Persons who have clotting factor disorders.
- Those who work with hepatitis A-infected primates or with hepatitis A virus in a laboratory setting.
- Susceptible persons who have chronic liver disease.
- Susceptible persons who either are awaiting or have received liver transplants should be vaccinated.
- Any person one year old or older who wants protection from Hepatitis A.

C. Managing Special Situations

Child Care

If a confirmed case of hepatitis A occurs in a child care setting, parents and staff must be notified. Hepatitis A fact sheets should be provided at that time.

Hepatitis A vaccine or IG should be administered to all previously unvaccinated staff members and attendees of child care or homes if

1) One or more cases of hepatitis A are recognized in children or employees. In centers that do not provide care to children who wear diapers, hepatitis A vaccine or IG need be administered only to classroom contacts of the index case.
2) Cases are recognized in two or more households of center attendees. In centers that do not provide care to children who wear diapers, hepatitis A vaccine or IG need be administered only to classroom contacts of the index case.

When an outbreak occurs (i.e., hepatitis A cases in three or more families), hepatitis A vaccine or IG should also be considered for members of households that have children (center attendees) in diapers.

- Enforce policies about hand hygiene (with children and staff) and disinfection of objects and environmental surfaces with appropriate bleach solutions or other solutions that state they kill HAV.
- Make sure all parents and staff notify the health department if any person in their household is diagnosed with hepatitis A.

Exclusion Guidelines

People who are sick with hepatitis A can return to the program no less than two weeks after the illness started or one week after onset of jaundice.

Schools and Work Settings

Hepatitis A postexposure prophylaxis is not routinely indicated when a single case occurs in an elementary or secondary school or other work setting and the source of the infection is outside the school or work setting. Careful hygienic practices should be emphasized, including availability of hand hygiene supplies. Hepatitis A vaccine or IG should be administered to persons who have had close contact with the index case if an epidemiologic investigation indicates HAV transmission has occurred among students in a school.

Hospitals

When a person who has hepatitis A is admitted to a hospital, staff members should be using standard precautions and therefore not be exposed to hepatitis A. Routine administration of hepatitis A post-exposure prophylaxis should not be needed: instead, careful hygienic practices should be emphasized. Hepatitis A vaccine or IG should be administered to persons who have close contact with index patients if an epidemiologic investigation indicates HAV transmission has occurred among patients or between patients and staff members in a hospital.

If a hospital staff member is diagnosed with hepatitis A and is considered a food handler then the food handler guidelines must be followed.

Cases who are healthcare providers should not work until 7 days after onset of jaundice or two weeks after the onset of symptoms.

Community Residential Programs

Actions taken in response to a case of HAV in a community residential program should be handled on a case-by-case basis. Management of contacts will depend on the level of hygiene of the case and the type of facility. Roommates should be given hepatitis A vaccine or IG as soon as possible, and within 14 days of last exposure. If hepatitis A occurs in a staff member of a residential program, the case should be considered a food handler if there was an opportunity to feed, distribute medication, prepare foods or perform oral hygiene during the 2 weeks prior to symptom onset and 1 week after symptom onset. Consult with an epidemiologist at CADE by calling (800) 362-2736.

Food Handler

A food handler is any person directly preparing or handling food, including a patient care or child care provider, or homemaker.

A confirmed case of hepatitis A in a food handler is a public health emergency and requires that risk for both co-workers and the public be assessed immediately. If a food handler is a laboratory-confirmed case of hepatitis A, all other food handling employees in the facility must receive hepatitis A vaccine or IG as soon as possible, unless the contact can produce documentation of hepatitis A virus (HAV) vaccination or can show serologic immunity to HAV disease. Even after receiving hepatitis A vaccine or IG, they should wash hands correctly and protect READY-TO-EAT FOOD from contamination introduced by bare hand contact for the next 6 weeks to prevent the spread of infection. If the employee does become sick, the employee should stop working immediately and be tested for HAV IgM antibodies.

In order to determine if the public needs to be notified of possible exposure to HAV, a complete food handling history of the case for the 2 weeks before and one week after symptom onset needs to be done. This history should include consistency of correct handwashing procedure, presence of diarrhea, dates worked, job duties, foods prepared, and whether gloves or other barrier protection were used by the food handler. See the Epi Manual's Hepatitis A section for the food handler assessment worksheet. Please call CADE at (800) 362-2736 to help determine the risk to the general public and to arrange shipment of prophylactic hepatitis A vaccine or IG.

Cases who are food handlers should not work until 7 days after onset of jaundice or two weeks after the onset of symptoms.

Refer to Acute Hepatitis A Management in the Food Handler flowchart.

Hepatitis A vaccine or IG administration to patrons is usually not recommended, but can be considered if:

- During the time when the food handler was likely to be infectious they had diarrhea or poor hygienic practices and directly handled foods served uncooked or handled foods after cooking, *and*
- Patrons can be identified and treated within 2 weeks after the exposure.

- In settings where repeated exposures to HAV might have occurred (*e.g.,* institutional cafeterias), stronger consideration for more widespread hepatitis A vaccine IG use may be warranted.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in a city/town is higher than usual, or if an outbreak is suspected, investigate clustered cases in the area or institution to determine the source of infection and mode of transmission. A common vehicle (such as food or association with a child care center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist at CADE by calling (800) 362-2736**.** CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several county lines and therefore be difficult to identify at a local level.

D. Preventive Measures

Personal Preventive Measures/Education

Individuals can avoid exposure to the virus by taking the following measures.

- Wash hands thoroughly with soap and water, especially before handling or eating food, after toilet use, and after changing diapers.
- In child care or residential programs, dispose of feces in a sanitary manner.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of HAV to a case's sexual partners as well as being a way to prevent exposure to and transmission of other pathogens.
- Consider vaccination of those at high-risk of contracting hepatitis A. Iowa residents who should be vaccinated include the following:

- Persons ($\geq$ 12 months of age) traveling to or working in countries with high or intermediate rates of hepatitis A, such as Central or South America, the Caribbean, Mexico, Asia (except Japan), Africa, and southern or eastern Europe. The second dose should be given 6 months or later after the first.
- Men who have sex with men.
- Illegal drug users, whether injecting or not.
- Persons with chronic liver disease (not just infection), including those who are awaiting or have received liver transplants.
- Persons who receive clotting factor concentrates.
- Persons who have occupational risk for infection; specifically, those who work with HAV-infected primates or with HAV in a research laboratory setting. Sewage workers do not need to be vaccinated.

International Travel

Travelers to areas where hepatitis A is endemic should receive hepatitis A vaccine before travel. The first dose of hepatitis A vaccine should be administered as soon as travel is considered. One dose of single-antigen hepatitis A vaccine administered at any time before departure may provide adequate protection for most healthy individuals. For optimal protection, older adults, immunocompromised persons, and persons with chronic liver disease or other chronic medical conditions who are traveling to an area where risk of transmission is high less than two weeks after the initial dose, may also be administered IG, but at a different anatomic injection site. Completion of the vaccine series according to the licensed schedule is necessary for long-term protection. However, contraindications to the vaccine may preclude individuals from receiving it. If an individual is allergic to a component of the vaccine or is <12 months old (vaccine is not licensed for this age group), that individual should not receive the vaccine. In addition, travelers should pay attention to what they eat and drink. This step is extremely important because the vaccine is not 100% effective and immunity conferred from IG wears off over time (3-6 months). Taking precautions such as those listed below will help prevent other illnesses as well, including travelers' diarrhea, cholera, dysentery, and typhoid fever.

Recommendations to travelers include the following.

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than non-carbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water.
- Avoid Popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel your own raw fruits or vegetables and do not eat the peelings.
- Avoid foods and beverages from street vendors.

For more information regarding international travel and hepatitis A, contact the CDC's Traveler's Health Office at (877) 394-8747 or through the Internet at http://www.cdc.gov/travel .

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hepatitis A can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

REFERENCES

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.

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Heymann, D.L., ed., *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

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FACT SHEET

HEPATITIS A

(viral or infectious hepatitis)

What is hepatitis A?
Hepatitis A is a liver disease caused by hepatitis A virus. In children it may be very mild, but some adults who develop hepatitis A are ill enough to miss about four to six weeks of work.

Who gets hepatitis A?
Anyone can get hepatitis A, however, individuals who travel to countries where hepatitis A is common, intimate and household contacts of infected individuals, men who have sex with men and those who use illegal drugs are at an increased risk of becoming infected.

How soon do symptoms appear?
Time from infection to illness is 15 - 50 days with an average of 28 - 30 days.

How is the virus spread?
The hepatitis A virus is found in the feces (stool) of infected persons. It is usually spread by putting something in your mouth that has been contaminated by the stool of a person infected with hepatitis A. Hepatitis A may be spread by food that has been handled by infected persons who do not wash their hands carefully. Hepatitis A may also be spread by drinking water contaminated with human feces and the sharing of contaminated drug paraphernalia.

What are the symptoms of hepatitis A?
Fever, loss of appetite, nausea, vomiting, abdominal pains, and a general feeling of being ill are usually the first symptoms. These symptoms are typically followed in a few days by dark ("tea-colored") urine and jaundice (yellowing of the skin and the whites of the eyes). Infected persons usually feel better after one to two weeks, although they may continue to feel tired for a few more weeks. Infected children under the age of three often do not become ill.

How long can an infected person spread the virus?
An infected person can spread the virus for one to two weeks before symptoms appear and for one week after jaundice occurs. Occasionally infants and children may spread the virus for longer periods of time.

Can a person get hepatitis A again?
After infection with hepatitis A, a person generally will not become infected again. However, there are different kinds of hepatitis infections and infection with hepatitis A will not protect against getting other types of hepatitis.

Is there a vaccine to prevent hepatitis A?
Yes, the vaccine is recommended for all children at age 12-23 months, travelers to areas where disease is common, men who have sex with men, users of injecting and non-injecting illicit drugs, residents of a community experiencing an outbreak of hepatitis A, individuals with chronic liver disease, and individuals with clotting-factor disorders.

What is the treatment for hepatitis A?
Once a person is ill, there are no special medicines that will help. Generally, bed rest is all that is needed. Since hepatitis is an illness of the liver, infected persons should avoid drinking alcohol or taking drugs or medicines (including aspirin and Tylenol) without first asking their doctor.

What can be done after a person comes in contact with a person infected with hepatitis A?
Hepatitis A vaccine or immune globulin are both shots given to help prevent hepatitis A. Hepatitis A is not spread at school, work, or by brief casual visits to the home of an infected person so fellow workers, schoolmates, etc., will not need to get a shot. Hepatitis A vaccine or immune globulin is recommended for all household members and close contacts (including sexual and drug sharing contacts) of a person with hepatitis A. The shot should be given as soon as possible and within 14 days of last contact with someone who has hepatitis A.

How can the spread of hepatitis A be stopped?

The spread of hepatitis A can be stopped by always washing hands thoroughly with soap and warm water after using the toilet or changing diapers. When changing diapers make sure child's hands are washed after the diaper change. Children should be taught to always wash their hands with soap after using the toilet. People with diarrhea, regardless of the cause should not prepare foods for others. **Washing hands before preparing any food is important**.

Hepatitis A

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of Death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: ☐ Blood/serum ☐ Other Result date: / /
Result type: ☐ Preliminary ☐ Final
Test type: ☐ IgM HAV ☐ IgG HAV ☐ Total IgM/IgG HAV
Result: ☐ Positive ☐ Negative ☐ Borderline ☐ Equivocal ☐ Not done
Organism: **Hepatitis A virus**

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: ☐ Blood/serum ☐ Other Result date: / /
Result type: ☐ Preliminary ☐ Final
Test type: ☐ IgM HAV ☐ IgG HAV ☐ Total IgM/IgG HAV
Result: ☐ Positive ☐ Negative ☐ Borderline ☐ Equivocal ☐ Not done
Hepatitis A virus
Organism:

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Result date: / /

Result type: ☐ Preliminary ☐ Final Test type: ☐ IgM HAV ☐ IgG HAV ☐ Total IgM/IgG HAV Result: ☐ Positive ☐ Negative ☐ Borderline ☐ Equivocal ☐ Not done

Hepatitis A virus

Organism:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type: ☐ Laboratorian ☐ Nursing ☐ Nurse practitioner ☐ Physician ☐ Physician assistant ☐ Other

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

☐ Yes ☐ No ☐ Unknown
Work in a health care setting
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type: ☐ Laboratorian ☐ Nursing ☐ Nurse practitioner ☐ Physician ☐ Physician assistant ☐ Other

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Admission date: / / Discharge date: / / Days hospitalized:

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Jaundice: ☐ Yes ☐ No ☐ Unk Onset date: / / Date resolved: / /

Dark urine: ☐ Yes ☐ No ☐ Unk Onset date: / / Date resolved: / /

Diarrhea: ☐ Yes ☐ No ☐ Unk Onset date: / / Date resolved: / /

Other symptoms: ☐ Abdominal pain ☐ Anorexia ☐ Fever ☐ Malaise ☐ Nausea

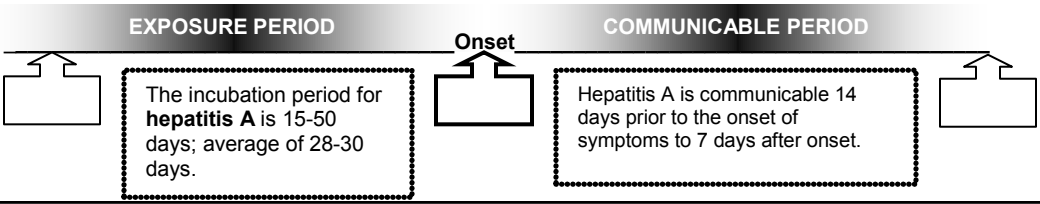
Testing reason: ☐ Elevated liver enzymes ☐ Exposure to risk factor associated with hepatitis A ☐ Symptoms of disease other than elevated liver enzymes ☐ Testing for immunity to hepatitis A

☐ Exposure to someone with confirmed hepatitis A ☐ Screening for blood/plasma donation

ALT performed? ☐ Yes ☐ No ☐ Unk	Result (in IU/l):	Expected min (in IU/l):	Expected max in IU/):
AST performed? ☐ Yes ☐ No ☐ Unk	Result (in IU/l):	Expected min (in IU/l):	Expected max in IU/):

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

In the last30 days have you known someone with jaundice (yellow skin or eyes) ☐ Yes ☐ No ☐ Unknown
If yes Name _____ **Relationship** _____
In the last30 days have you known someone that has been diagnosed with hepatitis A ☐ Yes ☐ No ☐ Unknown
If yes Name _____ **Relationship** _____
Vaccinated for hepatitis A? ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:
Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:

Number of vaccinations: ____

In the 50 days prior to the onset of the symptoms did the case:

Travel within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:	Departure date: / /	Return date: / /
Travel within U.S.? ☐ Yes ☐ No ☐ Unk	State: City:	Departure date: / /	Return date: / /
Travel outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:	Departure date: / /	Return date: / /

Visit restaurants? ☐ Yes ☐ No ☐ Unknown
If Yes, complete the table below:

Establishment name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attend Group Gatherings? ☐ Yes ☐ No ☐ Unknown
If Yes, complete the following table:

Location of gathering	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Dietary Information – *In the 50 days prior to onset of symptoms did the case consume:*

Raw shellfish: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all source/types:	List all brand names:
Unpasteurized Mexican-style cheese: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all source/types:	List all brand names:
Other unpasteurized products: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all source/types:	List all brand

names:

Raw fruits: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw vegetables: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other Exposures – ***In the 50 days prior to the onset of symptoms did the case:***

Wear diapers: ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unknown

Do street drugs or inject steroids: ☐ Yes ☐ No ☐ Unk

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

CONTACTS

Number of people living in case's household: _____ **Close contacts with the case and/or same exposures**? ☐ Yes ☐ No ☐ Unk

Close contacts of case or close contacts with same exposures

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case

☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian ☐ Sexual contact ☐ Family member (non-household) ☐ Significant other ☐ Friend/acquaintance ☐ Work/school/child care ☐ Healthcare provider ☐ Unknown/Other

Documented history of hepatitis A disease? ☐ Yes ☐ No ☐ Unk

Received IG within 14 days of exposure? ☐ Yes ☐ No ☐ Unk

Previously vaccinated for hepatitis A? ☐ Yes ☐ No ☐ Unk

Vaccinated for hepatitis A w/in 14 days of exposure? ☐ Yes ☐ No ☐ Unk

Immune globulin

Contact wt:

Date given: / /

Dose: Unit:

Route:

Hep A vaccine

Date vaccinated: / /

Vaccine manufacturer:

Vaccine type:

Number of vaccinations:

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case

☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian ☐ Sexual contact ☐ Family member (non-household) ☐ Significant other ☐ Friend/acquaintance ☐ Work/school/child care ☐ Healthcare provider ☐ Unknown/Other

Documented history of hepatitis A disease? ☐ Yes ☐ No ☐ Unk

Received IG within 14 days of exposure? ☐ Yes ☐ No ☐ Unk

Previously vaccinated for hepatitis A? ☐ Yes ☐ No ☐ Unk

Vaccinated for hepatitis A w/in 14 days of exposure? ☐ Yes ☐ No ☐ Unk

Immune globulin

Contact wt:

Date given: / /

Dose: Unit:

Route:

Hep A vaccine

Date vaccinated: / /

Vaccine manufacturer:

Vaccine type:

Number of vaccinations:

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case

☐ Spouse	☐ Parent/ guardian	☐ Friend/acquaintance
☐ Child	☐ Sexual contact	☐ Work/school/child care
☐ Sibling	☐ Family member (non-household)	☐ Healthcare provider
☐ Roommate	☐ Significant other	☐ Unknown/Other

Documented history of hepatitis A disease?	☐ Yes ☐ No ☐ Unk	**Immune globulin**	Contact wt:		**Hep A vaccine**	Date vaccinated:	/ /
Received IG within 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Date given: / /			Vaccine manufacturer:	
Previously vaccinated for hepatitis A?	☐ Yes ☐ No ☐ Unk		Dose:	Unit:		Vaccine type:	
Vaccinated for hepatitis A w/in 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Route:			Number of vaccinations:	

NOTES:

FACT SHEET
FOOD HANDLERS

HEPATITIS A
(infectious hepatitis)

What is hepatitis A?
Hepatitis A is a virus that causes liver disease. In children it may be very mild, but some adults who develop hepatitis A are ill enough to miss about 4 to 6 weeks of work.

Who gets hepatitis A?
Anyone can get hepatitis A, but it occurs more often in children.

What are the symptoms of hepatitis A?
Fever, loss of appetite, nausea, vomiting, tiredness, occasionally frequent loose stools, and a general feeling of being ill are usually the first symptoms. These symptoms may be followed in a few days by dark ("tea-colored") urine and jaundice (yellowing of the skin and the whites of the eyes). Infected persons usually feel better after 1-2 weeks. They may continue to feel tired for a few more weeks.

How soon do symptoms appear?
The first symptoms usually appear after about 1 month after infection, but can develop anytime between 2 to 6 weeks after infection.

How is the virus spread?
The hepatitis A virus is found in the feces (stool) of infected persons. For transmission or spread to occur, the hepatitis A virus must enter the mouth of a susceptible individual. Foods may be contaminated when infected food handlers do not wash their hands carefully and directly touch foods that are eaten uncooked or food after it has been cooked.

How long can an infected person spread the virus?
An infected person can spread the virus for 1-2 weeks before symptoms appear and for 1 week after symptom onset occurs.

Can a person get hepatitis A again?
After one infection with hepatitis A, a person cannot get it again. However, there are different kinds of hepatitis; infection with hepatitis A will not protect against getting other types of hepatitis.

What is the treatment for hepatitis A?
Once a person is ill, there are no special medicines that will help. Generally, bed rest is all that is needed. Hepatitis is an illness of the liver. Infected persons should avoid drinking alcohol or taking drugs or medicines (including aspirin and Tylenol) without first asking their doctor.

What can be done after a person comes in contact with a person infected with hepatitis A?
Post exposure prophylaxis can be give within 14 days of the last exposure to reduce the risk of coming down with disease. This is a "shot" given to help prevent hepatitis A. Co-workers of food handlers infected with hepatitis A are advised to get the shot as soon as possible, but at least within 14 days after contact with someone with disease. This shot is also recommended for all household members and close (including sexual and drug sharing) contacts of a person with hepatitis A. This shot must be given within 14 days. It is important to note that the shot does not guarantee that hepatitis A will not occur, however it may lower the risk of serious illness.

Is there a vaccine to prevent hepatitis A?
The hepatitis A vaccine was licensed in the U.S. in June 1995. It is recommended for all children at age 12-23 months, travelers to areas where disease is more common, military personnel, certain ethnic and geographic populations, people living in, or relocating to areas of where hepatitis A is common, persons engaging in high-risk sexual activity (such as men who have sex with men), users of illicit injectable drugs, and residents of a community experiencing an outbreak of hepatitis A.

How can the spread of hepatitis A be stopped?

The spread of hepatitis A can be stopped by always washing hands thoroughly with soap and warm water after using the toilet. It is extremely important that food handler employees not handle food or drinks when they feel ill. Employees should notify their local county health department if they develop signs or symptoms similar to those of hepatitis A.

FOOD HANDLER SUSPECTED OF HAVING HEPATITIS WORKSHEET

Investigator working situation _____ Date Reported _____
Name of food establishment _____
Address _____City _____

Persons to notify (date/time when notified)
CADE Epidemiologist _____ Local PHN _____
County Board of Health _____ DPS _____
Sanitarian _____

ILLNESS
Patient Name _____ Age ____ Sex __ Race _____
Date of Onset of Symptoms _____**Physician**
_____
Hospitalized? Yes __ No __ Name of Hospital _____

Symptoms	Yes	No	
Fever	___	___	Date fever began _____
Fatigue	___	___	Date fatigue began _____
Nausea/Vomiting	___	___	Date nausea/vomiting began _____
Dark Urine	___	___	Date dark urine began _____
Jaundice	___	___	Date jaundice began _____
Diarrhea	___	___	Date diarrhea began _____

Has person received hepatitis A vaccine previously Yes No
If yes dates received dose 1 _____- _____- _____ dose 2 _____- _____- _____

Known or suspected source/risk factors (e.g., contact to confirmed case, drug user) _____
_____

Known or suspected other disease possibly causing symptoms (e.g., cirrhosis, gall bladder disease)
_____

LAB RESULTS

Laboratory:

Telephone No.:

Date Blood Drawn:

	Positive	Negative	Not Done	Liver Enzymes
Total HAV (IgG/IgM)				AST (SGPT)
HAV-IgM				ALT (SGOT)
				Total Bilirubin
HBsAg				
Anti-HBsAg				
HCV anti				

WORK HISTORY

Has the employee handled high-risk foods in the past 2 weeks? Yes __ No __
List Foods
_____
_____
_____
Did the food establishment serve the same people multiple times during the infectious period of the employee? (Ex. Business cafeteria where people may eat many times a week.) Yes __ No __
Describe_____
_____
_____

Food handling practices (use of gloves, ice scooper, mix with hands, etc.)
_____
_____

Are foods held over to the next day? ___ If yes, which foods? _____
_____

Date(s) of sanitarian inspection _____ Name of sanitarian_____

Were soap, toilet paper and paper towels available when the sanitarian inspected? Yes __ No __
Dates worked and job responsibilities during the last 2 weeks:

Date	Shifts/Hours Worked	Did Not Work (X)	Describe Specific Duties and Type of Food Handled
Today			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

List all other dates and shifts worked during infectious period (2 weeks prior to onset to 1 week after onset)

_____

_____

Dates and duties verified by employer? Yes __ No __ By employee? Yes __ No __

HYGIENE

Does patient give history of hand washing after each trip to bathroom? Yes __ No __

Did patient give accurate information regarding hand washing facilities (soap--liquid vs. bar, color, availability of towels, etc.)? _____

Employer's or colleague's impression of hygiene _____

Local Health Department's impression of hygiene (appearance and history) Adequate __ Inadequate __

_____ Post exposure prophylaxis given to other food handlers by private resources (# persons)

_____ Public announcement for patrons (date announcement made _____)

Dates and food involved _____

_____

Average number of customers served each day _____

Number of persons given post exposure prophylaxis at LHD _____

Dates and hours of post exposure prophylaxis clinics

_____

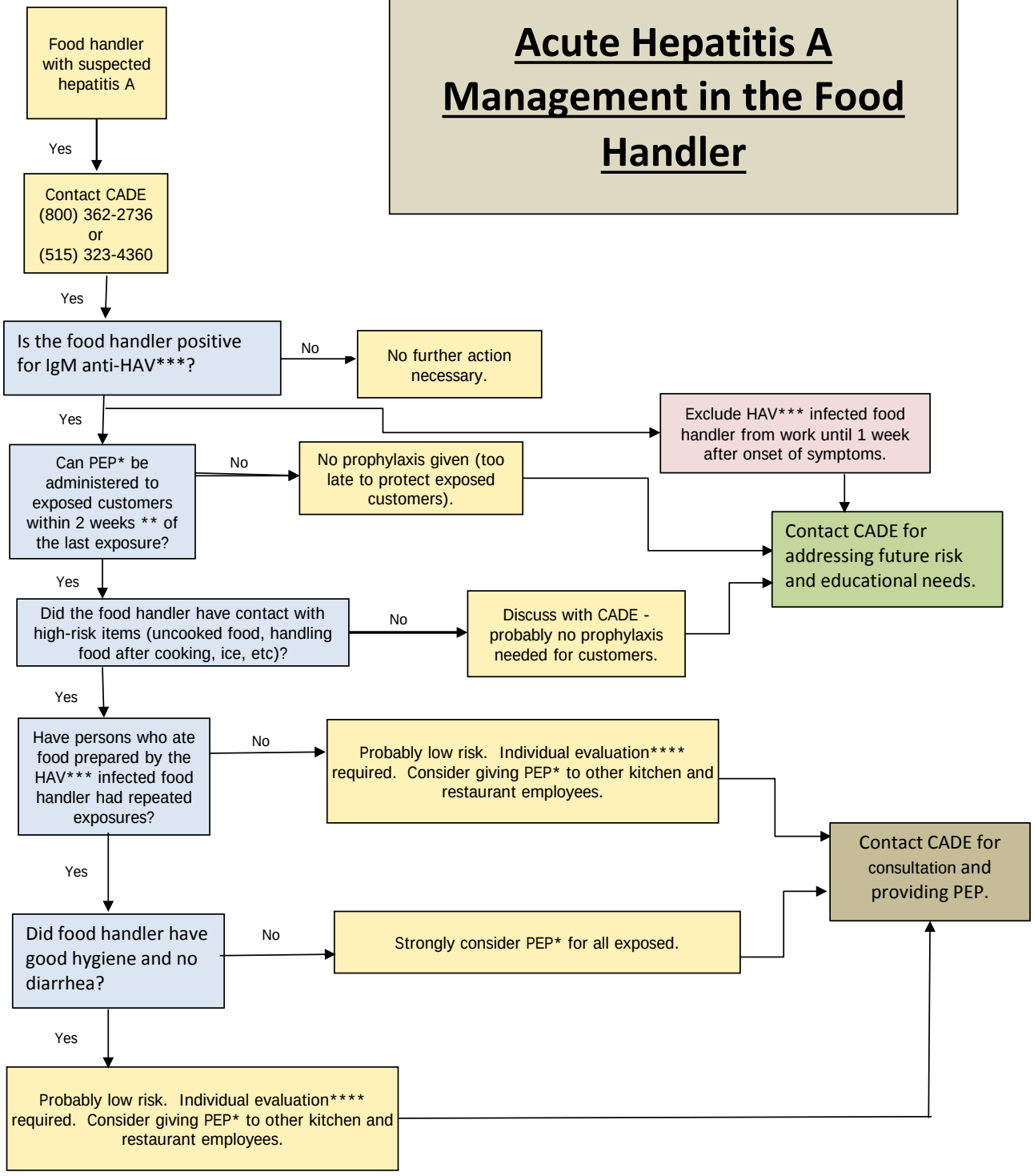
Estimated number of LHD person-hours for follow-up _____

SIX-WEEK FOLLOW-UP

Number of secondary cases which occurred that were likely due to this food establishment _____

Name of Investigator _____ Date investigation completed _____

Acute Hepatitis A Management in the Food Handler



*PEP = Post-exposure prophylaxises (Hepatitis A vaccine for persons age 1 year through age 40 years; for those age <1 year or over age 40 years, pregnant, or have other medical contraindications use immune globulin -IG-dose 0.02 ml/kg of body weight)
**Communicable period = 2 weeks prior to 1 week after the onset of symptoms
***HAV = Hepatitis A virus
****Individual evaluation includes: exact work schedule, dates, times, specific food handler duties for each shift during communicable period

FACT SHEET HEPATITIS A

CHILD CARE CENTER ADMINISTRATORS

What is Hepatitis A?
Hepatitis A, formerly known as "infectious hepatitis," is an infection of a person's liver that is caused by a virus. Approximately 20,000 cases of hepatitis A are reported each year in the United States. In various communities, 15-40% of reported hepatitis A cases are associated with spread within child care centers.

What are the symptoms of Hepatitis A?
The illness usually produces a sudden fever, nausea, vomiting, a general tired or weak feeling, dark-colored urine and jaundice (yellowing of the skin and whites of the eyes). These symptoms begin about 2-6 weeks after contact with the virus. School-age children and adults will usually become ill, **but many children less than 3 years of age may have no symptoms**. An adult who develops hepatitis A may be ill long enough to miss about one month of work. Most people recover completely.

How is Hepatitis A spread?
Persons become infected by getting hepatitis A virus into their mouths. The virus is found in the stool (bowel movement or feces) of an infected person for about 2 weeks before becoming ill and for 1 week after symptoms develop. **Infected children who have no symptoms are as able to spread hepatitis A as infected children who are ill.** In child care centers, the virus can spread by direct contact with infected children, during diaper changing, or by playing with stool-contaminated objects (toys, etc.).

How is Hepatitis A diagnosed?
The diagnosis of hepatitis A is made by a doctor based on the person's symptoms and on blood tests. An infected person with no symptoms will still show signs of hepatitis A infection in the person's blood.

What can prevent illness if a person is exposed to Hepatitis A?
Post exposure prophylaxis can be given to reduce the risk of coming down with disease. This is a shot that is given to prevent hepatitis A. It is most effective if given within 2 weeks after contact with a person who has hepatitis A.

What should be done when a child care center has Hepatitis A?
Since fewer than one in ten infected diaper-aged children have symptoms, outbreaks in child care centers commonly are not recognized until workers and parents begin getting ill. If hepatitis is found in a child care center, the center should not close and parents should be discouraged from transferring their children to other centers. Transferring children only serves to spread the illness to other centers.

How can Hepatitis A be prevented?
Increasing good hygiene practices in staff, parents and children can successfully stop the spread of hepatitis. Prevention measures include the following:

1. Wash hands carefully with soap, warm water, and friction for at least 15 seconds after changing any diapers or handling stool-soiled material from any persons.
2. Wash hands carefully with soap, warm water, and rubbing together for at least 15 seconds after each bowel movement.
3. Make soap easily accessible to all employees and children.
4. Ensure that all children wash hands with warm running water and soap and dry hands with disposable towels after each trip to the bathroom.
5. Dispose of soiled paper diapers and place stool-soiled cloth diapers in a bag that seals tightly for return to parent.

6. Change diapers on a changing table with an impermeable surface. Clean the changing table with an appropriate solution (a 1:100 dilution, or one-quarter cup of bleach per gallon of water, prepared daily and dispensed in a spray bottle). Spray the surface with this solution after each diaper change and wipe with a disposable towel. Diapering should not take place on any play tables or tables on which food is prepared or children eat.
7. Separate food preparation and feeding duties strictly from diaper-changing and toilet cleaning responsibilities.
8. Wash toys at least daily with a bleach solution.
9. Wash any stool-soiled items (floor, beds, toys, etc.) immediately.
10. Disinfect accessory items (such as containers of baby powder or jars of Vaseline) daily as they can accidentally be soiled during a diaper-change.
11. Ensure all children wash their hands with warm running water and soap before meals or snacks.
12. **Wash hands carefully before preparing or handling any food. This step is especially important.**

IF YOU BECOME AWARE OF A POSSIBLE CASE OF HEPATITIS IN A CHILD, FAMILY MEMBER, OR WORKER IN THE CHILD CARE CENTER, YOU SHOULD IMMEDIATELY NOTIFY THE _____ LOCAL HEALTH DEPARTMENT AT PHONE _____

FACT SHEET
CHILD CARE

HEPATITIS A

What is Hepatitis A?
Hepatitis A, formerly known as infectious hepatitis, is an infection of a person's liver, which is caused by a virus. Approximately 20,000 cases of hepatitis A are reported each year in the United States. In various communities, 15% - 40% of reported hepatitis A cases are associated with spread within child care centers.

What are the symptoms of Hepatitis A?
The illness usually produces a sudden fever, nausea, vomiting, a general tired or weak feeling, dark-colored urine and jaundice (yellowing of skin and whites of eyes). These symptoms begin about 2 - 6 weeks after contact with the virus. School-age children and adults will usually become ill, but **many children less than 3 years of age may have no symptoms.** An adult who develops hepatitis A may be ill long enough to miss about one month of work. Most people recover completely.

How do you get Hepatitis A?
Persons become infected by getting hepatitis A virus into their mouths. The virus is found in the stool (bowel movement or feces) of an infected person for about two weeks before becoming ill and for 1-2 weeks after jaundice develops. Infected children who have no symptoms are as able to spread hepatitis A as infected children who are ill. The virus can be spread by direct contact with infected children, during diaper-changing, or by playing with stool-contaminated toys and other objects.

How is Hepatitis A diagnosed?
The diagnosis of hepatitis A is made by a doctor based on the person's symptoms and on blood tests. An infected person with no symptoms will still show signs of the hepatitis A infection in the person's blood.

What can prevent illness if a person is exposed to Hepatitis A?
Post exposure prophylaxis can be given within 14 days of exposure. This is a shot that is given to prevent hepatitis. This will reduce the risk of coming down with the illness if given within 2 weeks after the last contact with a person who has hepatitis A.

What should be done when a child care center has Hepatitis A?
Since fewer than 1 in 10 infected diaper-aged children have symptoms, outbreaks in child care centers commonly are not recognized until workers and parents begin getting ill. If hepatitis is found in a child care center, the center should not close and parents should be discouraged from transferring their children to other centers. Transferring children only helps spread the disease to other centers.

How can Hepatitis A be prevented?
Increasing good hygiene practices in staff, parents and children can successfully stop the spread of hepatitis. Prevention measures include the following:

- Wash hands carefully with soap, warm water, and friction for at least 15 seconds after changing any diapers or handling stool-soiled material from any persons.
- Wash hands carefully with soap, warm water, and rubbing together for at least 15 seconds after each bowel movement.3. Make soap easily accessible to all employees and children.
- Ensure that all children wash hands with warm running water and soap and dry hands with disposable towels after each trip to the bathroom.
- Dispose of soiled paper diapers and place stool-soiled cloth diapers in plastic bag that seals tightly to return to parent for laundering.
- Change diapers on a changing table with an impermeable surface. Clean the changing table with an appropriate solution (a 1:100 dilution, or one-quarter cup of bleach per gallon of water, prepared daily and dispensed in a spray bottle). Spray the surface with

this solution after each diaper change and wipe with a disposable towel. Diapering should not take place on any play tables or tables on which food is prepared or children eat.

- Separate food preparation and feeding duties strictly from diaper-changing and toilet cleaning responsibilities.
- Wash toys at least daily with a bleach solution.
- Disinfect accessory items (such as containers of baby powder or jars of Vaseline) daily as they can accidentally be soiled during a diaper-change.
- Wash any stool-soiled items (floor, beds, toys, etc.) immediately.
- Ensure all children wash their hands with warm running water and soap before meals or snacks.
- **Wash hands carefully before preparing or handling any food. This step is especially important.**

If you become aware of a possible case of hepatitis in a child, family member, or worker in the child care center, you should immediately notify the
_____ Health Department at ( )_____ _____

CHILD CARE CENTER ASSESSMENT WORKSHEET

I. GENERAL INFORMATION

Name of Center: _____ Date: _____

Address: _____ Director: _____

Phone No: _____ No. Staff Members: _____

Reason for Visit (Outbreak, routine, referral, etc.): _____

Is the Center Licensed? Yes __ No __ DHS Licensing Pending: _____

Days & Hours of Operation: _____ No. of Children Licensed for: _____

No. Children Enrolled: _____ Children's' Age Range: _____ to _____

Drop-in Accepted: Yes __ No __ Approximate Number of Drop-ins Each Week ____

II. ROOMING AND STAFF ARRANGEMENTS

1. Total Number of Classrooms: ____ List age groups in each room and No. enrolled:

Age Group	No. Enrolled
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

2. Are children separated by age group at all times (including early morning, late evening)?
   Yes __ No __ If no:

a. During what time period are children together in the morning? _____

b. What time are they together in the afternoon? _____

c. At what other times are they together? _____

3. Are any children transferred to or from another center on a regular basis? Yes __ No __
   If yes, explain:
   _____
   _____
   _____

4. Do workers ever interchange age group assignments (including breaks, due to illness, etc.)?
   Yes __ No __

III. FOOD HANDLING

1. How many cooks prepare food? _____

2. Who prepares food if the cook is ill? _____

3. Does the cook ever work directly with the children? Yes __ No __
   If yes, with diapered children? Yes __ No __

4. List all routine meals/snacks served at the child care center and approximate time served.

   _____ _____

   _____ _____

   _____ _____

   _____ _____

5. Is food preparation done at the center? Yes __ No __
   If no: Where? _____

6. Was a food service inspection performed in response to this disease report? (If yes, attach copy of report).

   Yes __ Date _____ Name of sanitarian: _____
   No __ If no, explain: _____

IV. HYGIENE/SANITATION ASSESSMENT

The following questions reflect issues that should be assessed by observation during a tour of the center. "Yes" responses reflect optimal standards for prevention of disease transmission. "No" responses indicate a potential risk for transmission to occur.

A. <u>Toilet Facilities</u>

1. Total number of bathrooms in center: ___ Total No. of changing tables: ____

2. Are the following available at each sink in center?
   Soap: Yes __ No __ Paper towels: Yes __ No __

3. Is toilet paper available at each toilet in the center? Yes __ No __

4. Are sinks, soap dispensers, and disposable towels in toddler bathrooms at child level and/or are step stools in place by sink? Yes __ No __

5. Are sinks adjacent to all changing tables and toilets or potty chairs? Yes __ No __

6. Do the sinks produce hot water: Yes __ No __

7. Do the toilets flush properly? Yes __ No __

8. Is a covered trash container available at each sink and changing table?
   Yes __ No __

B. Hygiene Factors

1. Is there an organized pattern for handwashing after toileting and before meals?
   Yes __ No __

2. Are children supervised for handwashing each time they attend the bathroom?
   Yes __ No __

3. Are disposable wipes used for cleaning during diaper changing? Yes __ No __

4. Is there an education program developed and used to promote handwashing among staff and children? Yes __ No __

C. Housekeeping

1. Are the following clean?

	Yes	No		Yes	No
Walls	__	__	Toilets/Potty Chairs	__	__
Walkers	__	__	Cribs	__	__
High Chairs	__	__	Playpens	__	__
Tables	__	__	Toys	__	__
Sinks	__	__	Door Handles	__	__
Floors	__	__	Chairs	__	__

2. Is a labeled, properly working spray bottle of bleach solution (1/4 cup bleach per gallon of water) available at (If other disinfectant is used, please note the specific brand.)

	Yes	No	
Each changing table?	__	__	
Near each eating area?		__	__
In each bathroom?	__	__	

3. Is the bleach solution changed daily? Yes __ No __
   If no, how often? _____

4. Are changing table surfaces of a nonpermeable, washable material in good condition?
   Yes __ No __

5. Are crib mattresses covered with a nonpermeable, washable material in good condition?
   Yes __ No __

6. Are toys washed with bleach solution or disinfectant daily? Yes __ No __
   If no, how often? _____

7. Are cribs, playpens, high chairs and walkers washed with bleach solution or disinfectant daily? Yes __ No __

If no, how often? _____

8. Are all linens washed daily in hot water? Yes __ No __
   If no, how often? _____

9. Is the center mopped or vacuumed daily? Yes __ No __
   If no, how often? _____

10. Are eating tables cleaned with bleach solution prior to serving meals? Yes __ No __
    If no, how often? _____

11. Are bathrooms disinfected daily? Yes __ No __
    If no, how often? _____

D. Other Issues

1. Are children assigned the following items for their own personal use daily?

	Yes	No
Sleeping Cot	__	__
High Chair	__	__
Walker	__	__
Playpen	__	__
Crib	__	__

2. Are children's clothing kept separated (e.g., by individual hangers, baskets, etc.)?
   Yes __ No __

3. Are obviously ill children (diarrhea, vomiting, fever, upper respiratory infections) excluded from the center immediately? Yes __ No __

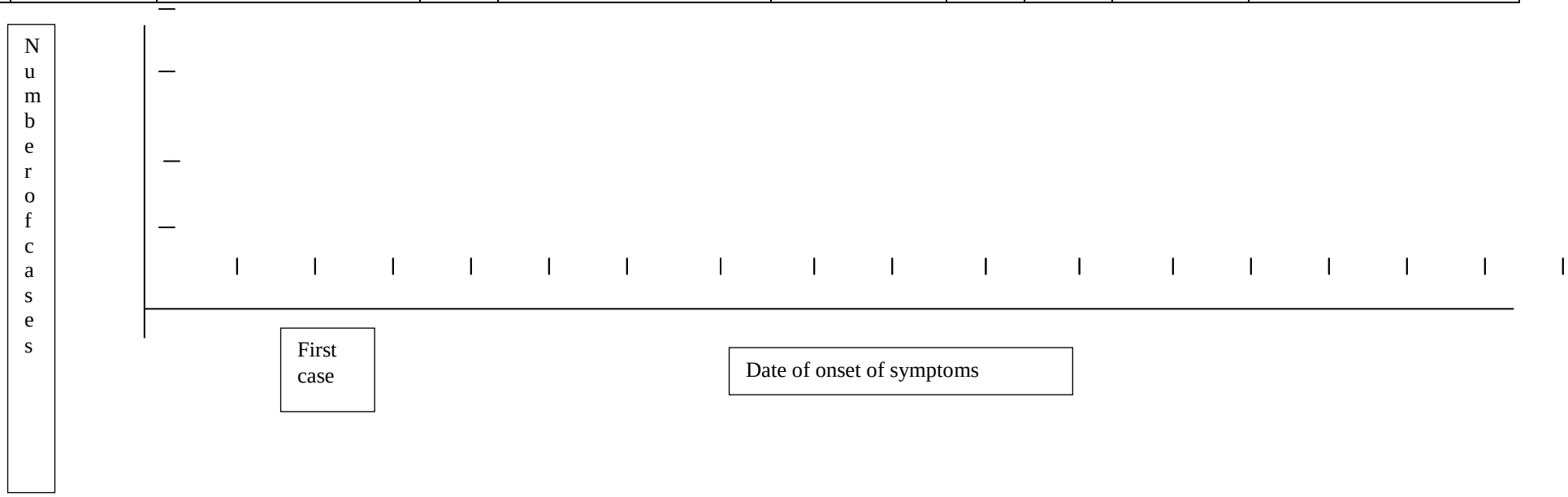
E. Remarks:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Child Care Center: _____ **Case list**

For use by county health department to tabulate data on all confirmed cases of hepatitis associated with the above named child care center (children, employees, and household contacts).

Case Number	Date Case Interviewed	Case name	Age	Name & age of child care center contact(s) or child care center classroom	Date of onset of symptoms	How Case Confirmed Check Box			Other: (for example, food handler, other child care, centers follow-up calls, doctor contact)
						IGM	Liver Tests	Clinical Symptoms	



INDIVIDUAL/PARENTAL CONSENT FOR IMMUNE GLOBULIN

Hepatitis A is a type of viral hepatitis formerly known as infectious hepatitis. The virus is shed in the bowel movement of the infected person. People become infected by getting the hepatitis A virus into their mouth. This can occur through close contact with an infected person (such as household or sexual contact or by handling the diapers of an infected child) or through eating or drinking contaminated food or water.

The virus causes an infection of the liver. The disease most often causes no symptoms in young children; however, in older children and adults, symptoms can range from a mild illness lasting 1-2 weeks to severe nausea, vomiting and jaundice (turning yellow) lasting several weeks.

Immune globulin (formerly called gamma globulin) is a shot that may prevent hepatitis A if it is given within two weeks of exposure to the virus. However, in some cases immune globulin may not prevent hepatitis. Other than local pain from the injection, the side effects from immune globulin are exceedingly rare. The immune globulin shot your child receives may interfere with immunizations for, measles, mumps, rubella, and chickenpox. If your child received one of these immunizations in the two weeks before receiving immune globulin, it should be repeated at a later date. Check with your healthcare provider. Your child should not receive any of the above immunizations for at least 3 months after receiving immune globulin.

****

I am requesting immune globulin be given to _____. I have read the above statements and I have had the opportunity to ask questions. I understand the risks and benefits of immune globulin and I release this child care center, the nurse administering the serum, the local health department, and the Iowa Department of Public Health from responsibility.

_____ _____

Signature - Parent/Guardian/Patient Date

_____ _____

Witness Date

OPTIONS FOR Hepatitis A vaccine or IMMUNE GLOBULIN (IG) ADMINISTRATION FOR CHILD CARE CENTERS

1. Local health department (LHD) staff can give the shots at the child care center either for fixed payment, volunteer donation, or at no charge. **This is the preferred option to ensure compliance.**

2. Parents and children may go to their private physician for the shots.

3. Child care centers can arrange at their expense for a physician to write the prescription for the hepatitis A vaccine or IG and syringes and a clinic can be held at the child care center for administration (clinic staffed by the LHD or by medical professionals associated with the child care center).

4. LHD staff can give the shots at the LHD during certain hours for definite groups of people (either for fixed payment, volunteer donation, or at no charge).

(Options)

THE hepatitis A vaccine or IMMUNE GLOBULIN SHOT CAN BE GIVEN BY YOUR DOCTOR OR AT YOUR HOSPITAL EMERGENCY ROOM. FURTHER QUESTIONS CAN BE ANSWERED BY YOUR DOCTOR OR BY CALLING THE _____ LOCAL HEALTH DEPARTMENT AT (PHONE NUMBER).

OR

For your convenience, the _____ Local Health Department will hold a shot clinic at the child care center from (time) on (day). No person will receive an injection without a signed Informed Consent Form (attached).

Sincerely,

_____
(Name)

_____
(Health Department)

QUESTIONNAIRE TO PARENTS ABOUT HEPATITIS

CHILD CARE CENTER _____

FAMILY NAME: _____

HOME ADDRESS: _____ PHONE: HOME: _____ OFFICE: _____

Please answer the following questions for each person in your household and for <u>close</u> family contacts (e.g., grandparents, aunts, etc.).

IF ANSWER IS YES, PLEASE GIVE DATE OF ONSET.

Name:																		
Age:																		
Occupation:																		
Employer:																		
In the past three months has this person had:	**(Date)**	**Yes**	**No**	**(Date)**	**Yes**	**No**	**(Date)**	**Yes**	**No**	**(Date)**	**Yes**	**No**	**(Date)**	**Yes**	**No**	**(Date)**	**Yes**	**No**
Nausea																		
Vomiting																		
Abdominal Pain																		
Loss of Appetite																		
Diarrhea																		
Dark Urine																		
Yellow Skin or Eyes																		
Has this person been diagnosed as having hepatitis in past 3 months?																		
Has this person received an immune globulin shot for hepatitis in past 3 months? If yes, give date.																		

SAMPLE COVER LETTER TO PARENTS
Accompanying Questionnaire

Dear Parent:

We have recently been notified that within the past _____ weeks that _____ case(s) of hepatitis A (infectious hepatitis) have occurred in persons associated with the _____ Child Care Center.

To accurately assess the current situation at this child care center, the center and the _____ Local Health Department are asking that you complete the accompanying questionnaire. Please fill out the questionnaire completely so that we can determine what, if any, further control measures need to be taken. **Please return the questionnaire to the _____ Child Care Center tomorrow.**

For your information we are including a "Fact Sheet" about hepatitis A that should be helpful in answering questions you may have.

Thank you.

Sincerely,

_____
(Name)

_____
(Local Health Department)

SAMPLE LETTER TO PARENTS-ONE CASE

Dear Parents:

[To be used when child care center does not provide care to diapered children]
Following our recent investigation of _____ Child Care Center, it appears there is only one case of hepatitis A in (child, employee, use appropriate word) the center. To limit the possibility of spread of the disease at the center, we recommend that all previously unvaccinated children and staff in the affected classroom receive hepatitis A vaccine or immune globulin as soon as possible. Currently, we do not recommend hepatitis A vaccine or immune globulin for other children or any household contacts of children at the center. If any members of your household become ill with fever, nausea or vomiting, fatigue, dark urine, or yellow skin or eyes, please call the _____ Local Health Department at (phone number).

[To be used when child care center provides care to diapered children]
Following our recent investigation of _____ Child Care Center, it appears there is one case of hepatitis A in (child, employee, use appropriate word) the center. To limit the possibility of spread of the disease at the center, we recommend that all previously unvaccinated children and staff receive hepatitis A vaccine or immune globulin as soon as possible. If any members of your household become ill with fever, nausea or vomiting, fatigue, dark urine, or yellow skin or eyes, call the _____ Local Health Department at (phone number).

The immune globulin shot your child receives may interfere with immunizations for, measles, mumps, rubella, and chickenpox. If your child received one of these immunizations in the two weeks before receiving immune globulin, it should be repeated at a later date. Your child should not receive any of the above immunizations for at least 3 months after receiving immune globulin. Check with your healthcare provider

(Optional)

For your convenience, the _____ Local Health Department will hold a shot clinic at the child care center from (time) on (day). No person will receive an injection without a signed **Informed Consent Form** (attached).

Sincerely,

_____
(Name)

_____
(Local Health Department)

SAMPLE LETTER TO PARENTS-OUTBREAK

Dear Parents:

We have evidence that there is an outbreak of hepatitis A in _____ Child Care Center. Our evaluation of the cases of hepatitis in this child care center has led public health make several recommendations at this time for the families, children, and staff associated with the center.

Post exposure prophylaxis of either hepatitis A vaccine or Immune globulin (IG), which are both shots, give protection against hepatitis A disease if given before exposure to the virus or within the first two weeks after the last exposure. IG is protective for approximately 2-3 months.

1. **WE RECOMMEND THAT POST EXPOSURE PROPHYLAXIS BE GIVEN AS SOON AS POSSIBLE TO:**

    a. All children who attend _____ Child Care Center (unless the child has ever had hepatitis A infection, hepatitis A vaccine, or has had immune globulin in the past month).

    b. All parents, brothers, sisters and other close contacts of diapered children (unless that person has ever had hepatitis A infection, hepatitis A vaccine, or has had immune globulin in the past month).

    c. Close contacts of non-diapered children who may be at increased risk of developing hepatitis; these should consult their physician regarding the need for post exposure prophylaxis.

2. The immune globulin shot your child receives may interfere with immunizations for measles, mumps, rubella, and chickenpox. If your child received one of these immunizations in the two weeks before receiving immune globulin, it should be repeated at a later date. Your child should not receive any of the above immunizations for at least 3 months after receiving immune globulin. Check with your healthcare provider.

3. Good hygiene is of utmost importance and must be stressed. Strict handwashing and cleanliness can successfully stop transmission of hepatitis A. **PLEASE** read the hygiene recommendations on the **Fact Sheet: Hepatitis A in Child Care**.

4. Please notify _____ Local Health Department at (phone number) if you or any of your family members are diagnosed as having hepatitis A.

5. Please do not remove your child(ren) from this child care center as this can increase the spread of hepatitis by introducing the disease into other centers, nurseries, or homes. Since they may have already been exposed at the current child care, disrupting the child's life by sending them to a new child care is not productive.

SAMPLE LETTER TO ADMINISTRATOR-ONE CASE

Dear Administrator (Or Name):

[To be used when child care center does not provide care to diapered children]
Following our investigation, it appears there is only one case of hepatitis A in a (child, employee, use appropriate word) of _____ Child Care Center. To limit the possibility of spread of the disease at the center, we recommend that children and employees in the (e.g. two-year old, toddler, etc.) classroom receive hepatitis A vaccine or immune globulin as soon as possible. Currently we do NOT recommend post exposure prophylaxis for other children and employees in the center or household contacts of any of the children. Please notify _____ Local Health Department of any further cases in child care employees, children, or household contacts of children, as our recommendations would then be revised.

[To be used when child care center provides care to diapered children]
Following our investigation of _____ Child Care Center, it appears there is one case of hepatitis A in (child, employee – use appropriate word) the center. To limit the possibility of spread of the disease at the center, we recommend that all previously unvaccinated children and staff receive hepatitis A vaccine or immune globulin as soon as possible. If any members of your household become ill with fever, nausea or vomiting, fatigue, dark urine, or yellow skin or eyes call the Local Health Department at (insert phone number).

(**Optional**)

For your convenience, the _____ Local Health Department will hold a shot clinic at the child care center from (time) on (day). No person will receive an injection without a signed Consent Form.

Sincerely,

_____
(Name)

_____
(Local Health Department)

SAMPLE LETTER TO ADMINISTRATOR-OUTBREAK

Dear Administrator (Or Name):

Following our investigation of the occurrence of hepatitis A in _____ Child Care Center, we have evidence that hepatitis A has been spread within the center. To prevent further transmission of hepatitis A within your center, we are making the following recommendations:

1. The center should not accept new admissions or drop-ins for 6 weeks following the diagnosis of the last associated case of hepatitis A. Alternatively, you can:

    a. require that all new enrollees have proof of an injection with hepatitis A vaccine or immune globulin prior to admission (the IG will protect them for 2 - 3 months, a completed hepatitis A vaccine series for many years), or

    b. separate any new enrollees or drop-ins from the current group of children and use a staff member who would not work with any of the current group of children. We strongly discourage entirely closing the center (even temporarily) as this would merely spread the illness to other centers.

2. Hepatitis A vaccine or immune globulin are shots which can be given to prevent the disease if it is given before exposure to the virus or within the first 2 weeks after last exposure. Both will decrease the risk of coming down with disease. **IT WILL NOT PREVENT THE DISEASE IF GIVEN JUST BEFORE THE ONSET OF SYMPTOMS.** Hepatitis A vaccine or immune globulin is strongly recommended to be given as soon as possible to:

    a. All current staff who have no past history of hepatitis A infection or receiving hepatitis A vaccine and who have not received immune globulin in the past month.

    b. All children in the center who have no past history of hepatitis A infection or hepatitis A vaccine, and who have not received immune globulin in the past month.

    c. Close family contacts (parents, brothers and sisters, etc.) of all diapered children enrolled, if the contact has no past history of hepatitis A infection or hepatitis A vaccine, or has not received immune globulin in the past month.

    d. Any <u>new</u> staff employed in the child care center in the period extending from now to six weeks after the last case of hepatitis A associated with this outbreak occurs.

Administration of live virus vaccine (e.g. measles, mumps, rubella, chickenpox) should be delayed for at least 3 months, following receipt of immune globulin.

In light of the fact that immune globulin is only effective for 2-3 months, if effective control measures are not implemented and this outbreak extends for two or more months, it may be necessary to repeat the administration of immune globulin to persons at a later date.

It will be your responsibility to call the local health department each Friday to report any newly recognized cases.

Once six weeks have elapsed since the last diagnosed case, all restrictions will be lifted. It should be emphasized that unless these recommendations are complied with, your center is likely to see cases of hepatitis A for some time.

If we can be of assistance at any time please contact us.

(**Optional**)

For your convenience, the _____ Local Health Department will hold a shot clinic at your center from (time) on (day).

Sincerely,

_____
(Name)

_____
(Local Health Department)

SAMPLE RELEASE LETTER TO ADMINISTRATOR

Dear Administrator:

We have had no reported cases of hepatitis A associated with _____ Child Care Center in the last six weeks. We feel the outbreak of hepatitis is resolved. Therefore, the restrictions on _____ Child Care Center are officially lifted and you may resume your normal admission procedures. Please continue to maintain hygiene recommendations and resume enforcement of the immunization law.

Thank you for your cooperation.

Sincerely,

_____
(Name)

_____
(Local Health Department)

SAMPLE LETTER TO PARENTS TO COMPLETE HEPATITIS INVESTIGATION

Dear Parent:

It has been six weeks since a case of hepatitis A associated with _____ Child Care Center has been reported to us. If any family members or other close contacts of your child have been diagnosed as having hepatitis or had a hepatitis-like illness (nausea, vomiting, lack of appetite, fatigue, abdominal pain, yellow skin or eyes) in the past six weeks, please call _____ Local Health Department at (phone) as soon as possible. Thank you for your cooperation.

Sincerely,

_____
(Name)

_____
(Local Health Department)

Tabulation Sheet

Child Care Center _____ Date of Questionnaire _____

List names and other information requested below on each person identified by the parents' questionnaire survey who has YELLOW SKIN OR EYES OR DARK URINE **AND** ANY TWO OF THE OTHER SYMPTOMS LISTED ON THE QUESTIONNAIRE.

Contact each person by phone and complete the information on the Viral Hepatitis Case Report Form. Recommend medical confirmation if diagnosis is probable.

If case is confirmed, place the name of the case on the Case List.

Key, N= Nausea, V= Vomiting, AP = Abdominal Pain, LOA = Loss of Appetite, D = Diarrhea, DU = Dark Urine, Y = Yellow skin or eyes

Name of Person with symptoms & Relationship to child care center child	Name and age of child care center contact	Phone: Home: Work:	Symptoms (use key)	Date Contacted	Doctor's name and phone	Probable Case Yes	Probable Case No	Confirmed Case Yes	Confirmed Case No

HEPATITIS B

Also known as: Serum hepatitis, Australian antigen hepatitis, epidemic jaundice

Responsibilities:
Hospital: Report by IDSS, facsimile, phone, or mail
Lab: Report by IDSS, facsimile, phone, or mail
Physician: Report by facsimile, phone, or mail
Local Public Health Agency (LPHA): Follow-up is required. Report by IDSS, facsimile, phone, or mail

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Hepatitis B virus (HBV) is a small, double-shelled virus in the Hepadnaviridae family. The virus has a small circular DNA genome that is partially double-stranded. HBV contains numerous antigenic components, including HBsAg, hepatitis B core antigen (HBcAg), and hepatitis B e antigen (HBeAg).

B. Clinical Description

Symptoms & Onset – The prodromal phase from initial symptoms to onset of jaundice usually lasts from 3 - 10 days. It is nonspecific and is characterized by insidious onset of malaise, anorexia, nausea, vomiting, right upper quadrant abdominal pain, fever, headache, myalgias, skin rashes, arthralgias and arthritis, and dark urine, beginning 1 to 2 days before the onset of jaundice. The jaundice phase is variable, but usually lasts from 1 - 3 weeks, characterized by jaundice, light or gray stools, hepatic tenderness and hepatomegaly (splenomegaly is less common). During convalescence, malaise and fatigue may persist for weeks or months, while jaundice, anorexia, and other symptoms disappear. Less than 10% of children and approximately 30% of adults will experience jaundice.

Complications – Fulminant hepatitis occurs in about 1% - 2% of persons, with mortality rates of 63% - 93%. About 200 - 300 Americans die of fulminant disease each year. Although the consequences of acute HBV infection can be severe, most of the serious complications associated with HBV infection are due to chronic infection. Those that are chronically infected are infected for life and can pass the virus to others, even without symptoms. Approximately 10% of all acute HBV infections progress to chronic infection. As many as 90% of infants who acquire HBV infection from their mothers at birth become chronic carriers. Of children who become infected with HBV between 1 year and 5 years of age, 30% - 50% become chronic carriers. By adulthood, the risk of becoming a chronic carrier is decreased to 6% - 10%. Persons with chronic infection are often asymptomatic and may not be aware that they are infected, yet are capable of infecting others. Chronic infection is responsible for most HBV-related morbidity and mortality, including chronic hepatitis, cirrhosis, liver failure, and hepatocellular carcinoma. Chronic active hepatitis develops in more than 25% of chronic carriers, and often results in cirrhosis. An estimated 3,000 - 4,000 persons die of hepatitis B-related cirrhosis each year in the United States. Persons with chronic HBV infection are at 12 - 300 times higher risk of hepatocellular carcinoma than non-carriers. An estimated 1,000 - 1,500 die each year in the United States of hepatitis B-related liver cancer.

C. Reservoirs

Humans are the only known reservoir.

D. Modes of Transmission

Spread – HBV is transmitted by parenteral or mucosal exposure to HBsAg-positive body fluids from persons who are carriers or have acute HBV infection. The highest concentrations of the virus are in the blood and serous

fluids; lower titers are found in other fluids, such as saliva and semen. Saliva can be a vehicle of transmission through bites; however, other types of exposure to saliva, including kissing, are unlikely modes of transmission. There appears to be no transmission of HBV via tears, sweat, urine, stool, or droplet nuclei.
Person-to-person – In the United States, the most important route of transmission is by sexual contact, either heterosexual or homosexual, with an infected person. Fecal-oral transmission does not appear to occur. However, transmission among homosexual men occurs possibly via contamination from asymptomatic rectal mucosal lesions.

Direct percutaneous inoculation by needles during injection drug use is another mode of HBV transmission. Transmission of HBV may also occur by other percutaneous exposure, including tattooing, ear piercing, and acupuncture, as well as needle-sticks or other injuries from sharp instruments sustained by medical personnel. These encounters account for only a small proportion of reported cases in the United States. Breaks in the skin without overt needle puncture, such as fresh cutaneous scratches, abrasions, burns, or other lesions, may also serve as routes for entry.

Contamination of mucosal surfaces with infective serum or plasma may occur in the laboratory during mouth pipetting, or by eye splashes or other direct contact with mucous membranes of the eyes or mouth, such as hand-to-mouth or hand-to-eye when contaminated with infective blood or serum. Transfer of infective material to skin lesions or mucous membranes via inanimate environmental surfaces may occur by touching surfaces of various types of contaminated hospital equipment. Contamination of mucosal surfaces with infective secretions could also occur with contact of semen.

Perinatal transmission from mother to infant at birth is very efficient. If the mother is positive for both HBsAg and HBeAg, 70% - 90% of infants will become infected in the absence of postexposure prophylaxis. The risk of perinatal transmission is about 20% if the mother is positive only for HBsAg; up to 90% of these infected infants will become HBV carriers. An estimated 15% - 25% of these carriers will ultimately die at an early age of liver failure secondary to chronic active hepatitis, cirrhosis, or primary hepatocellular carcinoma.

E. Incubation period

The incubation period of HBV infection is an average of 60 - 90 days, with a range of 45 - 180 days.

F. Period of Communicability or Infectious Period

Persons with either acute or chronic HBV infection should be considered infectious any time that HBsAg is present in the blood. When symptoms are present in persons with acute HBV infection, HBsAg can be found in the blood and body fluids of infected persons for several weeks before and days, weeks, or months after the onset of symptoms. Persons who have chronic hepatitis B (known as carriers) will be positive for HBsAg and remain infectious indefinitely.

G. Epidemiology

The frequency of infection and patterns of transmission vary in different parts of the world. Approximately 45% of the global population live in areas with a high prevalence of chronic HBV infection ($\geq$8% of the population is HBsAg-positive); 43% in areas with a moderate prevalence (2% to 7% of the population is HBsAg-positive); and 12% in areas with a low prevalence (<2% of the population is HBsAg-positive).

In China, Southeast Asia, most of Africa, most Pacific Islands, parts of the Middle East, and the Amazon Basin, 8% to l5% of the population carry the virus. The lifetime risk of HBV infection is greater than 60%, and most infections are acquired at birth or during early childhood, when the risk of developing chronic infections is greatest. In these areas, because most infections are asymptomatic, very little acute disease related to HBV occurs, but rates of chronic liver disease and liver cancer among adults are very high. In the United States, Western Europe, and Australia, HBV infection is a disease of low endemicity. Infection occurs primarily during adulthood, and only 0.1% to 0.5% of the population is chronically infected. Lifetime risk of HBV infection is less than 20% in low prevalence areas.

The incidence of reported hepatitis B in the U.S. peaked in the mid-1980s with about 26,000 cases reported each year. Reported cases have declined since that time and fell below 10,000 cases for the first time in 1996. In

1999, a provisional total of 6,495 cases were reported. The decline in cases during the 1980s and early 1990s is generally attributed to reduction of transmission among homosexual men and injection drug users as a result of HIV prevention.
Reported cases of HBV infection represent only a fraction of cases that actually occur. In 2009, a total of 3,374 cases of acute hepatitis B were reported to CDC, resulting from an estimated 38,000 new infections. Because many HBV infections are either asymptomatic or never reported, the actual number of new infections is estimated to be approximately tenfold higher. An estimated 800,000 to 1.4 million persons in the United States are chronically infected with HBV and an additional 5,000 – 8,000 persons become chronically infected each year.

H. Bioterrorism Potential

None

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

1. To identify sources/sites of transmission and to prevent spread from such sources.
2. To ensure identification of infected pregnant women and prevent perinatal transmission.

The following table contains selected hepatitis B serologic markers (what's looked for in blood samples) and their definitions. These results help determine which phase of infection, resolution or immunity a person is in. These are results relevant to the reporting requirements.

Interpretation of the Hepatitis B Panel		
Tests	**Results**	**Interpretation**
HBsAg anti-HBc anti-HBs	negative negative negative	Susceptible
HBsAg anti-HBc anti-HBs	negative positive positive	Immune due to natural infection
HBsAg anti-HBc anti-HBs	negative negative positive	Immune due to hepatitis B vaccination**
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	Acutely infected
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	Chronically infected
HBsAg anti-HBc anti-HBs	negative positive negative	Four interpretations possible *

* Four Interpretations:

1. Might be recovering from acute HBV infection.
2. Might be distantly immune and test not sensitive enough to detect very low level of anti-HBs in serum.
3. Might be susceptible with a false positive anti-HBc.
4. Might be undetectable level of HBsAg present in the serum and the person is actually chronically infected.

** Antibody response (anti-HBs) can be measured quantitatively or qualitatively. A protective antibody response is reported quantitatively as 10 or more milliinternational units (>=10mIU/mL) or qualitatively as positive. Post-vaccination testing should be completed 1-2 months after the third vaccine dose for results to be meaningful.

Definitions

- **Hepatitis B Surface Antigen (HBsAg):** Present in acute and chronic cases and persists in chronic carriers. The presence of HBsAg indicates that the person is infectious. The body normally produces antibodies to HBsAg as part of the normal immune response to infection.
- **Hepatitis B Surface Antibody (anti-HBs):** The presence of anti-HBs is generally interpreted as indicating recovery and immunity from HBV infection. Anti-HBs also develop in a person who has been successfully vaccinated against hepatitis B.
- **Total Hepatitis B Core Antibody (anti-HBc):** Appears at the onset of symptoms in acute hepatitis B and persists for life. The presence of anti-HBc indicates previous or ongoing infection with hepatitis B virus (HBV) in an undefined time frame.
- **IgM Antibody to Hepatitis B Core Antigen (IgM anti-HBc):** This antibody appears during acute or recent HBV infection and is present for about 6 months. This is the best test to diagnose acute hepatitis B.

Additional Tests

- **Hepatitis B e antigen (HBeAg):** This marker is used to identify persons infected with hepatitis B who are at increased risk for transmitting HBV. E antigen is seen transiently in most infections and persists indefinitely in some carriers.
- **Hepatitis B DNA:** May be ordered by a physician to determine the viral load in a patient. The test indicates infection with hepatitis B but does not distinguish between acute and chronic infection.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Note: Healthcare providers, hospitals and laboratories are reminded to report all cases of HBsAg-positive pregnant women.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

1. **Confirm the diagnosis.** Contact the patient's health care provider to verify the test result and interpretation. Also verify that the patient has been informed of his or her diagnosis. If a provider cannot be reached within 72 hours of the initial attempt to contact the provider, proceed with the investigation. Be

sure to inform the patient that you were unable to contact his/her provider and that additional follow-up with that provider may be needed to confirm the diagnosis and/or discuss treatment options.

a. See the "Interpretation of the Hepatitis Panel" above for test result interpretation.
b. Acute cases of hepatitis B must have symptoms of hepatitis B to be counted as an acute case according to CDC case definitions (see Additional Information). If symptoms are not present then the case should still be investigated and reported to CADE.
c. Symptomatic reported cases without profile results may be considered confirmed cases when found to be epidemiologically related to an HBsAg-positive case within the previous 6 months of their onset (e.g., jaundiced IV drug user who relates sharing a needle with a case reported 3 months ago).

2. Complete a Hepatitis B case investigation (in IDSS) for all suspected or confirmed cases of hepatitis B.
3. Make appropriate recommendations for prevention of transmission and identify contacts at risk. Efforts should be made to locate contacts and inform them of their exposure, making certain to maintain client confidentiality. Locating contacts who are at high risk of infection or who may have significant consequences (e.g., a sexual contact that is pregnant) is especially important. Language-specific materials can be found at www.cdc.gov/hepatitis/Resources/PatientEdMaterials.htm
4. Make necessary interventions to stop transmission to others (e.g., blood banks must be notified if the case donated or received blood or blood products within the past 6 months, physicians of pregnant clients should be contacted to ensure proper follow-up of the newborn, etc.). If it appears that an outbreak may be occurring (i.e., two or more current cases with suspected common source), contact the Center for Acute Disease Epidemiology (CADE) at 800-362-2736.
5. Many risk factors are common to hepatitis B and HIV, therefore clients who may also be at risk of HIV infection (e.g., IV drug users), should be tested for HIV. A list of current confidential HIV test sites is available through the HIV/AIDS/Hepatitis Program at (515) 281-6801 or www.idph.state.ia.us/HivStdHep/HIV-AIDS.aspx?prog=Hiv&pg=HivPrev

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

There are no isolation restrictions or quarantine requirements for patients with HBV, except for exclusion from organ and blood donation. Patients should also be provided with counseling to modify activities to prevent further transmission.

B. Protection of Contacts of a Case

Immunization of contacts**:** Products available for postexposure prophylaxis include hepatitis B immune globulin (HBIG) and hepatitis B vaccine.

1. **Infants born to HBsAg-positive mothers** should be treated as follows:
   a. Give HBIG (0.5 ml IM) and hepatitis B vaccine (0.5ml IM) according to the following table.

Immunoprophylaxis of Infants Born to HBsAg-positive Mothers

Vaccine/HBIG Dose	**Age**
First hepatitis B vaccine	Birth (within 12 hours)
HBIG[1]	Birth (within 12 hours)
Second hepatitis B vaccine	1–2 months
Third hepatitis B vaccine	6 months

[1] Give HBIG (0.5ml IM) simultaneously with, but at a different site from, the first dose of hepatitis B vaccine.

b. Screen the infant for HBsAg and anti-HBs 1 to 2 months and after the third dose of hepatitis B vaccine, when the child is at least 9 to 15 months of age, to monitor the success or failure of the immunization. If HBsAg is not present and anti-HBs antibody is present, children can be considered protected.
c. Infants who do not respond to the initial vaccine series (anti-HBs-negative) and are not HBsAg-positive should be given a second 3-dose series of hepatitis B vaccine (same schedule as initial series) and be re-screened at 1 to 2 months after the last dose.
d. Infants weighing less than 2,000 grams (4.4 lbs) should receive single-antigen hepatitis B vaccine (birth dose) and HBIG within 12 hours of birth, administered at different injection sites.
e. For preterm infant weighing less than 2,000 grams, the initial vaccine dose (birth dose) should not be counted as part of the vaccine series because of the potentially reduced immunogenicity of hepatitis B vaccine in these infants.
f. The second dose of HBV vaccine should be given when the infant is chronologically one month of age regardless of weight. The third dose should be administered one month following the second dose, and the fourth dose should be given six months following the second dose. Thus, a total of four doses of HBV vaccine are recommended in this circumstance.
g. **Infants who become HBsAg-positive** should be referred to a pediatric hepatologist for follow-up and the parents should be counseled. Since HBV infection is a reportable disease, the HBsAg-positive infant should be reported to Iowa Department of Public Health.

2. **Infants born to mothers whose HBsAg status is not known** should be treated as follows:
   a. The hepatitis B vaccine should be given within 12 hours of birth while awaiting HBsAg test results on the mother. If the mother is determined to be positive, the infant should receive HBIG as soon as possible, within 7 days of birth. This child should then complete the 3-dose hepatitis B vaccination series according to the table in Section 3) B. The child should then be screened for HBsAg and anti-HBs at 9 to 15 months of age, as described in Section 3) B above.
   b. If the mother is determined to be **HBsAg-negative**, the infant should complete the 3-dose hepatitis B vaccine series according to ACIP recommendations, as in chart above.
   c. Infants weighing less than 2,000 grams (4.4 lbs) should receive hepatitis B vaccine (birth dose) and HBIG within 12 hours of birth if the mother's status is not determined within that timeframe.

3. **Unvaccinated infants exposed to a primary caretaker with acute hepatitis B** should receive HBIG (0.5 mL) and should initiate and complete the 3-dose hepatitis B vaccine series according to the table above as soon as possible. Infants who have already started the vaccine series **do not** need HBIG, and should complete the vaccination series on schedule.

4. **Sexual contacts of a person with acute hepatitis B,** if susceptible, should receive a single dose of HBIG (0.06 mL/kg), if the HBIG can be given within 14 days of the last sexual exposure. In addition, sexual contacts should initiate and complete a 3-dose series of hepatitis B vaccine according to the table in Section 3) D.

5. **Sexual contacts of persons with chronic hepatitis B,** if susceptible, should initiate and complete the 3-dose series of hepatitis B vaccine according to the table in Section 3) D.

6. **Nonsexual household contacts of a person with acute hepatitis B,** if susceptible, who have had a blood exposure to the index patient (such as sharing toothbrushes or razors) should receive a single dose of HBIG (0.06 mL/kg) and should initiate and complete the 3-dose series of hepatitis B vaccine according to the table in section 3) D. The 3-dose hepatitis B vaccination series should also be considered for contacts who do not have a blood exposure; children and adolescents, especially, should be vaccinated according to the table in Section 3) D.

7. **All household contacts, including infants, of persons with chronic hepatitis B,** if susceptible, should initiate and complete the 3-dose series of hepatitis B vaccine according to the table in Sections 3) D.

8. **Persons with percutaneous or mucous membrane exposures** to either an acute or chronic case, if susceptible, should receive postexposure prophylaxis according to the table below.

Recommended Post-exposure Prophylaxis for Percutaneous or Permucosal Exposure to Hepatitis B Virus

Vaccination status of *Exposed* person	Treatment when *source* is found to be:		
	HBsAg[1]-positive	**HBsAg-negative**	**Unknown or not tested**
Unvaccinated	Administer 1 dose of HBIG[3] and initiate hepatitis B vaccine series	Initiate hepatitis B vaccine series	Initiate hepatitis B vaccine series
Previously vaccinated: Known responder[2]	No treatment	No treatment	No treatment
Previously vaccinated: Known non-responder	2 doses of HBIG, or 1 dose of HBIG **and** initiate revaccination[4]	No treatment	If known high-risk source, treat as if source were HBsAg-positive
Previously vaccinated: Response unknown	Test exposed person for anti-HBs[5] • If adequate, no treatment • If inadequate, 1 dose of HBIG **and** a vaccine booster dose[6]	No treatment	Test exposed person for anti-HBs[5] • If adequate, no treatment • If inadequate, vaccine booster dose[6]

[1] Hepatitis B surface antigen.

[2] Responder is defined as a vaccinated person with adequate levels of serum antibody to HBsAg (*i.e.,* anti HBs > 10 mIU/mL).

[3] Hepatitis B immune globulin; dose 0.06 mL/kg, intramuscularly.

[4] Persons known not to have responded to a 3-dose vaccine series and to revaccination with 3 additional doses should be given 2 doses of HBIG (0.06 ml/kg), one dose as soon as possible after exposure and the second 1 month later.

[5] Adequate serum antibody response to hepatitis B surface antigen is ≥ 10 mIU/mL.

[6] The person should be evaluated for antibody response after the vaccine booster dose. For persons who received HBIG, anti-HBs testing should be done when passively acquired antibody from HBIG is no longer detectable (*e.g.,* 4–6 mo.); if they did not receive HBIG, anti-HBs testing should be done 1–2 months after the vaccine booster dose. If anti-HBs is found to be inadequate (< 10 mIU/mL) after the vaccine booster dose, 2 additional doses should be administered to complete a 3-dose revaccination series.

Table adapted from: American Academy of Pediatrics. *Red Book 2006: Report of the Committee on Infectious Diseases, 27th Edition.* Illinois, American Academy of Pediatrics, 2006:302.

C. Managing Special Situations

1. School and Child care

a. The risk of transmission of HBV in school and child care settings has always been very low. This risk is now even lower because the proportion of susceptible children is decreasing as requirements for hepatitis B immunization for entry into kindergarten have been implemented. To prevent the transmission of hepatitis B and other bloodborne disease in these settings, however, the following guidelines should be followed:

b. **Primary prevention**: Ensure compliance with all hepatitis B immunization requirements. Vaccination is also recommended for unvaccinated classmates of hepatitis B carriers who behave aggressively (*e.g.,* biting) or who have medical conditions, such as open skin lesions (*e.g.,* generalized dermatitis or bleeding problems), that increase the risk of exposing others to infectious blood or serous secretions.

c. **Secondary prevention:** Persons exposed to potentially infectious blood or other body fluids should be treated according to the guidelines for "Postexposure Prophylaxis for Percutaneous or Permucosal Exposure to Hepatitis B Virus" outlined in the table above. However, in the case of a bite by a person whose hepatitis B status is unknown, it is unlikely that it will result in transmission and blood testing is not recommended for either biter or victim. The risk of HBV acquisition when a susceptible child bites an HBV carrier is not known. However, most experts would not give HBIG to the susceptible biting child who does not have oral mucosal disease when the amount of blood transferred is small.

d. **Notification:** Parents may wish to inform the school nurse or child care program director about a child who is a known hepatitis B carrier to allow for proper precautions and assessment of behavior issues that could facilitate transmission. However, this is not necessary since policies and procedures to manage exposure to

blood or blood-containing materials should already be established and implemented. Parents of other children attending the school/child care **do not** need to be informed.

e. **Exclusions:** Adults and children ill with acute hepatitis B should stay home until they feel well, and fever and jaundice are gone. There is no reason to exclude a person with hepatitis B from employment or attendance once they have recovered from acute infection. Admission of a known hepatitis B carrier with specific risk factors, such as biting, open rashes or sores that can't be covered or bleeding problems should be assessed on an individual basis by the child's doctor, school/child care and responsible public health authorities. Because these children pose a risk to others in child care, consideration may be given to exclusion from child care until the aggressive behavior ceases or until all contacts have been vaccinated. However, as the proportion of children who are immunized over time has increased , concern about bites and HBV transmission has also decreased.

f. **Prevention Guidelines:** Whether or not individual hepatitis B carriers have been identified, it is important that school staff receive regular training on the prevention of bloodborne disease. Personnel should be educated about Standard Precautions for handling blood or blood-containing materials. All students should receive age-appropriate instruction regarding the potential dangers of contact with other people's blood and other body fluids. Some Standard Precautions include:

- Follow all procedures for handwashing and cleanliness.
- Always treat all blood as potentially dangerous fluid and observe universal precautions, including using disposable gloves when cleaning or removing blood or body fluid spills.
- Do not permit sharing of personal items that may become contaminated with blood or body fluids, such as toothbrushes, eating utensils, etc.
- Cover open skin lesions.
- Place disposable items contaminated with blood or body fluids in plastic bags in covered containers.
- Store contaminated clothing or washable items separately in plastic bag, and send them home with the owner for proper cleaning.
- Wash and sanitize surfaces of contaminated objects with a dilute solution of 1/4 cup household bleach in 1 gallon of water (1:100 dilution) applied for at least 30 seconds, made up on a daily basis, or disinfect objects by boiling objects for 10 minutes.
- Supervise closely to discourage and prevent aggressive behavior.
- Provide age-appropriate education to adolescents and young adults about prevention of sexually transmitted diseases, including hepatitis B.

D. Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in your city/town is higher than usual, or if an outbreak is suspected, investigate clustered cases in an area or institution to determine source of infection. If evidence indicates a common source, applicable preventive or control measures should be instituted. Consult with an epidemiologist at the Center for Acute Disease Epidemiology at (800) 362-2736 for assistance in investigation and the implementation and recommendation of other control measures.

E. Preventive Measures

General control and prevention measures include implementing all hepatitis B immunization requirements and recommendations, as described below.

1. **Pre-exposure Prophylaxis:** The Iowa Department of Public Health recommends hepatitis B vaccine for the following groups:

   a. **Newborns**

      i. All newborns should receive monovalent hepatitis B vaccine soon after birth and before hospital discharge.

      ii. Following the birth dose, the hepatitis B series should be completed with either monovalent hepatitis B or a combination vaccine containing hepatitis B. The second dose should be administered at 1-2 months of age. The final dose should be administered at 6 months of age. Administering 4 doses of hepatitis B vaccine is permissible (e.g., when combination vaccines are administered after the birth dose).

Routine Schedule for Infant Hepatitis B Vaccination

Dose	Usual Age	Minimum Interval
1	Birth - 2 months	--
2	1–2 months	1 month
3	6 months	2 months[1] and 4 months from 1st dose

[1] Do not administer before 6 months of age

b. **Children and adolescents 18 years or younger**

i. State Immunization Requirements: Hepatitis B vaccine is required for all children who enroll in kindergarten if born on or after July 1, 1994.

c. **Adults over 18 who are at risk**

i. Adults at risk for HBV infection include:
- People who have more than one sex partner in 6 months
- Men who have sex with other men
- Sex contacts of infected people
- People who inject illegal drugs
- People whose jobs expose them to human blood (The Occupational Safety and Health Administration (OSHA) of the US Department of Labor has issued a regulation requiring employers of workers at risk for occupational exposure to HBV to offer HBV immunization to these employees at the employer's expense)
- Household contacts of persons with chronic HBV infection
- Hemodialysis patients

Routine Schedule for Adolescent & Adult Hepatitis B Vaccination

Dose	Usual Interval	Minimum Interval
1	--	--
2	1 month	4 weeks
3	5 months	8 weeks *

***Third dose must be separated from first dose by at least 16 weeks**

ii. Hepatitis B vaccine is produced by 2 manufacturers; both vaccines are available in pediatric and adult formulations.

1. Birth through 19 years (pediatric formulation)
2. Adults (≥ 20 years of age) (adult formulation)

iii. Doses given at less than the minimum intervals should not be counted as part of the vaccination series. Do not restart series, no matter how long since previous dose.

iv. For adults and children with normal immune status, booster doses of vaccine are not recommended, nor are routine serologic testing to assess immune status of vaccinees indicated.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hepatitis B can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

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Resources

www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm

FACT SHEET HEPATITIS B

What is hepatitis B?
Hepatitis B is a virus that enters the bloodstream and then infects the liver. Clinical signs and symptoms occur more often in adults than in infants or children. Approximately 10% of all people infected with hepatitis B will stay infected for a lifetime, however infants and young children infected with hepatitis B have a 90 percent chance of becoming lifelong carriers of the disease. Long-term infection may result in liver disease or cancer.

Who gets hepatitis B?
Anyone can get hepatitis B. However, certain people have a greater chance of becoming infected; these people include babies born to hepatitis-b positive mothers, IV drug users, sexual partners of infected persons, and medical and dental workers.

How is the hepatitis B spread?
Hepatitis B is most often spread from person to person through contact with infected semen, vaginal secretions, or blood. Having sex with an infected person and sharing needles for drug use are two very common ways that people become infected. Babies born to infected mothers and people who live in the house with a "carrier" of hepatitis B are also at risk.

What are the symptoms of Hepatitis B?
Symptoms may be mild or they may be very severe. Symptoms may include extreme tiredness, nausea, vomiting, fever, headache, skin rashes, stomach pain, tea-colored urine, and yellowing of skin and eyes (jaundice). Most people infected with hepatitis B do not develop all symptoms and may never know they are infected.

How soon do the symptoms of Hepatitis B appear?
Loss of appetite and stomach pain commonly appears within 2 to 3 months, but can occur from 6 weeks to 6 months after infection.

How long can an infected person spread the virus?
A person can spread the virus as long as it remains in their blood. Most adults will get rid of the virus within 4 to 6 months; however, about 1 out of every 10 infected adults will become lifelong “carriers”, meaning they will probably never get rid of the virus. Nine out of 10 infected babies will become life-long "carriers". Most hepatitis B carriers have no symptoms of hepatitis, but some will develop serious liver disease years later. Most hepatitis B carriers do not look or feel sick. However, they may eventually develop serious liver diseases such as cirrhosis or liver cancer. Even though carriers may feel healthy, they can still spread the hepatitis B virus to other people.

How is hepatitis B diagnosed?
A blood test is used to detect infection with the hepatitis B virus.

Can a person get hepatitis B again?
If antibodies develop, one infection with the hepatitis B virus protects a person form getting it again. Carriers remain infected for life. However, there are different kinds of hepatitis; infection with hepatitis B will not stop a person from getting other types of hepatitis.

What is the treatment for hepatitis B?
There is no specific treatment for acute HBV infection. People who are sick with hepatitis B should see a doctor for advice about how to control their symptoms. 25-40% of adults with chronic HBV infection and liver disease achieve long-term remission after treatment with interferon-alfa.

What can be done if a person comes into contact with someone infected with hepatitis B?
Hepatitis B immune globulin (HBIG) and hepatitis B vaccine can prevent infection if given within 7 days after an exposure. This treatment is available from doctors in your community. Infants, whose mothers have hepatitis B receive HBIG and begin vaccination at time of birth. Remaining vaccinations should be completed by 6 months of age. Additionally, the baby will have blood tests at 9-12 months to be sure the vaccine has protected them from hepatitis B disease.

How can infection with hepatitis B be prevented?
Never share needles for drug use, ear piercing, tattooing, or any other purpose. Avoid contact with the blood or wound drainage of any other person. Use condoms when having sex.

Is there a vaccine to prevent hepatitis B?
Yes, there is a vaccine to protect against hepatitis B. It is recommended for children, adolescents, and all newborn babies before they leave the hospital (usually within the first 24 hours of birth), and persons who are at high risk for infection or anyone wishing to lower his or her risk of getting hepatitis B. A three dose series will protect the majority of people who are vaccinated.

Information for persons with acute or chronic hepatitis B

What can you do to take care of yourself?
- Avoid alcoholic beverages and street drugs. They will damage your liver.
- Avoid taking prescription or over-the-counter medicines unless your doctor tells you it is OK.
- Eat a healthy diet (low fat) and get enough rest. If you are vomiting after eating tell your doctor.
- See your doctor for a check-up.
- *Persons with acute hepatitis*: Discuss with your doctor about having a blood test (6 months after you first became infected) to see if you have become a carrier of hepatitis B. Carriers may develop serious liver disease in the future and can pass the disease on to others.
- *Women with chronic hepatitis*: Discuss with your doctor about having a blood test every 6-12 months to make sure your liver is healthy and there is not a liver cancer developing. Talk to your doctor about having a special test (called an "ultrasound") done on your liver occasionally.
- If you get pregnant, tell your doctor you have hepatitis B.
- *Women with acute hepatitis:* The baby will need to receive hepatitis B immune globulin and the first dose of the hepatitis B vaccine at birth. The baby will need to complete the vaccine series by 6 months of age and then have post-vaccination testing to assure they are protected.
- *Persons with chronic hepatitis*: It is important that your baby receive hepatitis B immune globulin and the first dose of the hepatitis B vaccine immediately after birth to prevent infection from occurring. The baby will need to complete the vaccine series by 6 months of age and then have post-vaccination testing to assure they are protected.
- Contact the American Liver Foundation for more information (toll-free: 1-800-223-0179).

What can you do to protect others?
- Cover all cuts and sores with a bandage and wash hands well after touching blood or body fluids.
- Throw away any items that have your blood on them, such as bandages and menstrual pads, in plastic bags and close tightly. Wash hands well after touching your blood or body fluids.
- Clean up blood spills with paper towels. Then clean the area with a bleach solution (1 part bleach to 100 parts water, one-quarter cup bleach to a gallon of water).
- Tell your sex partner that you have hepatitis B, use a condom, and encourage your partner to be tested and, vaccinated against hepatitis B.
- Have your sex partners and all those living in your household to see a doctor for testing and for hepatitis B vaccination. Do not allow anyone to come into contact with your blood or body fluids.
- Do not share chewing gum, toothbrushes, razors, scissors, needles for ear piercing, nail files, or anything else that may come in contact with your blood or body fluids.
- Do not share food, drink, cigarettes, lipstick, or lip balm.
- Do not share syringes and needles.
- Do not donate blood, plasma, body organs, sperm, or breast milk.

FACT SHEET HEPATITIS B

Information for Health Professionals

What is Hepatitis B?
The hepatitis B virus (HBV) is a DNA virus and is a major cause of acute and chronic hepatitis, cirrhosis, and liver cancer. Each year in the U.S. alone, there are approximately 78,000 new infections, and there are an estimated 200,000-300,000 million carriers in the world.

How is Hepatitis B transmitted?
Hepatitis B virus (HBV) can be transmitted percutaneously (needlestick), permucosally (blood into eye, sexual intercourse), non-intact skin (blood or secretions into open wounds/cuts/dermatitis, etc.), perinatally, and continuous close contact.
Because HBV is stable on environmental surfaces for at least 7 days, indirect inoculation can occur via inanimate objects (such as toothbrushes and razors). It is not transmitted via the fecal-oral route (as hepatitis A is).

What is the incubation period?
The incubation period is 45-180 days, averaging between 60 and 90 days.

What is the period of communicability?
Hepatitis B surface antigen (HBsAg) can be identified in serum from 30-60 days postexposure and persists for variable periods of time. Approximately 10% of infected adults will become chronic carriers.

How is Hepatitis B diagnosed?
Hepatitis B is diagnosed through two different antigen-antibody responses detected in the blood (HBsAg, anti-HBc IgM).

How is Hepatitis B prevented?
Pre-exposure
- Receive the hepatitis B vaccine.
- Use safe sex practices, always use a condom
- Protect from coming in contact with the blood or other body fluids of others

Post-exposure prophylaxis:
- Hepatitis B vaccine
  Hepatitis B immune globulin (HBIG): Temporary, passive protection

Is a booster dose of Hepatitis B vaccine needed?
If a person has three documented doses of hepatitis B vaccine a booster dose is NOT recommended.

Are extended intervals in vaccination acceptable?
- If a patient has had a dose of vaccine and the interval between that dose and the one they seek now is longer than the recommended timeframe they do not need to re-start the series. Finish the series. If the series is interrupted after the first dose, the second dose should be administered as soon as possible, and the second and third doses should be separated by an interval of at least 8 weeks. If only the third dose has been delayed, it should be administered as soon as possible.

Who should be vaccinated?
Persons who are at risk for exposure to blood, blood products or blood-contaminated fluid should be vaccinated. These include:
- healthcare workers
- clients and staff of institutions for the developmentally disabled
- hemodialysis patients
- sexually active homosexual and bisexual men
- users of illicit injectable drugs
- recipients of certain blood products
- household and sexual contacts of hepatitis B carriers
- inmates of long term correctional facilities
- sexually active heterosexual persons with multiple sexual partners
- babies born to hepatitis B-positive mothers

- international travelers who plan to spend more than 6 months in areas of high endemicity and who will have close contact with the local population.
- all children born on or after July 1, 1994 must show proof of receiving three doses of hepatitis B vaccine to be enrolled in a licensed child care center or school per Iowa Administrative Code 641.1.

What should be done after a known or suspected exposure?
For ANY exposure of a person not previously vaccinated, hepatitis B vaccine is ALWAYS recommended. Exposure should be reported and a postexposure evaluation done. Treatment will depend on the vaccination status of the exposed, the vaccine responder status of the exposed and the hepatitis status of the source if known.

What measures need to be taken for the pregnant women and the newborn?
Prenatal screening of all pregnant women identifies those who are HBsAg positive. Immediate treatment of infants born to HBsAg positive mothers with HBIG and Hepatitis B vaccine is recommended. If the mother is not currently infected with hepatitis B but presents during prenatal care with risk factors, vaccination is indicated. Pregnancy is not a contraindication to vaccination.

Does HBIG and Hepatitis B vaccine interfere with routine childhood immunizations?
Vaccinations with live virus vaccines should be deferred until about 3 months after administration of HBIG. The hepatitis B vaccine does not interfere with other childhood immunizations.

Is risk of transmission in child care centers high?
No, the risk of transmission in child care centers appears to be extremely low. Standard Precautions apply.

When is a person no longer infectious?
If a person is HBsAg and HBc IgM negative, then they are no longer infectious.

What if there appears to be an outbreak?
If there are 2 or more current cases with a suspected common source, contact the Center for Acute Disease Epidemiology at (800) 362-2736.

FACT SHEET HEPATITIS B

Information for Pregnant Women and their Health Care Providers

Who should be tested for hepatitis B?

All pregnant women should be tested routinely for HBsAg during an early prenatal visit (e.g., first trimester) in each pregnancy, even if they have been previously vaccinated, tested, or previously HBsAg positive.

In special situations, an additional HBsAg test can be ordered during the third trimester. This should be considered if the patient develops symptoms, is exposed to HBV, or engages in high risk behavior (e.g., having had more than one sex partner in the previous 6 months, having a HBsAg positive sex partner, evaluation or treatment for a sexually transmitted disease [STD], or recent/current injection-drug use).

Are some people more likely to have hepatitis B than others?

Residents and descendents of certain countries and regions of the world are more prone to HBsAg infection as the disease was, or currently is, endemic. Patients from the following countries/regions may have an increased risk for HBsAg infection: Afghanistan, Africa, rural Alaska, Albania, Bangladesh, Bosnia and Herzegovina, Bulgaria, Cambodia, China, Eastern Europe, Haiti, Hawaii, India, Indonesia, Iran, Iraq, Korea, Laos, Malaysia, the Middle East, Myanmar, Pakistan, the Pacific Islands, Philippines, Romania, the former Soviet Union, South America's Amazon Basin, Sri Lanka, Syria, Taiwan, Thailand, or Vietnam.

What if a patient was not tested before they arrive at the hospital for delivery?

Women who were not screened prenatally, those who engage in behaviors that put them at high risk for infection (see high risk behaviors on the previous page) and those with clinical hepatitis should be tested at the time of admission for delivery. Women admitted for delivery without documentation of HBsAg test results should have blood drawn and tested as soon as possible after admission. While test results are pending, all infants born to women without documentation of HBsAg test results should receive the first dose of single-antigen hepatitis B vaccine within 12 hours of birth.

Care of infants born to HBsAg-positive mothers:

If the mother is determined to be HBsAg positive and the child weighs 2,000 grams (4.4 lbs) or more at birth:

- Give infant HBIG and HBV vaccine within 12 hours of birth
- Continue vaccine series on an accelerated schedule beginning at 1-2 months of age and completing the 3 dose series by 6 months
- Check quantitative anti-HBs and HBsAg after completion of vaccine series at 9-12 months of age.

If the mother is determined to be HBsAg positive and the child weighs 2,000 grams (4.4 lbs) or less at birth:

- Give infant HBIG and HBV vaccine within 12 hours of birth
- Continue vaccine series on an accelerated schedule beginning at 1-2 months of age and completing the 3 dose series by 6 months
- Do not count birth dose as part of vaccine series. The second dose of HBV vaccine should be given when the infant is chronologically one month of age regardless of weight. The third dose should be administered one month following the second dose, and the fourth dose should be given six months following the second dose. Thus, a total of four doses of HBV vaccine are recommended in this circumstance. Immunize with 4 doses of vaccine.
- Check quantitative anti-HBs and HBsAg after completion of vaccine series at 9-12 months of age

Care of infants born to HBsAg status-unknown mothers:

If the mother's HBsAg status is unknown and the child weighs 2,000 grams (4.4 lbs) or more at birth:

- Test mother for HBsAg immediately after admission
- Give infant HBV vaccine within 12 hours of birth
- Give infant HBIG (within 7 days) if mother tests HBsAg positive. If the mother's HBsAg status remains unknown at the time of discharge it may be appropriate to provide HBIG to the child prior to release from the hospital. Efforts should be made to determine HBsAg status prior to discharge, but in the absence of this information and faced with a situation where it is uncertain the child will receive appropriate follow-up, providing HBIG may be appropriate.
- Continue vaccine series beginning at 1-2 months of age according to the recommended schedule based on mother's HBsAg status

If the mother's HBsAg status is unknown and the child weighs 2,000 grams (4.4 lbs) or less at birth:

- Test mother for HBsAg immediately after admission
- Give infant HBV vaccine within 12 hours of birth
- Give infant HBIG if mother tests HBsAg positive OR if mother's HBsAg result is not available within 12 hours of birth
- Do not count birth dose as part of vaccine series, immunize with 4 doses of vaccine
- Continue vaccine series beginning at 1-2 months of age according to the recommended schedule based on mother's HBsAg status
- Check quantitative anti-HBs and HBsAg after completion of vaccine series at 9-12 months of age

Care for HBsAg negative mothers:

If the mother is determined to be HBsAg negative, the vaccine series should be completed according to the Recommended Childhood and Adolescent Immunization Schedule (birth, 1-2, and 6-18 months).

What if there are extended intervals between doses of vaccine?

All doses not violating the minimum intervals are valid. It is not necessary to restart the vaccine series if there is an extended interval between doses. The minimum interval between the first and second dose is 28 days. The minimum interval between the second and third dose is 2 months and 4 months from the first dose, as long as the third dose is given after 6 months of age.

Why should the infant have post vaccination serology?

Post-vaccination serology for infants born to HBsAg positive mothers is the method of confirming protection from HBV. Post-vaccination serology is a key component to case management of the child. Post-vaccination testing for HBsAg and quantitative anti-HBs should be performed after completion of the vaccine series 3 to 9 months following the final dose of hepatitis B vaccine (generally at the 12 month well-child visit, although encouraged to be performed earlier if applicable).

It is very important the provider order quantitative anti-HBs. Without ordering a quantitative anti-HBs, there is no way to determine the antibody concentration and thus determine if the infant is protected (greater than 10 mIU/mL) or needs further doses of vaccine (less than 10 mIU/mL).

Testing should not be performed before age 9 months to avoid detection of anti-HBs from HBIG administered during infancy. Anti-HBc testing of infants is not recommended because passively acquired maternal anti-HBc might be detected in infants born to HBV-infected mothers to age 24 months.

What is the follow-up for test results?

HBsAg-negative infants with anti-HBs levels equal to or greater than 10mIU/mL are protected and need no further medical management.

HBsAg-negative infants with anti-HBs levels less than 10mIU/mL should be revaccinated with a second 3-dose series (either using spacing of doses at 0, 2, and 4-month intervals or 0, 1, and 4-month intervals) and retested 1 month after the final dose of vaccine.

Infants who are HBsAg positive should receive appropriate follow-up including periodic evaluation for liver function.

What about others living in the same house as the HBsAg positive mother?

Other children in the home should have verified vaccination status and possible serologic testing.

Sex partners of HBsAg-positive persons should be counseled to use methods (e.g., condoms) to protect themselves from sexual exposure to infectious body fluids (e.g., semen or vaginal secretions) unless they have demonstrated immunity after vaccination (i.e., anti-HBs >10 mIU/mL) or previously infected (anti-HBc positive). Additionally, household contacts should be counseled to refrain from sharing household articles (e.g., toothbrushes, razors, nail clippers and files, or personal injection equipment) that could become contaminated with blood

FACT SHEET HEPATITIS B

Information for Persons with Acute Hepatitis

What is hepatitis B?
Hepatitis B is a virus that enters the bloodstream and then infects the liver.

How is the virus spread?
Hepatitis B is most often spread from person to person through contact with infected semen, vaginal secretions, or blood. Having sex with an infected person and sharing needles for drug use are two very common ways that people become infected. Babies born to infected mothers and people who live in the house with a "carrier" of hepatitis B are also at risk.

What happens after a person is exposed to hepatitis B?
After a person is exposed to hepatitis B, several things may happen: 1) they may not become infected, 2) they may become infected but not get sick, or 3) they may become infected and get sick.

How soon do the symptoms appear?
It takes anywhere from 2 - 6 months after exposure before the symptoms of infection show.

What are the symptoms?
Symptoms include being very tired, nausea, vomiting, fever, stomach pain, tea-colored urine, and yellowing of skin and eyes (jaundice). Symptoms may be mild or they may be very severe. Remember, most people infected with hepatitis B do not develop all these symptoms and may never know they are infected.

How long can an infected person spread the virus?
Most adults with hepatitis B will get rid of the virus within 4 to 6 months but are able to spread the infection during this time. After their body gets rid of the infection they will no longer be capable of giving the infection to others and they can never get it again. However, about one out of every 10 infected adults, and as many as 9 of 10 infected babies, will become life-long "carriers" of hepatitis B, meaning that they do not get rid of the virus and can infect others. Most hepatitis B carriers have no symptoms of hepatitis, but some will develop serious liver disease years later.

What can you do to take care of yourself?

- Avoid alcoholic beverages and street drugs. They will damage your liver.
- Avoid taking prescription or over-the-counter medicines unless your doctor tells you it is OK.
- Eat a healthy diet (low fat) and get enough rest. If you are vomiting after eating tell your doctor.
  a. See your doctor for a check-up and discuss having a blood test (6 months after you first became infected) to see if you have become a carrier of hepatitis B. Carriers may develop serious liver disease in the future and can pass the disease on to others.
- If you get pregnant, tell your doctor you have hepatitis B. The baby will need to receive hepatitis B immune globulin and the first dose of the hepatitis B vaccine at birth. The baby will also need to complete the vaccine series by 6 months of age and then have post-vaccination testing to assure they are protected.
- Contact the American Liver Foundation for more information (toll-free: 1-800-223-0179).

What can you do to protect others?

- Cover all cuts and sores with a bandage and wash hands well after touching blood or body fluids.
- Throw away any items that have your blood on them, such as bandages and menstrual pads, in plastic bags and close tightly. Wash hands well after touching your blood or body fluids.
- Clean up blood spills with paper towels. Then clean the area with a bleach solution (1 part bleach to 100 parts water, one-quarter cup bleach to a gallon of water).
- Tell your sex partner that you have hepatitis B, use a condom, and encourage your partner to be tested and, if necessary, vaccinated against hepatitis B.
- Have your sex partners and all those living in your household to see a doctor for testing and for hepatitis B vaccination. Do not allow anyone to come into contact with your blood or body fluids.
- Do not share chewing gum, toothbrushes, razors, scissors, needles for ear piercing, nail files, or anything else that may come in contact with your blood or body fluids.
- Do not share food, drink, cigarettes, lipstick, or lip balm.
- Do not share syringes and needles
- Do not donate blood, plasma, body organs, sperm, or breast milk

Hepatitis B/C (acute or chronic)

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name: Facility phone: ( )- - Type:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Parent with partner ☐ Widowed ☐ Married ☐ Separated
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Onset date: / / Diagnosis date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown Date of Death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider type: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS (LIST ALL CURRENT AND PREVIOUS LAB RESULTS)

Laboratory:
Accession #:
Collection date: / /
Date received: / /
Specimen source:
Result date: / /

Test type: *Hepatitis B/D*
☐ Hepatitis B surface antigen (HBsAg)
☐ Hepatitis B core IgM antibody (IgM HBc/IgM anti-HBc)
☐ Hepatitis B e antigen (HBeAg)
☐ Hepatitis B core antibody total IgM/IgG antibody (HBc total/anti-HBc)
☐ Hepatitis B core IgG antibody (IgG HBc/IgG anti-HBc)
☐ Hepatitis B DNA (HBV DNA)
☐ Hepatitis B surface antibody (anti-HBs)
☐ Hepatitis D (anti-HDV)

Test type: *Hepatitis C*
☐ Hepatitis C antibody (anti-HCV) ☐ Hepatitis C RNA (HCV RNA)
☐ Hepatitis C RIBA (HCV RIBA) ☐ Hepatitis C Genotype ☐ Hepatitis C IgG (EIA)
☐ Hepatitis C DNA QL

Result type: ☐ Preliminary ☐ Final Result: ☐ Positive ☐ Negative

Laboratory: _____
Accession #: _____
Collection date: / /
Date received: / /
Specimen source: _____
Result date: / /

Test type: *Hepatitis B/D*
☐ Hepatitis B surface antigen (HBsAg)
☐ Hepatitis B core IgM antibody (IgM HBc/IgM anti-HBc)
☐ Hepatitis B e antigen (HBeAg)
☐ Hepatitis B core antibody total IgM/IgG antibody (HBc total/anti-HBc)
☐ Hepatitis B core IgG antibody (IgG HBc/IgG anti-HBc)
☐ Hepatitis B DNA (HBV DNA)
☐ Hepatitis B surface antibody (anti-HBs)
☐ Hepatitis D (anti-HDV)

Test type: *Hepatitis C*
☐ Hepatitis C antibody (anti-HCV) ☐ Hepatitis C RNA (HCV RNA)
☐ Hepatitis C RIBA (HCV RIBA) ☐ Hepatitis C Genotype
☐ Hepatitis C DNA QL ☐ Hepatitis C IgG (EIA)

Result type: ☐ Preliminary ☐ Final Result: ☐ Positive ☐ Negative

Laboratory: _____
Accession #: _____
Collection date: / /
Date received: / /
Specimen source: _____
Result date: / /

Test type: *Hepatitis B/D*
☐ Hepatitis B surface antigen (HBsAg)
☐ Hepatitis B core IgM antibody (IgM HBc/IgM anti-HBc)
☐ Hepatitis B e antigen (HBeAg)
☐ Hepatitis B core antibody total IgM/IgG antibody (HBc total/anti-HBc)
☐ Hepatitis B core IgG antibody (IgG HBc/IgG anti-HBc)
☐ Hepatitis B DNA (HBV DNA)
☐ Hepatitis B surface antibody (anti-HBs)
☐ Hepatitis D (anti-HDV)

Test type: *Hepatitis C*
☐ Hepatitis C antibody (anti-HCV) ☐ Hepatitis C RNA (HCV RNA)
☐ Hepatitis C RIBA (HCV RIBA) ☐ Hepatitis C Genotype
☐ Hepatitis C DNA QL ☐ Hepatitis C IgG (EIA)

Result type: ☐ Preliminary ☐ Final Result: ☐ Positive ☐ Negative

Laboratory: _____
Accession #: _____
Collection date: / /
Date received: / /
Specimen source: _____
Result date: / /

Test type: *Hepatitis B/D*
☐ Hepatitis B surface antigen (HBsAg)
☐ Hepatitis B core IgM antibody (IgM HBc/IgM anti-HBc)
☐ Hepatitis B e antigen (HBeAg)
☐ Hepatitis B core antibody total IgM/IgG antibody (HBc total/anti-HBc)
☐ Hepatitis B core IgG antibody (IgG HBc/IgG anti-HBc)
☐ Hepatitis B DNA (HBV DNA)
☐ Hepatitis B surface antibody (anti-HBs)
☐ Hepatitis D (anti-HDV)

Test type: *Hepatitis C*
☐ Hepatitis C antibody (anti-HCV) ☐ Hepatitis C RNA (HCV RNA)
☐ Hepatitis C RIBA (HCV RIBA) ☐ Hepatitis C Genotype
☐ Hepatitis C DNA QL ☐ Hepatitis C IgG (EIA)

Result type: ☐ Preliminary ☐ Final Result: ☐ Positive ☐ Negative

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown
Date worked from: / /
Date worked to: / /
Removed from duties: ☐ Yes ☐ No ☐ Unknown
Date removed: / /

Job title: _____
Facility name: _____
Address: _____
Zip code: _____
City: _____ State: _____ County: _____
Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Date of First Hep B Symptom Onset: ____/____/____

Has the case ever had any of the following symptoms of hepatitis B or C *(check all that apply)*? ☐ **Yes** ☐ **No**

☐ Jaundice ☐ Nausea ☐ Upper right quadrant pain
☐ Dark urine ☐ Vomiting ☐ Clay-colored stools
☐ Fatigue ☐ Anorexia ☐ Other

Does the case have symptoms now (last 180 days) or did they occur in the past? ☐ Presently symptomatic ☐ Past symptoms

Date of First Hep C Symptom Onset: ____/____/____

Did the patient ever have elevated liver enzymes attributed to hepatitis B or C?
☐ Yes ☐ No ☐ Unk

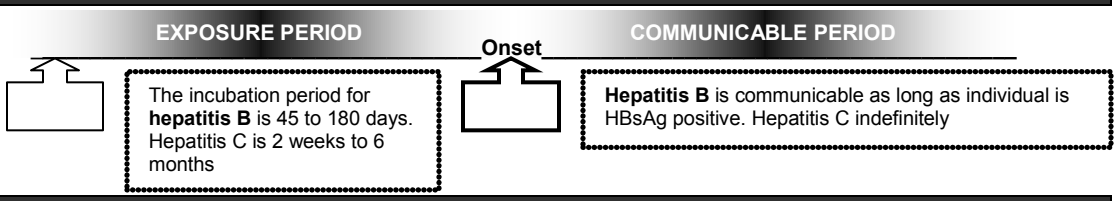
Why was this person tested for Hepatitis B/C *(check all that apply)*?

☐ Needle stick or other exposure ☐ Elevated liver enzymes
☐ Symptoms of hepatitis B or C ☐ Pregnancy screen
☐ Check for immunity due to vaccination ☐ Follow-up on previous diagnosis
☐ Resolved infection ☐ Screening for insurance
☐ Screening for blood/plasma donation ☐ Other, please list reason ____

ALT performed? ☐ Yes ☐ No ☐ Unk	Result (in IU/l):	Expected min (in IU/l):	Expected max in IU/):
AST performed? ☐ Yes ☐ No ☐ Unk	Result (in IU/l):	Expected min (in IU/l):	Expected max in IU/):

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

CASE HISTORY

Was the case diagnosed with hepatitis B? ☐ Yes ☐ No ☐ Unk
Year of diagnosis: _____
Treated for hep B: ☐ Yes ☐ No ☐ Unk
Treatment successful: ☐ Yes ☐ No ☐ Unk

Was the case diagnosed with hepatitis C? ☐ Yes ☐ No ☐ Unk
Year of diagnosis: _____
Treated for hep C: ☐ Yes ☐ No ☐ Unk
Treatment successful: ☐ Yes ☐ No ☐ Unk

Case's mother born outside the U.S.? ☐ Yes ☐ No ☐ Unk
If YES, what country: _____

Case born outside the U.S.? ☐ Yes ☐ No ☐ Unk
If YES, what country: _____

Does the case speak English? ☐ Yes ☐ No ☐ Unk
If No, what language: _____

Case ever had contact with a confirmed or suspected acute/chronic case of hep B or C? ☐ Yes ☐ No ☐ Unk

If YES, type of contact:
☐ Sexual ☐ Yes ☐ No ☐ Unk
☐ Household ☐ Yes ☐ No ☐ Unk
☐ Blood to Mucous Membrane ☐ Yes ☐ No ☐ Unk
☐ Needle sharing ☐ Yes ☐ No ☐ Unk
☐ Other ☐ Yes ☐ No ☐ Unk

Has the case ever received or been exposed to blood or blood products? ☐ Yes ☐ No ☐ Unk
If YES, approximate years received or exposed: ____, ____, ____

Sexual orientation? ☐ Men ☐ Women ☐ Both

Number of sexual partners in lifetime? ☐ 0 ☐ ≤10 ☐ >10

Has the case ever had an organ/tissue transplant? ☐ Yes ☐ No ☐ Unk

Has case ever received a tattoo? ☐ Yes ☐ No ☐ Unk
If YES, was it done in a commercial parlor/shop: ☐ Yes ☐ No ☐ Unk
Name and location of parlor/shop: _____

Case ever used needles for injection of street drugs or steroids (even once)? ☐ Yes ☐ No ☐ Unk

Has the case ever shared needles or works for injecting drugs (even once)? ☐ Yes ☐ No ☐ Unk

Has the case ever snorted cocaine or other street drugs (even once)? ☐ Yes ☐ No ☐ Unk

Is the case a military veteran? ☐ Yes ☐ No ☐ Unk

Does the case currently serve in the military? ☐ Yes ☐ No ☐ Unk

Is the case currently in prison? ☐ Yes ☐ No ☐ Unk
If NO, have you ever been in prison? ☐ Yes ☐ No ☐ Unk
If YES, then list dates to and from: ____/____/____ - ____/____/____

In the 6 months prior to illness did the case…

Case ever had contact with a confirmed or suspected acute/chronic case of hep B or C? ☐ Yes ☐ No ☐ Unk

If YES, type of contact:
☐ Sexual ☐ Yes ☐ No ☐ Unk
☐ Household ☐ Yes ☐ No ☐ Unk
☐ Blood to Mucous Membrane ☐ Yes ☐ No ☐ Unk
☐ Needle sharing ☐ Yes ☐ No ☐ Unk
☐ Other ☐ Yes ☐ No ☐ Unk

Work in the:
Medical ☐ Yes ☐ No ☐ Unk **Dental** ☐ Yes ☐ No ☐ Unk
Other field involving contact with human blood or other body fluids ☐ Yes ☐ No ☐ Unk
Degree of contact with blood: ☐ Frequent ☐ Infrequent ☐ Unk

Received blood or blood products?	☐ Yes	☐ No	☐ Unk
If YES, list dates received: ___/___/___, ___/___/___, ___/___/___			
Receive dialysis?	☐ Yes	☐ No	☐ Unk
Used needles for injection of street drugs or steroids?	☐ Yes	☐ No	☐ Unk
Had dental work or oral surgery?	☐ Yes	☐ No	☐ Unk
Had surgery?	☐ Yes	☐ No	☐ Unk
Acupuncture?	☐ Yes	☐ No	☐ Unk
Body Piercing?	☐ Yes	☐ No	☐ Unk
Received a tattoo?	☐ Yes	☐ No	☐ Unk
If YES, was it done in a commercial parlor/shop?	☐ Yes	☐ No	☐ Unk
Name and location of parlor/shop: _____			
Have you ever had an accidental needle stick?	☐ Yes	☐ No	☐ Unk

VACCINATION HISTORY

Has the patient ever received any doses of the hepatitis B vaccine? ☐ Yes ☐ No ☐ Unknown

Date vaccinated: ___/___/___	Date vaccinated: ___/___/___	Date vaccinated: ___/___/___
Lot #: _____	Lot #: _____	Lot #: _____
Vaccine type: _____	Vaccine type: _____	Vaccine type: _____
Manufacturer: _____	Manufacturer: _____	Manufacturer: _____

Number of vaccinations: ____

Was antibody testing done within 1-6 months after last dose? ☐ Yes ☐ No ☐ Unk If yes, was the antibody test: ☐ Positive ☐ Negative ☐ Unk

Has the patient been vaccinated for hepatitis A? ☐ Yes ☐ No ☐ Unknown

Date vaccinated: ___/___/___	Date vaccinated: ___/___/___	
Lot #: _____	Lot #: _____	
Vaccine type: _____	Vaccine type: _____	
Manufacturer: _____	Manufacturer: _____	

Number of vaccinations: ____

CONTACTS

Is the case pregnant? ☐ Yes ☐ No ☐ Unknown

Anticipated delivering hospital: _____

Has the patient given birth in the last 6 months? ☐ Yes ☐ No ☐ Unknown Hospital: _____

Trimester tested: ☐ 1st ☐ 2nd ☐ 3rd

Infant's Last name: _____

Infants First name: _____

Infant alias: _____

DOB: ___/___/___ Gender: ☐ Female ☐ Male

Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unk ☐ White ☐ Asian

Providers Last name: _____

Providers First name: _____

Provider type: ☐ ARNP ☐ DO ☐ MD ☐ NP ☐ PA

Facility name: _____

Address: _____

Zip code: _____ City: _____

State: _____ County: _____

Phone: ( )- - Type:

Infant serology tested: ☐ Yes ☐ No ☐ Unk

Date: ___/___/___	Date: ___/___/___
HBsAg result: ☐ Positive ☐ Negative ☐ Not done	HBsAg result: ☐ Positive ☐ Negative ☐ Not done
Anti-HBs result: ☐ Positive ☐ Negative ☐ Not done	Anti-HBs result: ☐ Positive ☐ Negative ☐ Not done

Infant immune to hepatitis B: ☐ Infant immune ☐ Infant not immune

Infant immune to hepatitis B: ☐ Infant immune ☐ Infant not immune

Number of people living in case's household: _____

Contacts requiring prophylaxis for hepatitis B- see Epi Manual for guidance on identifying contacts

Name	DOB	Gender	Relationship to case:
	/ /	☐ Male ☐ Female	☐ Spouse ☐ Parent/guardian ☐ Friend/acquaintance ☐ Child ☐ Sexual contact ☐ Contact- work/school/etc ☐ Sibling ☐ Family member (non-household) ☐ Unknown/Other ☐ Roommate

Address/Phone	Zip code
	- -

HBIG received ☐ Yes ☐ No ☐ Unk	**Date given**	/ /
Vaccinated for hep B? ☐ Yes ☐ No ☐ Unk	**Tested for HBsAg?** ☐ Yes ☐ No ☐ Unk	**Tested for Anti-HBs?** ☐ Yes ☐ No ☐ Unk
Date(s) vaccinated: / / , / / , / /	Date: / /	Date: / /
# of vaccinations:	Result:	Result:

Is contact a case? ☐ Yes ☐ No *If this contact is a case create a new event and/or case for this contact.*

Name	DOB	Gender	Relationship to case:
	/ /	☐ Male ☐ Female	☐ Spouse ☐ Parent/guardian ☐ Friend/acquaintance ☐ Child ☐ Sexual contact ☐ Contact- work/school/etc ☐ Sibling ☐ Family member (non-household) ☐ Unknown/Other ☐ Roommate

Address/Phone	Zip code
	- -

HBIG received ☐ Yes ☐ No ☐ Unk	**Date given**	/ /
Vaccinated for hep B? ☐ Yes ☐ No ☐ Unk	**Tested for HBsAg?** ☐ Yes ☐ No ☐ Unk	**Tested for Anti-HBs?** ☐ Yes ☐ No ☐ Unk
Date(s) vaccinated: / / , / / , / /	Date: / /	Date: / /
# of vaccinations:	Result:	Result:

Is contact a case? ☐ Yes ☐ No *If this contact is a case create a new event and/or case for this contact.*

NOTES

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Contact Information

State Perinatal Hepatitis B Prevention Program Coordinator	Bethany Kintigh RN, BSN Perinatal Hepatitis B Prevention Program Bureau of Immunization and Tuberculosis Iowa Department of Public Health 321 East 12th Street Des Moines, IA 50319 Bethany.Kintigh@idph.iowa.gov 515/281-7228 800-831-6293, ext. 7 Fax: 1-800-831-6292
Iowa Immunization Program	www.idph.state.ia.us/ImmTB/Immunization.aspx?prog=Imm&pg=ImmHome Contact Number 1-800-831-6293
Clearinghouse for the hepatitis B Brochures	1-319-398-5133 FAX 1-319-395-7797 www.idph.state.ia.us/ImmTB/Products.aspx?prog=Imm&pg=Products
University of Iowa Hygienic Lab	General Web Address: www.shl.uiowa.edu/ Serology Request Form for Testing: www.shl.uiowa.edu/kitsquotesforms/serologyrequestform.pdf
IDPH Center for Acute Disease Epidemiology	www.idph.state.ia.us/adper/cade.asp Contact Number: (515) 242-5935 or 1-800-362-2736

Statement of Iowa Law and HIPAA

Iowa Code Chapter 139A and 641 Iowa Adm. Code Chapter 1

The Iowa Department of Public Health (IDPH), local boards of health, and local health departments are authorized to access medical records and other information of patients who are infected with or suspected to be infected with a reportable disease. Iowa law clearly outlines all reportable diseases and conditions and investigation methods for reportable diseases such as hepatitis B. (641 IAC chapter 1)

Iowa law further requires health care providers and laboratories to assist in public health disease investigations: "A health care provider and a public, private, or hospital clinical laboratory shall assist in a disease investigation conducted by the department, a local board, or local department. A health care provider and a public, private, or hospital clinical laboratory shall provide the department, local board, or local department with all information necessary to conduct the investigation, including but not limited to medical records; exposure histories; medical histories; contact information; and test results necessary to the investigation, including positive, pending, and negative test results." (Iowa Code section 139A.3; 641 IAC 1.4(3))

HIPAA

Because of the state law requirements listed above, the HIPAA privacy rule expressly permits covered entities (including providers and clinics) to report disease information and participate in a public health disease investigation without obtaining consent or authorization from the patient. (45 CFR 160.203(c); 45 CFR 164.512(a)(1); 45 CFR 164.512(b)(1)(i)) For this reason, IDPH and local public health authorities conducting a hepatitis B investigation are authorized to access patient specific information directly from providers, clinics, and hospitals without obtaining a consent or release from the patient. IDPH and local public health authorities may therefore conduct all activities outlined in the IDPH EPI Manual, Section 2 (Disease Reporting and Case Investigation) and Section 3 (Controlling Further Spread), including case investigation of infants born to HBsAg-positive women, without obtaining consent or authorization from the patient.

For full text of IDPH's HIPAA statement visit:
www.idph.state.ia.us/hipaa_statement.asp

When a Parent Refuses to Provide Information

Parents are not legally required to assist in a case investigation absent the issuance of a subpoena by the department. There have been instances where a parent has refused to provide information to the investigating nurse regarding the HBsAg and/or immunization status of household contacts.

If this occurs while investigating a case, reiterate to the parent the reason for collecting the information, assure them of its confidentiality, and inform them that you will seek the rest of the information needed to complete the Perinatal Hepatitis B Carrier Follow-up Report form directly from the health care provider(s)(both mother's and baby's health care provider).

If they continue to refuse to provide information, document the discussion on the Perinatal Hepatitis B Carrier Follow-up Report form and notify the Perinatal Hepatitis B Prevention Program coordinator not to contact the parent.

As stated above, parents are not required to assist in our case investigation and there should not be pressure applied to them to gain information on the status of household members. Adequate information regarding the HBsAg positive mother and resulting child is obtainable through medical providers.

Hepatitis B Vaccine and HBIG

Hepatitis B Vaccine

- HBsAg is the antigen used in hepatitis B vaccination. Vaccines available in the United States use recombinant DNA technology to express HBsAg in yeast.
- Since March 2000, hepatitis B vaccines produced for distribution in the United States do not contain thimerosal as a preservative or contain only a trace amount (<1.0 mcg mercury/mL) resulting from the manufacturing process.
- Hepatitis B vaccine is available as a single-antigen formulation and also in fixed combination with other vaccines. Two single-antigen vaccines are available in the United States: Recombivax HB® (Merck) and Engerix-B® (GlaxoSmithKline). **Only single antigen vaccine should be used for the birth dose.**
- Of the three licensed combination vaccines two are used for vaccination of infants and young children: Comvax® (Merck & Co) and Pediarix® (GlaxoSmithKline).

Hepatitis B vaccine doses are found in appendix 6 on page 217.

Hepatitis B Immune Globulin (HBIG)

HBIG provides passively acquired anti-HBs and temporary protection (i.e., 3-6 months) when administered in standard doses. HBIG is typically used as an adjunct to hepatitis B vaccine for post-exposure immunoprophylaxis to prevent HBV infection.

HBIG is prepared from the plasma of donors with high concentrations of anti-HBs. HBIG that is commercially available in the United States does not contain thimerosal.

Availability of Hepatitis B Vaccine and HBIG

The VFC program will support requests for four doses of hepatitis B vaccine for routine vaccination of infants when using combination vaccines. However, the Iowa VFC Program asks providers to consider using single antigen hepatitis B vaccine when appropriate. If a client is unable to pay for the hepatitis B vaccine or HBIG* contact:

Bethany Kintigh, RN, BSN
Iowa Department of Public Health, Immunization Program
321 East 12th Street
Des Moines, IA 50319
1-800-831-6293, ext. 7

*IDPH does not keep HBIG on hand. It is vital that we receive notification as soon as the need is identified so that we may order the product directly from the manufacturer.

HBsAg Testing

Purpose

HBsAg is the confirmatory test to indicate a patient is currently infected with the hepatitis B virus.

HBsAg and Infection

The presence of a confirmed HBsAg positive result is indicative of ongoing HBV infection. All HBsAg positive persons should be considered infectious. In newly infected persons, HBsAg is the only serologic marker detected during the first 3-5 weeks after infection, and it persists for variable periods at very low levels. The average time from exposure to detection of HBsAg is 30 days (range: 6-60 days).

University Hygienic Laboratory and Testing

Perinatal serological specimens can be submitted to the University of Iowa State Hygienic Laboratory (SHL) for anyone who is unable to pay for the testing. Those who wish to submit specimens to SHL should contact them at 319-335-4500. For lab slips and instructions on submission go to their Web page: www.shl.uiowa.edu. Click on "Kits, Quotes, and Forms" then scroll down to the "clinical" section – click on S and then select "Serology Test Request Form." **If the patient is known to be pregnant please be sure to mark the "Maternal HBV" box under "Patient History"**.

SHL will notify the Iowa Department of Public Health (IDPH) of HBsAg positive patients.

Reporting of HBsAg positive Tests

If the woman has a positive HBsAg test, the case must be reported to the Iowa Department of Public Health, Center for Acute Disease Epidemiology within one week of diagnosis per Iowa Administrative Code 614 Chapter 1. The case may be reported by:

- Phone (1-800-362-2763)
- Secure fax (515-281-5698) or
- In writing

The form for reporting a hepatitis B case is located in the EPI Manual, Hepatitis B section at:
www.idph.state.ia.us/adper/common/pdf/epi_manual/hepatitis_b.pdf

ACTION

1. If the lab slip comes to you directly from a provider or lab, confirm that the case was reported to IDPH by using IDSS or contacting CADE.
2. Complete Section I of the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report" form.
3. If the case is an existing "chronic" case in IDSS, a "maternal hepatitis B" event will be created to allow preservation of original chronic case file and capture of current pregnancy/hepatitis information.

Hepatitis B Serology

HBsAg:	*Hepatitis B surface antigen* is a marker of infectivity. Its presence indicates either acute or chronic HBV infection.
anti-HBs:	*Antibody to hepatitis B surface antigen* is a marker of immunity. Its presence indicates an immune response to HBV infection, an immune response to vaccination, or the presence of passively acquired antibody. (It is also known as ***HBsAb,*** but this abbreviation is best avoided since it is often confused with abbreviations such as HBsAg.)
anti-HBc (total):	*Antibody to hepatitis B core antigen* is a nonspecific marker of acute, chronic, or resolved HBV infection. It is not a marker of vaccine-induced immunity. It may be used in pre-vaccination testing to determine previous exposure to HBV infection. (It is also known as ***HBcAb***, but this abbreviation is best avoided since it is often confused with other abbreviations.)
IgM anti-HBc:	*IgM antibody subclass of anti-HBc.* Positivity indicates recent infection with HBV (≤6 mos). Its presence indicates acute infection.
HBeAg:	*Hepatitis B "e" antigen* is a marker of a high degree of HBV infectivity, and it correlates with a high level of HBV replication. It is primarily used to help determine the clinical management of patients with chronic HBV infection.
Anti-HBe:	*Antibody to hepatitis B "e" antigen* may be present in an infected or immune person. In persons with chronic HBV infection, its presence suggests a low viral titer and a low degree of infectivity.
HBV-DNA:	*HBV Deoxyribonucleic acid* is a marker of viral replication. It correlates well with infectivity. It is used to assess and monitor the treatment of patients with chronic HBV infection.

Tests	Results	Interpretation	Vaccinate?
HBsAg anti-HBc anti-HBs	negative negative negative	susceptible	vaccinate if indicated
HBsAg anti-HBc anti-HBs	negative negative positive with ≥10mIU/mL*	immune due to vaccination	no vaccination necessary
HBsAg anti-HBc anti-HBs	negative positive positive	immune due to natural infection	no vaccination necessary
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	acutely infected	no vaccination necessary
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	chronically infected	no vaccination necessary (may need treatment)
HBsAg anti-HBc anti-HBs	negative positive negative	four interpretations possible†	use clinical judgment

* Post-vaccination testing, when it is recommended, should be performed 1–2 months after the last dose of vaccine. Infants born to HBsAg-positive mothers should be tested 3–9 months after the last dose.

†1. May be recovering from acute HBV infection

2. May be distantly immune, but the test may not be sensitive enough to detect a very low level of anti-HBs in serum

3. May be susceptible with a false positive anti-HBc

4. May be chronically infected and have an undetectable level of HBsAg present in the serum

Test	Name	Value	Interpretation	Action
HBsAg	Hepatitis B Surface Antigen	Negative		
anti-HBc	Hepatitis B Core Antibody	Negative	Susceptible to HBV	Vaccinate for HBV
anti-HBs	Hepatitis B Surface Antibody	Negative		
HBsAg	Hepatitis B Surface Antigen	Negative		
anti-HBc	Hepatitis B Core Antibody	Negative	Immune to HBV due to vaccination	None Required
anti-HBs	Hepatitis B Surface Antibody	Positive		
HBsAg	Hepatitis B Surface Antigen	Negative		
anti-HBc	Hepatitis B Core Antibody	Positive	Immune to HBV due to infection	Counsel & Treat as Clinically Indicated
anti-HBs	Hepatitis B Surface Antibody	Positive		
HBsAg	Hepatitis B Surface Antigen	Positive		
anti-HBc	Hepatitis B Core Antibody	Positive	Acute HBV infection	Report & Counsel
anti-HBc (IgM)	Hepatitis B Core Antibody (IgM)	Positive		
anti-HBs	Hepatitis B Surface Antibody	Negative		
HBsAg	Hepatitis B Surface Antigen	Positive		
anti-HBc (IgG)	Hepatitis B Core Antibody (IgG)	Positive	Chronic HBV infection	Report & Counsel
anti-HBc (IgM)	Hepatitis B Core Antibody (IgM)	Negative		
anti-HBs	Hepatitis B Surface Antibody	Negative		
			4 Possible Interpretations	
HBsAg	Hepatitis B Surface Antigen	Negative	1. Recovering from acute HBV	Report & Counsel
anti-HBc	Hepatitis B Core Antibody	Positive	2. Distantly immune, ↓ anti-HBV in serum	None Required
anti-HBs	Hepatitis B Surface Antibody	Negative	3. False pos anti-HBc=Susceptible to HBV	R/O False Positive anti-HBc
			4. Chronic, with ↓ level of HBsAg in serum	Report & Counsel
anti-HBe	Hepatitis B Be Antibody	Positive	Resolved acute HBV infection or	F/U Testing: HBV DNA, HBeAg,
			inactive (non-replicating) chronic infection	HBsAg and HBcAb
HBeAg	Hepatitis B Be Antigen	Positive	Active viral replication-high level of infectivity	Report & Counsel
			Seen in both acute HBV & Actively replicating chronic HBV	
HBeAg	Hepatitis B Be Antigen	Negative	*Mutant form of HBV*	Report & Counsel
HBV DNA	Hepatitis B DNA	Positive	Active viral replication with high level of infectivity	
HBeAg	Hepatitis B Be Antigen	Negative		
HBV DNA	Hepatitis B DNA	Negative	Chronic Carrier: Asymptomatic with Normal LFT's	Report & Counsel
HBsAg	Hepatitis B Surface Antigen	Positive	Non-active viral replication and non-infectious to others	Annual blood tests to monitor
anti-HBc (IgG)	Hepatitis B Core Antibody (IgG)	Positive		progression of disease

Screening of Pregnant Women

Purpose	Timely identification of pregnant women who are HBsAg positive provides the opportunity to council the woman and initiate appropriate case management to prevent further transmission of the virus to the neonate and other susceptible household contacts.
Country of Origin	Residents and descendents of certain countries and regions of the world are more prone to HBsAg infection as the disease was, or currently is, endemic. Clients from the following countries/regions may have an increased risk for HBsAg infection: Afghanistan, Africa, rural Alaska, Albania, Bangladesh, Bosnia and Herzegovina, Bulgaria, Cambodia, China, Eastern Europe, Haiti, Hawaii, India, Indonesia, Iran, Iraq, Korea, Laos, Malaysia, the Middle East, Myanmar, Pakistan, the Pacific Islands, Philippines, Romania, the former Soviet Union, South America's Amazon Basin, Sri Lanka, Syria, Taiwan, Thailand, or Vietnam.
Early Testing	**All pregnant women should be tested routinely for HBsAg** during an early prenatal visit (e.g., first trimester) **in each pregnancy**, even if they have been previously vaccinated, tested, or previously HBsAg positive. In special situations, an additional HBsAg test can be ordered during the third trimester. This should be considered if the patient develops symptoms, is exposed to HBV, or engages in high risk behavior (e.g., having had more than one sex partner in the previous 6 months, having a HBsAg positive sex partner, evaluation or treatment for a sexually transmitted disease [STD], or recent/current injection-drug use).
Transfer of Test Results	Women who are HBsAg positive should have a copy of the original laboratory report indicating her HBsAg status provided to the hospital or birth center where delivery is planned and to the health-care provider who will care for the newborn.

Screening of Pregnant Women, Cont.

Admission Testing

Women who were not screened prenatally, those who engage in behaviors that put them at high risk for infection (see high risk behaviors on the previous page) and those with clinical hepatitis should be tested at the time of admission for delivery.

Women admitted for delivery without documentation of HBsAg test results should have blood drawn and tested as soon as possible after admission. While test results are pending, **all** infants born to women without documentation of HBsAg test results should receive the first dose of single-antigen hepatitis B vaccine within 12 hours of birth.

When Testing is not Feasible

When HBsAg testing of pregnant women is not feasible (i.e., in remote areas without access to a laboratory), all infants should receive hepatitis B vaccine less than 12 hours after birth and should complete the hepatitis B vaccine series according to the recommended schedule. Administration of HBIG is not necessary for these infants.

HBsAg Positive Mother

If the mother is determined to be HBsAg positive and the child weighs 2,000 grams (4.4 lbs) or **more** at birth:

- **Give infant HBIG and HBV vaccine within 12 hours of birth**
- Continue vaccine series on an accelerated schedule beginning at 1-2 months of age and completing the 3 dose series by 6 months
- Check quantitative anti-HBs and HBsAg after completion of vaccine series at 9-12 months of age

If the mother is determined to be HBsAg positive and the child weighs 2,000 grams (4.4 lbs) or **less** at birth:

- **Give infant HBIG and HBV vaccine within 12 hours of birth**
- Continue vaccine series on an accelerated schedule beginning at 1-2 months of age and completing the 3 dose series by 6 months
- **Do not count birth dose as part of vaccine series**, immunize with 4 doses of vaccine.
- Check quantitative anti-HBs and HBsAg after completion of vaccine series at 9-12 months of age

Screening of Pregnant Women, Cont.

HBsAg Status Unknown Mother

If the mother's HBsAg status is unknown and the child weighs 2,000 grams (4.4 lbs) or **more** at birth:

- Test mother for HBsAg immediately after admission
- **Give infant HBV vaccine within 12 hours of birth**
- Give infant HBIG (within 7 days) if mother tests HBsAg positive. If the mother's HBsAg status remains unknown at the time of discharge it may be appropriate to provide HBIG to the child prior to release from the hospital. Efforts should be made to determine HBsAg status prior to discharge, but in the absence of this information and faced with a situation where you are unsure the child will receive appropriate follow-up, providing HBIG may be appropriate.
- Continue vaccine series beginning at 1-2 months of age according to the recommended schedule based on mother's HBsAg status

If the mother's HBsAg status is unknown and the child weighs 2,000 grams (4.4 lbs) or **less** at birth:

- Test mother for HBsAg immediately after admission
- **Give infant HBV vaccine within 12 hours of birth**
- **Give infant HBIG if mother tests HBsAg positive OR if mother's HBsAg result is not available within 12 hours of birth**
- **Do not count birth dose as part of vaccine series**, immunize with 4 doses of vaccine
- Continue vaccine series beginning at 1-2 months of age according to the recommended schedule based on mother's HBsAg status
- Check quantitative anti-HBs and HBsAg after completion of vaccine series at 9-12 months of age

HBsAg Negative Mother

If the mother is determined to be HBsAg negative, the vaccine series should be completed according to the Recommended Childhood and Adolescent Immunization Schedule (birth, 1-2, and 6-18 months).

ACTION

1. Confirm with the women's provider that a copy of the original laboratory report indicating her HBsAg status was provided to the hospital where delivery is planned.
2. Contact hospital notifying them of mother's plans for delivery and status.
3. Contact the child's health-care provider and discuss vaccination and HBIG as well as serology.

HBsAg Positive Pregnant Women

HBV Education

HBsAg positive pregnant women should receive information on hepatitis B that includes:

- Modes of transmission and how to prevent transmission
- Perinatal concerns (e.g., there is no contraindication for infants of HBsAg positive mothers to be breast fed beginning immediately after birth. Although HBsAg can be detected in breast milk, there is no evidence that HBV can be transmitted by breastfeeding)
- Prevention of HBV transmission to contacts, including the importance of post-exposure prophylaxis for the newborn, other household contacts, sexual partners, and needle-sharing contacts
- Substance abuse treatment, if appropriate
- Medical evaluation and possible treatment of chronic hepatitis B

ACTION

Contact the woman and provide the following information:

1. How you acquired her name (i.e., hepatitis B is a reportable disease in the state of Iowa and the lab and her provider are required to report the case).
2. Explain your role and discuss what services you will provide to her and household contacts (case management, notification of providers/birth hospital or center, immunization services for eligible contacts, and testing for hepatitis B status).
3. Explain what information you will be collecting while her case is "open." Collect the pertinent information for the visit (delivery plans and household contact information).
4. Provide her with the "Hepatitis B and Moms-to-Be" Brochure.
5. Discuss the importance of the baby completing the vaccine series by six months of age (an infected unprotected baby has a 90% chance of becoming a chronic carrier) and of post-vaccination serology.
6. Enter all case information into IDSS under the "Follow-Up hep B" tab.

Intervention for Infants Born to HBsAg+ Mothers

Term Infants

All infants born to HBsAg positive women should receive single-antigen hepatitis B vaccine (birth dose) and HBIG within 12 hours of birth, administered at different injection sites.

Dose	Timing
#1	Birth dose
#2	28 days from dose #1
#3	2 months from dose #2 **AND** 4 months from dose #1 **AND** the infant is 6 months of age (minimum age 24 weeks)

For information on combination vaccines (Comvax and Pediarix) see the following page.

Preterm Infants

Infants weighing less than 2,000 g (4.4 lbs) born to HBsAg positive mothers **should receive single-antigen hepatitis B vaccine (birth dose) and HBIG within 12 hours of birth**, administered at different injection sites.

For preterm infants weighing less than 2,000 g, the initial vaccine dose (birth dose) **should not be counted** as part of the vaccine series because of the potentially reduced immunogenicity of hepatitis B vaccine in these infants.

The second dose of HBV vaccine should be given when the infant is chronologically one month of age regardless of weight. The third dose should be administered one month following the second dose, and the fourth dose should be given six months following the second dose. Thus, **a total of four doses of HBV vaccine are recommended in this circumstance.**

Extended Intervals Between Doses

All doses not violating the minimum intervals are valid. **It is not necessary to restart the vaccine series if there is an extended interval between doses.**

The minimum interval between the first and second dose is 28 days. The minimum interval between the second and third dose is 2 months and 4 months from the first dose, as long as the third dose is given after 6 months of age (see chart above).

Intervention for Infants Born to HBsAg+ Mothers, Cont.

Pediarix

Pediarix (GSK) is a combination vaccine that contains DTaP, hepatitis B, and IPV. Typically Pediarix is given at 2, 4 and 6 months of age. When giving Pediarix after a birth dose of hepatitis B, the infant will receive a total of 4 doses of hepatitis B vaccine. **Four doses of HBV is permissible when using combination vaccines.**

There is a flow-chart describing how to administer Pediarix and the use of single antigen hepatitis B vaccine in the section titled "Pediarix Series for Hepatitis B Vaccine." (page 22)

Serologic testing following the Pediarix series is performed 3 months after the last dose of vaccine (typically given at 6 months of age). Testing can be done as early as 9 months of age, but is often performed at the routine well child visit at 12 months. Testing should not be done prior to 9 months of age to avoid detection of the anti-HBs from HBIG administered at birth. For more serology information see the section titled "Post-Vaccination Serology."

Comvax

Comvax (Merck) is a combination vaccine that contains HIB and hepatitis B vaccines. Comvax is typically given at 2, 4 and 12 months of age. When giving Comvax, after the birth dose of hepatitis B, the infant will receive a total of 4 doses of hepatitis B vaccine. **Four doses of HBV is permissible when using combination vaccines.**

CDC does not recommend giving 5 doses of HBV. When using the Comvax series some providers want to add an additional dose of monovalent hepatitis B vaccine at 6 months of age and then continue giving the Comvax series leading to 5 total HBV doses. 5 doses of HBV is not recommended.

If the provider uses a monovalent HBV at 6 months of age, (so the child is complete with the HBV series at 6 months) they should not use Comvax at 12 months of age (because the child already has 4 HBV), but should instead use single antigen Hib (Pedvax) to complete the series.

There is a flow-chart describing how to administer Comvax and the use of single antigen hepatitis B vaccine and HIB in the section titled "Comvax Series for Hepatitis B Vaccine." (Page 23)

Serologic testing following the Comvax series is performed 3 months after the last dose of vaccine (typically given at 12 months of age). Testing can be done as early as 4 weeks after the last dose of vaccine is given. For more serology information see the section titled "Post-Vaccination Serology."

Intervention for Infants Born to HBsAg+ Mothers, Cont.

ACTION	1. Contact the birth hospital to complete the infant's information and HBIG/vaccination status in Section II of the "Perinatal Hepatitis B Carrier Follow-up Report" form (Appendix 1). 2. Contact the infant's provider and give them the Hepatitis B vaccine and HBIG information. Stress the importance of adhering to the accelerated schedule (3rd dose at 6 months) and post-vaccination serology at 12 months. 3. Follow the infant through the vaccine series and document vaccination dates. 4. After each dose of vaccine enter dates into IDSS under the "Follow-Up hep B" tab.

Post-Vaccination Serology

Purpose

Post-vaccination serology for infants born to HBsAg positive mothers is the method of confirming protection from HBV. **Post-vaccination serology is a key component to case management of the child.**

Post-Vaccination Serology after the Initial Series

Post-vaccination testing for HBsAg and quantitative anti-HBs should be performed after completion of the vaccine series 3 to 9 months following the final dose of hepatitis B vaccine (generally at the 12 month well-child visit, although encouraged to be performed earlier if applicable).

It is very important to have the provider order quantitative anti-HBs. Without ordering a quantitative anti-HBs, there is no way to determine the antibody concentration and thus determine if the infant is protected (greater than 10 mIU/mL) or needs further doses of vaccine (less than 10 mIU/mL). See "Test Results" section below.

Testing should not be performed before age 9 months to avoid detection of anti-HBs from HBIG administered during infancy. Anti-HBc testing of infants is not recommended because passively acquired maternal anti-HBc might be detected in infants born to HBV-infected mothers to age 24 months.

The AAP and ACIP have both recommended the use of combination vaccines, such as Comvax of Pediarix, when indicated. **However, combination vaccines can create differences in timing as to when post-vaccination serology is performed.**

Pediarix: the last dose of Pediarix should be given at 6 months, and serology should be drawn 3 months later at the 9 month visit. There are some clinics that prefer to bring the child back at the routine 12 month visit and test them at that time. This is permissible, although it is preferred to test the child after 9 months of age so that revaccination can begin sooner, if necessary.

Comvax: the last dose of Comvax should be given at 12 months of age, and serology should be drawn 1 month (4 weeks) later. There are some clinics that prefer to bring the child back at the routine 18 month visit and test them at that time. This is permissible although not ideal. It is preferred to test the child 1 month after the last dose of Comvax so that revaccination can begin sooner, if necessary.

There is an option to give Comvax for the first 2 doses of the series then give single antigen HBV at 6 months of age with a Pedvax Hib at 12 months of age. This method would allow the provider to draw serology as early as 9 months of age. See page 23 for more detail.

Post-Vaccination Serology, Cont.

Post-Vaccination Serology More Than Two Years after Completing the Series

Post-vaccination serology done more than two years after the third dose of vaccine causes difficulty in interpreting the anti-HBs result because antibody levels begin to decrease in the blood below detectable levels, even though the child may still have active immunity.

The child should receive **one additional dose** of vaccine (it is permissible to have 5 total doses in the series in this instance) and then have HBsAg and quantitative anti-HBs serology drawn 4-6 weeks after that dose to check immunity. This single dose is designed to "wake up" the immune response and then allow determination of protection.

Test Results

HBsAg negative Infants:

- HBsAg-negative infants with anti-HBs levels equal to or greater than 10mIU/mL are protected and need no further medical management.
- HBsAg-negative infants with anti-HBs levels less than 10mIU/mL should be revaccinated with a second 3-dose series (either using 0, 2, 4 months or 0, 1, 4 months schedule) and retested 1 month after the final dose of vaccine.

Infants who are HBsAg positive should receive appropriate follow-up including periodic evaluation for liver function.

Test Results Continued

Post-vaccination serology done more than two years after the third dose of vaccine with results of **anti-HBs negative and HBsAg negative**, the child should receive one additional dose of HBV vaccine and then have a serology done 1 month after the final dose.

Post-vaccine serology was done less than one year after the third dose of vaccine with results of **anti-HBs negative and HBsAg negative**, the child should receive 3 more doses of HBV vaccine followed by serology done 1 month after the final dose.

ACTION	1. Complete Section III of the "Perinatal Hepatitis B Carrier Follow-up Report" form (Appendix 1) upon post-vaccination serology and if necessary assist with referrals for HBsAg positive infant. Enter information into IDSS under the "Follow-Up Hep B" tab. 2. **Immediately** notify IDPH Perinatal Hepatitis B Prevention Program Coordinator of HBsAg positive infant by calling 1-800-831-6293, ext. 7. 3. Notify IDPH Perinatal Hepatitis B Prevention Program Coordinator after serologic testing is completed and all data for case has been entered.

Testing and Vaccination of Household and Sexual Contacts

Transmission Reduction

Sex partners of HBsAg-positive persons should be counseled to use methods (e.g., condoms) to protect themselves from sexual exposure to infectious body fluids (e.g., semen or vaginal secretions) unless they have demonstrated immunity after vaccination (i.e., anti-HBs >10 mIU/mL) or previously infected (anti-HBc positive).

Additionally, household contacts should be counseled to refrain from sharing household articles (e.g., toothbrushes, razors, nail clippers and files, or personal injection equipment) that could become contaminated with blood.

Pre and Post-Vaccination Serologic Testing and Vaccination

Screening is usually cost-effective, and should be considered in groups with a high risk of HBV infection (prevalence of HBV markers 20% or higher) such as men who have sex with men, injection-drug users, Alaska natives, Pacific Islanders, children of immigrants from endemic-disease countries, and family members of HBsAg-positive persons.

Unvaccinated sex partners, household contacts, and needle-sharing contacts should be tested for susceptibility to HBV infection and should receive the first dose of hepatitis B vaccine immediately after collection of the blood sample for serologic testing.

Susceptible persons should complete the vaccine series using an age-appropriate vaccine dose and schedule (see Adult Vaccine and Vaccine Efficacy below). Persons who have begun the series in the past but did not complete it should now complete the full series. **It is not necessary to restart the vaccine series if there is an extended interval between doses.**

Post-Vaccination serologic testing is also recommended for sex partners of HBsAg-positive persons. When necessary, post-vaccination testing should be performed 1–2 months after completion of the vaccine series.

Children at Risk

Children who are not infected at birth remain at risk from long-term interpersonal contact with their infected mothers. In one study, 38% of infants who were born to HBsAg positive mothers and who were not infected prenatally became infected by 4 years of age.

In addition, children living with any chronically infected persons are at risk for becoming infected through percutaneous or mucosal exposures to blood or infectious body fluids (e.g., sharing a toothbrush, contact with exudates from dermatologic lesions, contact with HBsAg-contaminated surfaces). HBV transmission rates to susceptible household contacts of chronically infected persons have varied (range: 14%–60%).

Testing and Vaccination of Household and Sexual Contacts, Cont.

Availability of HBV Vaccine

HBV vaccine provided by IDPH for contacts of HBsAg positive women is limited to children through the age of 18, primary sexual contacts, household contacts, and needle sharing partners who have no method of payment for vaccine. Vaccine may be ordered from IDPH on an as needed basis and is not routinely maintained.

IDPH makes available HBV vaccine for children through 18 years of age who are living with a HBsAg positive woman and is provided at no cost to the client through the VFC Program. Agencies may administer HBV vaccine to these children in the same manner they would to any other VFC eligible child and no special arrangements are necessary to obtain vaccine through IDPH.

Agencies that identify a susceptible adult contact of a HBsAg positive woman are to contact the State Perinatal HBV Prevention Program Coordinator at 1-800-831-6293, ext. 7 to make arrangements to receive HBV vaccine. HBV vaccine is made available to adult household contacts (persons over the age of 19) through non-federal funding.

Clients immunized with state supplied vaccine must be entered and maintained in IRIS (Iowa's Immunization Registry Information System). Vaccine administration recommendations and inventory requirements must be followed in accordance with current IDPH Immunization Program protocols.

Testing and Vaccination of Household and Sexual Contacts, Cont.

Adult Vaccination and Vaccine Efficacy

Adults 20 years of age and older should receive 1 mL (10 mcg) of pediatric or adult formulation Recombivax HB (Merck) or 1 mL (20 mcg) of adult formulation Engerix-B (GlaxoSmithKline). The pediatric formulation of Engerix-B is not approved for use in adults.

The usual schedule for adults is two doses separated by no less than 4 weeks, and a third dose 4–6 months after the second dose. If an **accelerated schedule** is needed, the minimum interval between the first two doses is 4 weeks, and the minimum interval between the second and third doses is 8 weeks. However, **the first and third doses should be separated by no less than 16 weeks**. Doses given at less than these minimum intervals should not be counted as part of the vaccination series

Protection* by Age Group and Dose		
Dose	**Infants****	**Teens and Adults*****
1	16%-40%	20%-30%
2	89%-95%	75%-80%
3	98%-100%	90%-95%

*anti-HBs antibody titer of 10mIU.mL or higher
**preterm infants less than 2kg have been shown to respond to vaccination less often.
***factors that may lower vaccine response rates are age >40 years, male, smoking, obesity, and immune deficiency

ACTION

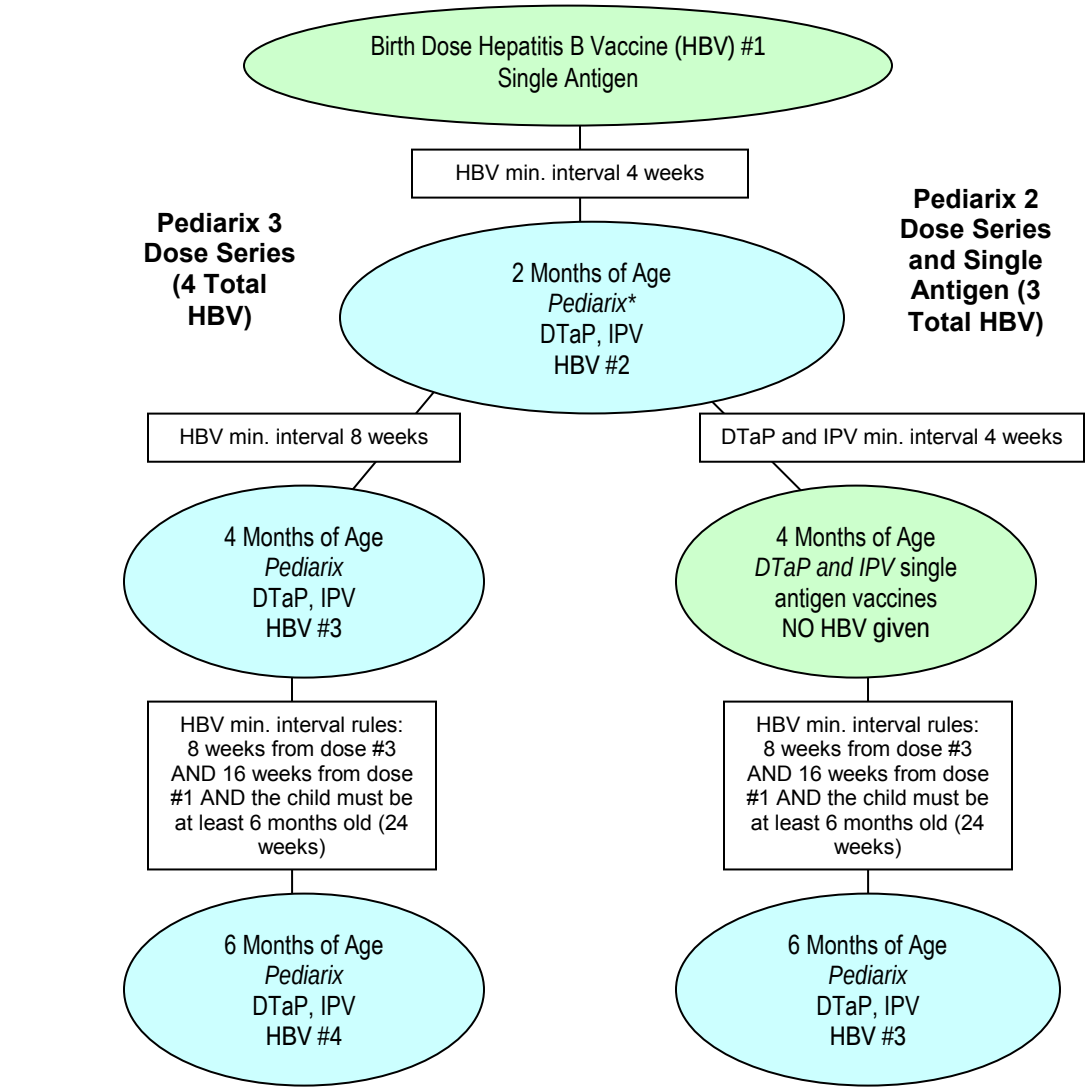
1. Obtain household contact information and complete pre-vaccination serologic testing of unvaccinated primary sexual partners and adult household contacts.
2. Assure children living in the household are either vaccinated or currently receiving the HBV vaccine series.
3. As needed, make arrangements for vaccination and testing of susceptible contacts.
4. Complete Section IV of the “Perinatal Hepatitis B Carrier Follow-up Report” form (Appendix 1). Enter data into IDSS on the “Follow-Up Hep B” tab under contacts.

Checklist for Follow-Up of Infants

Purpose	To outline the steps to be carried out by local public health for follow-up of infants born to women who are hepatitis B carriers. It is important to incorporate these steps into your work plan to ensure proper prophylaxis of infants and household contacts of women who are carriers of hepatitis B.
Checklist	Please see "HBsAg+ Exposed Infants Follow-Up Checklist" on page 24.

Pediarix Series for Hepatitis B Vaccine

3 Dose versus 4 Dose Series

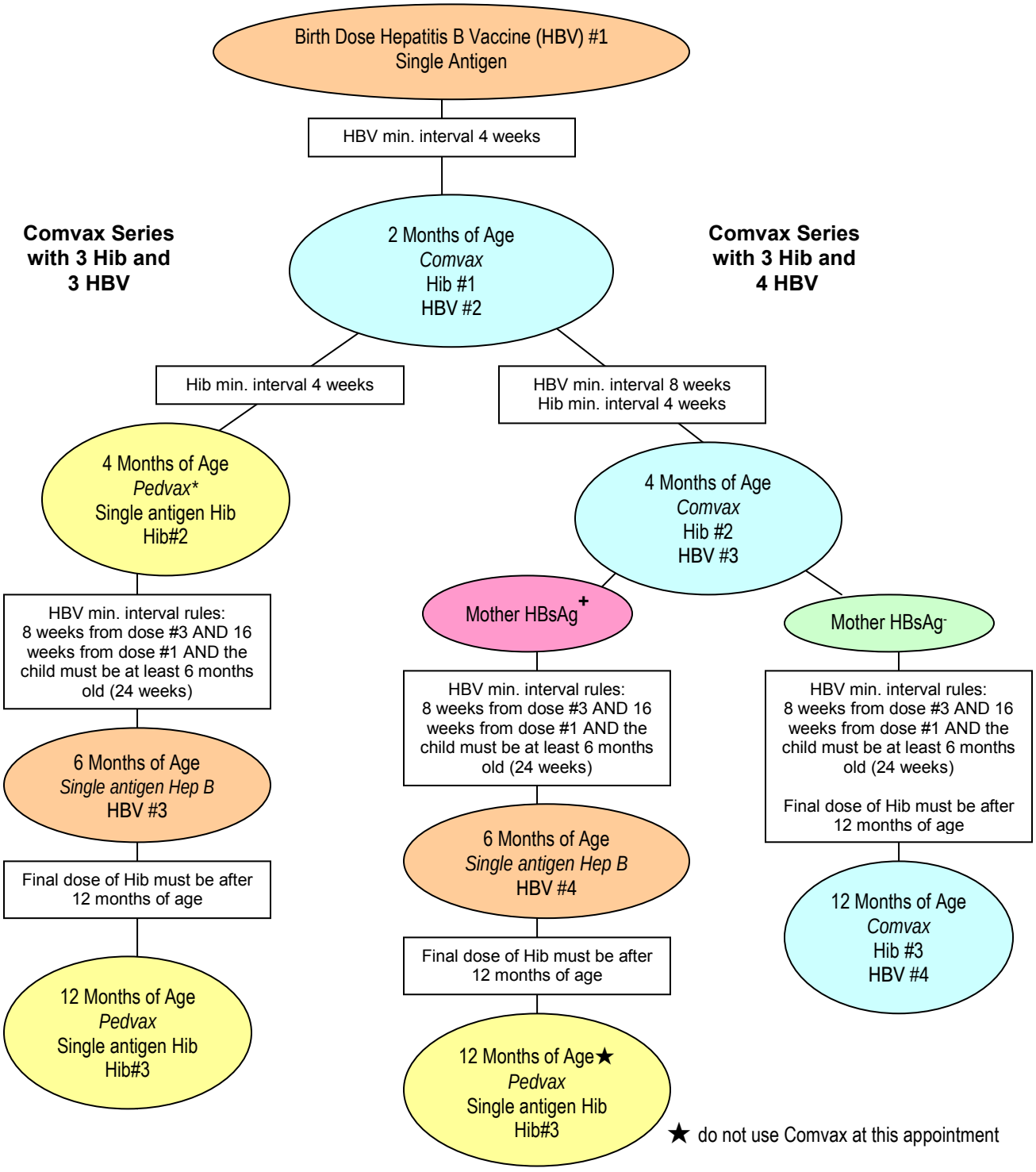


*Pediarix contains DTaP, IPV and Hep B

Single Antigen

Comvax Series for Hepatitis B Vaccine

3 Dose versus 4 Dose Series



*PedVax – contains HIB and is a 3 dose series

Reference Material

IDPH Brochures	Immunize for a Better Life Hepatitis B Brochure for providers and mothers are available free of charge from the clearinghouse 1-19-398-5133.
Hepatitis B and Mom's to Be Brochure	Available from Bethany Kintigh, State Perinatal Hepatitis B Prevention Program Coordinator. 1-800-831-6293 ext. 7.
Hepatitis B Recommendation Alert	Pre-printed copies are available from Bethany Kintigh, State Perinatal Hepatitis B Prevention Program Coordinator. 1-800-831-6293 ext. 7 or on the IDPH webpage at: www.idph.state.ia.us/adper/common/pdf/hepatitis/hep_b_alert_march_2006.pdf
VIS Statements in multiple languages	www.immunize.org/vis/index.htm#hepatitisb
CDC National Immunization Program Homepage	www.cdc.gov/nip/default.htm
Immunization Action Coalition Homepage	www.immunize.org
Hepatitis B Foundation	www.hepb.org/
Parents of Kids with Infections Diseases	www.pkids.org/index2.htm

HBsAg+ Exposed Infants Follow-Up Checklist

Prior to Delivery:

- ❑ Contact the mother's provider. Make sure they are aware of her HBsAg positive lab result, the indicated immunoprophylaxis (HBIG) for the infant, and provide the brochure "Perinatal Hepatitis B Providers Guide."
- ❑ Contact the hospital or delivery center to make sure that they will have HBIG on hand and that the mother's HBsAg status is noted in her prenatal record.
- ❑ Prior to delivery, call, write, or make a home visit to the client and provide perinatal hepatitis B educational materials (including the "Hepatitis B and Moms-to-Be Brochure").
- ❑ Complete Section I of the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form" with demographic information on mom. Educate the client on how to reduce risk of transmission of hepatitis B to her infant and household members.
- ❑ Complete Section IV on the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form" Identify susceptible household contacts (children and sexual contacts) and encourage them to be tested and vaccinated.

After Delivery:

- ❑ Complete Section II of the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form" with the infant's birth date and dates for HBIG and the 1st dose of vaccine.
- ❑ Notify the client's pediatric provider of the mother's positive HBsAg status and remind them that the infant should receive the 2nd dose of vaccine at one to two months and the 3rd dose of vaccine at 6 months of age as well as post-vaccination serology between 9 and 12 months of age. Make follow-up calls or visits with the client to make sure that her baby has gone in for his/her vaccinations and serology test.
- ❑ At 12 months of age, collect post-vaccination serology results. Be sure the provider tests for both HBsAg and quantitative Anti-HBs. Complete Section II of the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form."
- ❑ If infant doesn't develop an antibody response to the HBV vaccine and remains negative for hepatitis B infection, call the clinic and fax/send a request to ensure that a second series of HBV vaccine is given.
- ❑ Complete the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form" with all shot dates and test results and fax/send to IDPH.

Periodically update the Perinatal Hepatitis B Prevention Program with your progress at the following intervals:

- After Section I is completed for mom and household contacts have been identified (Section IV)
- After contacts have completed the first does in the series, or had serology to indicate no vaccine is needed (Section IV).
- After the baby is born and HBIG and birth dose of vaccine have been given.
- Upon completion of each dose of vaccine in the series for newborn and contacts.
- Upon completion of serology for infant and closing of case.

Please send results by fax (1-800-831-6292) or e-mail to: Bethany.Kintigh@idph.iowa.gov or by mail to:
Bethany Kintigh, RN, BSN IDPH Immunization Program, 321 East 12th Street, Des Moines, IA 50319

Letter to Mothers

ADD YOUR LETTER HEAD

Date

Dear _____:

Congratulations on the birth of your new baby NAME! Your baby received HBIG and the first dose of hepatitis B vaccine on DATE at HOSPITAL NAME. It is very important that your child receive the second and third dose of hepatitis B vaccine on time.

This letter is to remind you that the **second hepatitis B vaccination** is due **no later than two months** of age. The **third hepatitis B vaccination** is due at **six months of age**.

Your baby's health care provider will test your child's blood for the hepatitis B virus **between 9 months and one year of age**. After the blood work is completed and if your baby needs no further doses of hepatitis B vaccine, we will close your case.

I have enclosed information regarding hepatitis B. If you have any questions, you may contact the Perinatal Hepatitis B Prevention Program at YOUR PHONE HERE. Thanks for your cooperation.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

Enc.
Note: Please bring this letter with you to your baby's next doctor appointment for his/her second Hepatitis B shot.

Letter to Mother's Provider

ADD YOUR LETTER HEAD

Date

Dear _____:

The Iowa Department of Public Health received a report for NAME AND DOB indicating she is hepatitis B surface antigen (HBsAg) positive and pregnant.

As you know, CDC recently published a MMWR titled "A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States," December 23, 2005. In that publication CDC laid out the vital role a practitioner plays in preventing perinatal transmission of the hepatitis B virus. I have included a brochure for you to review that outlines the recommendations made in the December 2005 MMWR. The other brochure included in this letter for your patient, stressing the importance of vaccinating her child against HBV infection.

Please remember two critical steps that need to be taken for your patient:

1. Send a copy of the **original lab slip** indicating her HBsAg positive status to the birth hospital or center prior to delivery.
2. Be sure that the child receives **Hepatitis B Immune Globulin (HBIG**) and the first dose of **Hepatitis B Vaccine** within 12 hours of birth.

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Your office may already have a policy in place to address HBV and birth transmission. We appreciate you reviewing this letter and making every effort to protect this child and stop the transmission of HBV at birth.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

General Letter to Hospitals Pre Birth

ADD YOUR LETTERHEAD

Date

Regarding: Pregnant Mother with Hepatitis B

Dear OB STAFF CONTACT:

MOTHER'S NAME AND DOB is HBsAg positive and pregnant. Her estimated due date is DUE DATE. Currently she plans to deliver at your hospital.

Upon delivery, her child should receive the first dose of hepatitis B vaccine (HBV) and HBIG (Hepatitis B Immune Globulin) within 12 hours of birth.

Please complete the enclosed form "Perinatal Hepatitis B Hospital Report" regarding the administration of the HBV birth dose and HBIG. Upon completion, please fax this form to YOUR FAX NUMBER. (FORM FOUND IN APPENDIX 2)

For patients that have no means of payment for HBIG and hepatitis B vaccine, please contact me. The Iowa Department of Public Health can provide these important vaccinations without charge through the Vaccines for Children Program (VFC). **However, IDPH does not maintain HBIG on hand** so advance warning is necessary to order this product from the manufacturer.

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

Enc

General Letter to Baby's Provider Pre Birth

ADD YOUR LETTERHEAD

Date

Regarding: Pregnant Mother with Hepatitis B

Dear Health Care Provider:

MOTHER'S NAME is HBsAg positive and pregnant. Her estimated due date is DUE DATE. Currently she plans to deliver her baby at HOSPITAL NAME and bring her child to your clinic for well-child checkups and immunizations. This child should receive the first dose of hepatitis B vaccine (HBV) and HBIG within 12 hours of birth. Due to the exposure to hepatitis B at birth, it is very important that this child receive the 2nd and 3rd dose of vaccine on time.

In adherence with the Recommended Childhood and Adolescent Immunization Schedule, we recommend that infants born to HBsAg positive mothers receive their **second dose of HBV at one-two months of age**, followed by the **third dose at six months of age**.

Post-vaccination serologic testing is essential for these infants. **Both HBsAg and quantitative anti-HBs** lab tests should be performed after completion of the vaccine series; three to nine months following the final dose of hepatitis B vaccine (generally at the 12 month visit, although can be drawn as early as 9 months of age). Without serologic testing the outcome of the preventive therapy is unknown and opportunities to revaccinate or treat are missed. I will be following up with your office regarding the test results.

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

General Letter to Baby's Provider Post Birth

ADD YOUR LETTERHEAD

Date

Regarding: CHILDS NAME/BIRTH DATE

Dear Health Care Provider:

CHILDS NAME birth date BIRTH DATE was born to an identified HBsAg positive mother NAME. This child is planning to come to your clinic for well-child checkups and immunizations. This child received the first dose of hep B vaccine and HBIG on DATE at HOSPITAL NAME. It is very important that this child receive 2nd and 3rd dose of vaccine on time.

In adherence with the Recommended Childhood and Adolescent Immunization Schedule, we recommend that infants born to HBsAg positive mothers receive their **second dose at one-two months of age**, followed by the **third dose at six months of age**.

Post-vaccination serologic testing is essential for these infants. **Both HBsAg and quantitative anti-HBs** lab tests should be performed after completion of the vaccine series; three to nine months following the final dose of hepatitis B vaccine (generally at the **12 month visit**, although can be drawn as early as 9 months of age). Without serologic testing the outcome of the preventive therapy is unknown and opportunities to revaccinate or treat are missed. Please complete the enclosed form and return to me at YOUR FAX NUMBER.

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

Enc.

Fax for Providers to Report HBV Vaccine Administration

ON YOUR LETTERHEAD

Please complete the following information regarding Hepatitis B vaccination series and post-vaccination serology for: INFANT NAME AND DOB.

Perinatal Hepatitis B Prevention Checklist

☐ HBV – 2nd dose due at 1 month of age

Date given: _____

☐ Faxed results to (YOUR FAX)

☐ HBV – 3rd dose due at 6 months of age

Date given: _____

☐ Faxed results to (YOUR FAX)

☐ Post vaccination serology drawn between 9-12 months of age (not before 9 months of age)

☐ HBsAg Results _____

☐ Quantitative anti-HBs Results _____

☐ Faxed results to (YOUR FAX)

If you have any questions regarding Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Letter Providers Regarding Serology

ADD YOUR LETTERHEAD

Date

Regarding: CHILDS NAME/BIRTH DATE

Dear Health Care Provider:

CHILDS NAME birth date BIRTH DATE was exposed to hepatitis B (HBV) at birth and is now due for **post-vaccination serologic testing for HBV.** Testing for immunity is essential for these infants. **Both HBsAg and quantitative anti-HBs** lab tests should be performed after completion of the vaccine series; three to nine months following the final dose of hepatitis B vaccine (generally at the **12 month visit,** although can be drawn as early as 9 months of age).

Without serologic testing the outcome of the preventive therapy is unknown and opportunities to revaccinate or treat are missed. Please complete the serologic testing results below or fax me a copy of the child's lab slip to me at YOUR FAX NUMBER.

Post vaccination serology drawn between 9-12 months of age (not before 9 months of age)

☐ HBsAg Results _____

☐ Quantitative anti-HBs Results _____

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

Letter Providers Regarding Overdue Serology

ADD YOUR LETTERHEAD

Date

Regarding: CHILDS NAME/BIRTH DATE

Dear Health Care Provider:

CHILDS NAME birth date BIRTH DATE was exposed to hepatitis B at birth and is now **past due for post-vaccination serologic testing for hepatitis B.** Testing for immunity is essential for these infants. **Both HBsAg and quantitative anti-HBs** lab tests should be performed after completion of the vaccine series; three to nine months following the final dose of hepatitis B vaccine (generally at the 12 month visit).

This child is now older than 18 months and needs to be tested soon to determine immunity and if revaccination is needed.

Without serologic testing the outcome of the preventive therapy is unknown and opportunities to revaccinate or treat are missed. Please complete the serologic testing results below or fax me a copy of the child's lab slip to me at YOUR FAX NUMBER.

Post vaccination serology drawn at _____months of age

☐HBsAg Results _____

☐Quantitative anti-HBs Results _____

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

Fax to Providers Regarding Serology

ADD YOUR LETTERHEAD

DATE:

FROM:

TO:

SUBJECT: Hepatitis B Serology Information

As part of the surveillance of reportable disease in Iowa, The Iowa Department of Public Health, Perinatal Hepatitis B Prevention Program needs the Hepatitis B serology information for children born to Hepatitis B positive mothers (Iowa Administrative Code 641, Chapter 1).

The child listed below was exposed to hepatitis B at birth and has completed the hepatitis B vaccine series. This infant is now due for the serology testing. The Centers or Disease Control and Prevention and the Iowa Department of Public Health recommend **post-vaccination testing at 12 months of age,** although can be drawn as early as 9 months of age. Without serologic testing the outcome of preventative therapy is unknown and opportunities to revaccinate or treat the child are missed.

Please fax the following information to YOUR NAME AND FAX:

Child's Name_____ DOB_____

Mother's Name_____ DOB_____

Test Date:_____

Test Results:
Hepatitis B Surface Antigen (HBsAg) _____

Quantitative Hepatitis B Surface Antibody (anti-HBs) _____

If you have questions regarding the Iowa Perinatal Hepatitis B Prevention Program, please contact the State coordinator:

Bethany Kintigh, RN, BSN
Iowa Department of Public Health, Immunization Program
321 East 12th Street
Des Moines, IA 50319
P: 1-800-831-6293 ext.7
Bethany.Kintigh@idph.iowa.gov

Letter Providers Regarding 2nd Series of Immunization

ADD YOUR LETTERHEAD

Date

Regarding: CHILDS NAME/BIRTH DATE

Dear Health Care Provider:

CHILDS NAME birth date BIRTH DATE was exposed to hepatitis B (HBV) at birth. Subsequently, this child received HBV vaccination and post-vaccination serologic testing. **Unfortunately, according to the serology report, the child does not show immunity to hepatitis and requires a second 3 dose series of HBV vaccine.**

The recommended approach is to complete a second 3-dose series of vaccine (again at 0, 2 and 4 months) and re-test for both HBsAg and anti-HBs 1-2 months after the third dose of vaccine. If anti-HBs and HBsAg are still negative after revaccination, the infant is considered a non-responder to hepatitis B vaccine.

Please complete the following information regarding Hepatitis B vaccination series and post-vaccination serology for this infant:

☐ HBV 4 – first dose in second vaccine series (0 months) Date given_____
☐ Faxed results to (YOUR FAX)

☐ HBV5 – second dose in second vaccine series (2 month) Date given_____
☐ Faxed results to (YOUR FAX)

☐ HBV 6 – third dose in second vaccine series (4 months) Date given_____
☐ Faxed results to (YOUR FAX)

Post vaccination serology drawn 1-2 months after last dose of vaccine

☐HBsAg Results _____

☐Quantitative anti-HBs Results _____
☐ Faxed results to (YOUR FAX)

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

Letter Providers Regarding Second Serology

ADD YOUR LETTERHEAD

Date

Regarding: CHILDS NAME/BIRTH DATE

Dear Health Care Provider:

CHILDS NAME birth date BIRTH DATE was exposed to hepatitis B at birth, received two full series of HBV vaccine, and is now due for the **hepatitis b post-vaccination serologic testing for the second series**.

Both HBsAg and quantitative anti-HBs lab tests should be performed 1-2 months after completion of the second vaccine series.

Please complete the serologic testing results below, or fax me a copy of the child's lab slip to me at YOUR FAX NUMBER.

Post vaccination serology drawn at 1-2 months after the final dose of vaccine:

☐HBsAg Results _____

☐Quantitative anti-HBs Results _____

If the child fails to seroconvert after the second series of vaccine, and is HBsAg negative, they should be considered susceptible to HBV infection. Council the parents or guardians regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis if any known or probable parenteral exposure to HBsAg-positive blood (CDC Pink Book, 9th Edition)

If you have any questions regarding the Iowa Perinatal Hepatitis B Prevention Program please contact me at YOUR NUMBER or the state coordinator, Bridget Konz, RN at 1-800-831-6293 ext. 7.

Sincerely,

YOUR NAME
Perinatal Hepatitis B Prevention Program
YOUR AGENCY

Letter to Postmaster Regarding Last Known Address

ADD YOUR LETTERHEAD

Date

US Postmaster
Address of Main Post Office
City of Question

Dear Postmaster:

YOUR AGENCY NAME has been working with the following individual, ADD MOM'S NAME, with a last known address of:
LIST ADDRESS HERE

We have been unable to contact this individual and would like your assistance in determining whether they may have moved to a different address. If known, please provide our agency with an updated address for this individual in the section below.

Forwarding Address:

A stamped, self-addressed envelope has been provided for your convenience. Thank you for your time and assistance. Please feel free to contact me at YOUR NUMBER if you have any questions about this letter.

Sincerely,

YOUR NAME
YOUR AGENCY NAME

IOWA
Immunization Program

Iowa Department of Public Health
Bureau of Disease Prevention and Immunization

Perinatal Hepatitis B Carrier Follow-Up Report

Bethany Kintigh,RN, BSN Perinatal Hepatitis B Coordinator
(515) 281-7228 or 1-800-831-6293 (extension #7)
FAX 1-800-831-6292
Bethany.Kintigh@idph.iowa.gov

Person Completing form:_____

Date Faxed:_____

This form is designed to facilitate the follow-up of a Perinatal Hepatitis B case. The follow-up consists of determining if the patient is pregnant, confirming the delivery, assuring appropriate care for the infant as well as gaining information on susceptible household contacts. Please complete and fax to 1-800-831-6292.

I. Screening Data (Mother)

Name _____ DOB _____

Address _____ City/State/ Zip _____

County _____ Pt. Phone _____

Race/Ethnicity:
☐ Asian/Pacific Islander
☐ American Indian/ Alaskan Native
☐ Black/ African American
☐ Hispanic/ Latino
☐ White
☐ Other _____
☐ Unknown

Is the client foreign born ☐ Yes ☐ No

If yes, country of origin: _____

Is the client English speaking? ☐ Yes ☐ No

If no, what language? _____

Following Physician _____ Phys Phone _____

Clinic Name _____ Phys Fax _____

Address _____ City/State/ Zip _____

Is the patient pregnant? ☐ Yes ☐ No ☐ Aborted spontaneous, elected, or medically indicated

Anticipated Date of Delivery _____

Anticipated Delivery Hospital _____

Address of Hospital _____ Phone _____

City/State/Zip _____

HBsAg Test Results ☐ Positive ☐ Negative Date Tested _____

When was mother tested (check one): ☐ Pre-preg. ☐ 1st Trimester ☐ 2nd Trimester ☐ 3rd Trimester ☐ At Delivery

II. Immunization/Prophylaxis/Follow-up on Infant (complete separate forms for multiple births)

Infant's Name _____ Sex ☐ Female ☐ Male

Race/Ethnicity: ☐ Asian/Pacific Islander ☐ American Indian/ Alaskan Native ☐ Black/ African American ☐ Hispanic/ Latino ☐ White ☐ Other ☐ Unknown

Date and Time of Birth: _____ Birth Weight _____

Date HBIG Given _____ Given Within 12 Hours of Birth? ☐ Yes ☐ No

HBV Given Dose 1 _____ Dose 2 _____ Dose 3 _____ Dose 4 _____

Infant on IRIS: ☐ Yes ☐ No Vaccine Used for Series: Comvax ☐ Pediarix ☐ Hep. B only ☐

Infant's Health Care Provider _____ Phone _____

Clinic Name _____ Fax _____

Address _____ City/State/Zip _____

III. Post-Vaccination Infant Serology (recommended 3-9 months after final dose of Hep B vaccine; generally at 12 months of age)

HBsAg Testing Date: _____ ☐ Positive ☐ Negative ☐ Not Tested

Anti-HBs Testing Date: _____ ☐ Positive ☐ Negative Value: _____ ☐ Not Tested

Comments:

IV. Summary of All Household Contacts

Contact's Name: ______________________ DOB ______________________ Sex: ☐ Male ☐ Female

Serologic Testing: HBsAG Result: ☐ Positive ☐ Negative Date ______________

Anti-HBc Result Value ______________ Date ______________

Dates Hepatitis B Vaccine Given: ☐ Hepatitis B Only ☐ Combination (Twinrix, Comvax, Pediarix) Entered into IRIS? ☐ Yes ☐ No

Dose 1 ____________ Dose 2 ____________ Dose 3 ____________ Dose 4 ____________

Contact's Name: ______________________ DOB ______________________ Sex: ☐ Male ☐ Female

Serologic Testing: HBsAG Result: ☐ Positive ☐ Negative Date ______________

Anti-HBc Result Value ______________ Date ______________

Dates Hepatitis B Vaccine Given: ☐ Hepatitis B Only ☐ Combination (Twinrix, Comvax, Pediarix) Entered into IRIS? ☐ Yes ☐ No

Dose 1 ____________ Dose 2 ____________ Dose 3 ____________ Dose 4 ____________

Contact's Name: ______________________ DOB ______________________ Sex: ☐ Male ☐ Female

Serologic Testing: HBsAG Result: ☐ Positive ☐ Negative Date ______________

Anti-HBc Result Value ______________ Date ______________

Dates Hepatitis B Vaccine Given: ☐ Hepatitis B Only ☐ Combination (Twinrix, Comvax, Pediarix) Entered into IRIS? ☐ Yes ☐ No

Dose 1 ____________ Dose 2 ____________ Dose 3 ____________ Dose 4 ____________

Number of household contacts identified? __________

Number of contacts tested for anti-HBc? __________ # of positives __________

Number of contacts tested that were susceptible (neg for anti-HBc, neg for HBsAg, neg for anti-HBs)?__________

Number of contacts lost to follow-up or not tested? __________

Comments (include reasons for non-compliance or not testing and possible risk factors):

Reminders for Vaccination and Testing

At birth

- Infants born to mothers who are HBsAg positive should receive hepatitis B vaccine and hepatitis B immune globulin (HBIG) within 12 hours of birth.
- Infants born to mothers whose HBsAg status is unknown, who are greater than 2,000g (4.4 lbs) at birth, should receive hepatitis B vaccine (HBV) within 12 hours after birth. Infants weighing less than 2,000g at birth should receive HBIG concurrently with HBV vaccine but at a separate site. The mother should have blood drawn as soon as possible to determine her HBsAg status; if she is HBsAg positive, the infant should receive HBIG as soon as possible (no later than age 1 week).
- Full-term infants who are medically stable and weigh greater than 2,000 g born to HBsAg-negative mothers should receive single-antigen hepatitis B vaccine before hospital discharge – Birth dose.
- Preterm infants weighing less than 2,000 g born to HBsAg-negative mothers should receive the first dose of vaccine 1 month after birth or at hospital discharge.

After the birth dose

- All infants should complete the hepatitis B vaccine series with either single-antigen vaccine or combination vaccine, according to a recommended vaccination schedule. Infants born to HBsAg positive mothers should complete vaccination by 6 months of age.
- Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg 3-9 months after HBV vaccine completion.

Post-vaccination testing for anti-HBs and HBsAg should be performed 3-9 months after the final dose of HBV vaccine (generally at the 12 month well-child visit). Testing should not be performed before age 9 months to avoid detection of anti-HBs from HBIG administered during infancy and to maximize the likelihood of detecting late HBV infection. Anti-HBc testing of infants is not recommended because passively acquired maternal anti-HBc might be detected in infants born to HBV infected mothers to age 24 months.

Source: MMWR, Vol. 54/No. RR-16/ December 23, 2005

**If needed, the Iowa Department of Public Health can supply the hepatitis B vaccine and Hepatitis B Immune Globulin for the baby.

IOWA
Immunization Program

Iowa Department of Public Health
Bureau of Disease Prevention and Immunization

Perinatal Hepatitis B Hospital Report

Please complete the information that applies and FAX to: Bethany Kintigh RN, BSN Perinatal Hepatitis B Coordinator
Questions: Please call: 1-800-831-6293 ext. 7 Fax: 1-800-831-6292

For Women known to be HBsAg Positive	For Women whose HBsAg status is Unknown
☐ Administer hepatitis B immune globulin (HBIG) and Hepatitis B vaccine within 12 hours of birth.	☐ Perform stat HBsAg screening for all women admitted for delivery whose status is unknown.
☐ If your hospital is having difficulty obtaining HBIG please call IDPH at 1-800-831-6293.	☐ While test results are pending, administer hepatitis B vaccine within 12 hours of birth. If the mother is later found to be positive, her infant should receive the additional protection of HBIFG as soon as possible and before the infant is discharged, HBIG must be given within 7 days of birth.

Name of Hospital: _____ Date Sent: _____

City of Hospital:_____ Mothers Hospital Record #:_____

Note: Only report if mother is HBsAg Positive.

Mothers Information	HBsAg(+) Test Date (if done in hospital)*
First Name	Last Name
Date of Birth:	Phone:
Address:	EDC:
City/Zip:	Alternate Phone (i.e. relative):
Physician's Name:	Clinic Name:
Race: ☐ Asian/Pacific Islander ☐ American Indian/ Alaskan Native ☐ Black/ African American ☐ Hispanic/ Latino ☐ White ☐ Other _____ ☐ Unknown	Is the client foreign born ☐ Yes ☐ No If yes, country of origin: _____ Is the client English speaking? ☐ Yes ☐ No If no, what language? _____

*Please send a copy of the labs with this form.

Infant's Information	Hospital Record #:
First Name	Last Name
Date of Birth:	Birth weight: Sex: ☐ Male ☐ Female
Date of HBIG	Date of HBV Vaccine:
HBIG given within 12 Hours of Birth ☐ Yes ☐ No	Child entered into IRIS ☐ Yes ☐ No

IMPORTANT

Clinic where baby will receive next dose of vaccine _____

Infant's Physician Name and Phone:_____

Iowa Department of Public Health
Bureau of Disease Prevention and Immunization
321 East 12th Street / Lucas State Office Bldg./ Des Moines IA 50319
http://www.idph.state.ia.us/adper/immunization.asp

For More information Please Call: 1-800-831-6293, ext 7

Form: 12-1-2006

HBsAg+ Exposed Infants Follow-Up Checklist

Prior to Delivery:

- ❑ Contact the mother's provider. Make sure they are aware of her HBsAg positive lab result, the indicated immunoprophylaxis (HBIG) for the infant, and provide the brochure "Perinatal Hepatitis B Providers Guide."

- ❑ Contact the hospital or delivery center to make sure that they will have HBIG on hand and that the mother's HBsAg status is noted in her prenatal record.

- ❑ Prior to delivery, call, write, or make a home visit to the client and provide perinatal hepatitis B educational materials (including the "Hepatitis B and Moms-to-B Brochure").

- ❑ Complete Section I of the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form" with demographic information on mom. Educate the client on how to reduce risk of transmission of hepatitis B to her infant and household members.

- ❑ Complete Section IV on the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form". Identify susceptible household contacts (children and sexual contacts) and encourage them to be tested and vaccinated.

After Delivery:

- ❑ Complete Section II of the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form" with the infant's birth date and dates for HBIG and the 1st dose of vaccine.

- ❑ Notify the client's pediatric provider of the mother's positive HBsAg status and remind them that the infant should receive the 2nd dose of vaccine at one to two months and the 3rd dose of vaccine at 6 months of age as well as post-vaccination serology at 12 months of age. Make follow-up calls or visits with the client to make sure that her baby has gone in for his/her vaccinations and serology test.

- ❑ At 12 months of age, collect post-vaccination serology results. Be sure the provider tests for both HBsAg and Anti-HBs. Complete Section II of the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form."

- ❑ If infant doesn't develop an antibody response to the HBV vaccine and remains negative for hepatitis B infection, call the clinic or fax/send a request to ensure that a second series of HBV vaccine is given.

- ❑ Complete the IDPH "Perinatal Hepatitis B Carrier Follow-Up Report Form" with all shot dates and test results and fax/send to IDPH.

Periodically update the Perinatal Hepatitis B Prevention Program with your progress at the following intervals:

- After Section I is completed for mom and household contacts have been identified (Section IV)
- After contacts have completed the first does in the series, or had serology to indicate no vaccine is needed (Section IV).
- After the baby is born and HBIG and birth dose of vaccine have been given.
- Upon completion of each dose of vaccine in the series for newborn and contacts.
- Upon completion of serology for infant and closing of case.

Please send results by fax (1-800-831-6292) or e-mail Bethany.Kintigh@idph.iowa.gov or to:
Bethany Kintigh, RN, BSN IDPH Immunization Program, 321 East 12th Street, Des Moines, IA 50319

Appendix 4 General Information for Patients

Appendix 4 links:
Frequently Asked Questions About Hepatitis B: www.immunize.org/catg.d/p4090.pdf
Hepatitis B Vaccine VIS: www.cdc.gov/vaccines/pubs/vis/default.htm#hepa

Appendix 5 General Information for Providers

Appendix 5 links:
Guidelines for Standing Orders: www.immunize.org/catg.d/p2130.pdf
Sample Standing Orders: www.immunize.org/catg.d/p3076a.pdf

Appendix 6 Hepatitis B Chapter from the CDC Pink Book

Appendix 6 links:
CDC Pink Book Chapter on Hepatitis B: www.cdc.gov/vaccines/pubs/pinkbook/downloads/hepb.pdf

Appendix 7 Iowa Administrative Code 614, Chapter 1

Appendix 7 links:
Iowa Administrative Code Chapter 641.1: www.legis.state.ia.us/Rules/Current/iac/641iac/6411/6411.pdf

Appendix 8 MMWR December 23, 2005

Appendix 8 links:
MMWR: Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States: www.cdc.gov/mmwr/PDF/rr/rr5416.pdf

Appendix 9 Hepatitis B Chapter from IDPH Epidemiology Manual

Appendix 9 link:
IDPH EPI Manual – Hepatitis B Chapter:
www.idph.state.ia.us/idph_universalhelp/main.aspx?system=IdphEpiManual

HEPATITIS C

Also known as Non-A Non-B Hepatitis, HCV Infection

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physician: Report by IDSS, facsimile, mail or phone
Local Public Health Agency (LPHA): Followup dependent on local agency protocol

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Hepatitis C is caused by an RNA virus (in the *Flaviviridae* family). Multiple hepatitis C virus (HCV) genotypes exist, with type 1 being most common in the United States.

B. Clinical Description

Hepatitis C is a disease with varying rates of progression. In general, its course is slowly progressive. For people who are recently infected, only 20% - 30% will experience any related acute symptoms. Therefore, it is uncommon for people to be diagnosed with HCV infection in the acute stage. About 15% of HCV-infected individuals completely recover spontaneously (reasons for this are still unknown), however the remainder develops chronic infection.

Most people are asymptomatic during the first decade or two of chronic hepatitis C. Some patients will experience a range of symptoms including fatigue, headaches, joint aches, muscle aches, nausea, jaundice, loss of appetite, and/or abdominal pain. Of those chronically infected, about 20% eventually develop cirrhosis or cancer of the liver [hepatocellular cancer (HCC)]. Cirrhosis can lead to liver failure in some people and predispose them to the development of liver cancer. The progression chart (under Hepatitis C in the Epi Manual) illustrates the natural history of hepatitis C. Factors related to more serious clinical outcomes include drinking alcohol, coinfection with hepatitis A, hepatitis B, or HIV, and taking medications or food supplements that harm the liver.

Treatment of chronic hepatitis C with pegylated interferon with or without ribavirin is indicated for some individuals and may result in a sustained response with elimination of virus in up to 50% - 80% of those receiving a full 6 - 12 months of treatment.

C. Reservoirs

Infected humans are the only known source of this disease.

D. Modes of Transmission

Hepatitis C is a bloodborne pathogen; it is predominantly spread via percutaneous exposure to infectious blood or blood products. Currently, the most prevalent mode of transmission is sharing needles or syringes to inject illicit drugs. Blood transfusions pose an extremely limited risk today, but for those patients who received a blood transfusion prior to July 1992, the risk was approximately 1 in 200 transfused units. Sexual and vertical (mother to infant) transmission of hepatitis C does occur, but does not appear to be an efficient mode of transmission. Other potential risks for transmission include long-term hemodialysis, occupational blood exposure, and tattooing or body piercing with non-sterilized equipment. Hepatitis C is not spread via casual contact, kissing, sneezing, hugging, breast milk, or sharing glasses or utensils.

E. Incubation Period

The incubation period for hepatitis C ranges from 2 weeks to 6 months, with an average incubation period of 6 - 9 weeks.

F. Infectious Period

Infectiousness with HCV is variable; anyone with a positive test for HCV antibody should be considered infectious until more extensive testing can be done to rule out the presence of the virus in the blood. The virus can usually be detected in an infected person's blood within 1 - 3 weeks after the initial exposure. The degree of correlation between quantity of circulating virus and infectiousness is not clearly established.

G. Epidemiology

Hepatitis C has a worldwide distribution. In the United States an estimated 3-4 million people are infected with HCV. It is thought that there are currently about 17,000 new cases of hepatitis C infection each year. HCV infection occurs among persons of all ages, with the highest incidence of acute hepatitis C (new cases) occurring among persons aged 20 - 39 years. Prevalence is highest among groups with specific risk factors, especially injection drug users, patients with hemophilia or on long-term hemodialysis, prisoners, and people who received blood or organ products prior to July 1992. HCV infection is highly prevalent (50% – 95%) among injection drug users (IDUs) and rapidly acquired after drug users first inject drugs. Several studies have now shown that HCV transmission among IDUs is associated with both direct and indirect sharing of injection equipment such as cookers and cotton. The risk of occupational exposure for healthcare workers has been estimated to be 1.8% per incident of hollow-bore needle stick exposure to HCV-infected blood. Perinatal transmission is estimated as being about 5%, although if the mother is coinfected with HIV, the risk may be increased to approximately 15%.

Hepatitis C is a reportable disease in Iowa. The majority of newly reported cases are not people with new (acute) disease, but those with chronic infection. There is a large population of undiagnosed people who were infected in the past.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To provide information to HCV-infected persons on how to prevent exposing others.
- To identify HCV-infected patients to ensure that they are educated on the need for medical evaluation, how to reduce disease progression, and to provide referrals to medical or support services.
- To determine the prevalence of HCV in specific populations and geographic locations to better direct HCV prevention and service activities.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report cases of hepatitis C. Report any case with a positive result on any of the following tests:

- EIA (ELISA) HCV antibody
- RIBA
- Viral RNA by RT-PCR or bDNA
- Genotype testing

Note: Please feel free to consult with the Adult Viral Hepatitis Prevention Coordinator at the Bureau of HIV, STD, and Hepatitis at (515) 281-5027 for assistance in interpreting laboratory results or if you have any other questions regarding a case of hepatitis C infection.

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The State of Iowa University Hygienic Laboratory (SHL) does not provide routine HCV antibody testing for the general public. Testing is generally conducted through hospital and commercial clinical laboratories. Some county health departments are currently offering the HCV EIA antibody test. Please contact the Adult Viral Hepatitis Prevention Coordinator at the Bureau of HIV, STD, and Hepatitis at (515) 281-5027 for the listing of county health departments offering this service.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

No restrictions except for exclusion from organ and blood donation and counseling to modify activities in order to prevent transmission.

Note: Sexual transmission of hepatitis C does occur, but is infrequent.

Minimum Period of Quarantine of Contacts

None

B. Protection of Contacts of a Case

Personal surveillance for high-risk contacts is recommended. Personal surveillance is defined as the practice of close medical or other supervision of contacts without restricting their movements in order to promote recognition of infection or illness.

Standard Precautions for cases are recommended to prevent exposing others to blood and body fluids. Immune Globulin prophylaxis is not effective and is not recommended for those exposed to HCV-infected individuals, such as healthcare workers who receive a needle stick with a contaminated needle.

C. Managing Special Situations

There are no specific regulations regarding HCV infection in child care settings, food service environments, or in schools or community residential programs. HCV is not spread via casual contact or through food or water. As long as Standard Precautions are maintained, HCV will not be spread to others in these settings. No one who is HCV-infected should be excluded from attending or working in any of these settings on the basis of their HCV infection.

D. Preventive Measures

The role of the local health department in managing hepatitis C is largely educating infected persons how to care for themselves and avoid spreading infection to others. Little epidemiologic investigation is required except data collection for case reports. Prevention and education includes information on how the disease is transmitted, how to avoid transmitting it, and how patients can protect themselves from more liver damage. Offer the information and support below to newly identified cases.

1. Provide basic instruction on transmission of HCV and emphasize the need for ongoing medical evaluation. Treatment is available and the patient should be referred to their healthcare provider for treatment options.
2. If the patient is a current injection drug user, provide referrals to needle access and disposal programs and drug treatment programs. This will help prevent the spread of hepatitis C to other individuals.
3. Educate on the need to completely abstain from alcohol to help protect the liver. If a patient needs or wants support to stop drinking, provide referrals to appropriate treatment or support services.
4. Discuss medications that should be avoided (*e.g.,* acetaminophen) as high doses of certain medications can damage the liver. All patients should discuss any medications (including over-the-counter medications), dietary supplements, and herbs with a healthcare provider prior to taking them to be certain they will not damage their liver.

5. Provide information on hepatitis A and B immunization. (Refer to the Hepatitis A and B chapters in this manual.)
6. Discuss sexual transmission of HCV. Indicate that HCV may be transmitted during sex. All contact with blood during sex should be avoided. Emphasize latex barrier protection as a way to prevent the spread of HCV, as well as being a way to prevent the exposure to and transmission of other pathogens.
7. Discuss household transmission of HCV. Household transmission is rare, but to ensure that it does not happen, the patient should not share razors, toothbrushes, nail clippers, or any other item that could be contaminated with blood with other household members.
8. Inform the patient that they should not be restricted from working, preparing food, or taking part in their daily activities unless they have specific symptoms that make it difficult to do so. There are no recommendations suggesting that HCV-infected persons change their exercise routines or have any dietary restrictions.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hepatitis C can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2006.
CDC. Case Definitions for Infectious Conditions under Public Health Surveillance, 2011: www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm
CDC. Recommendations for Prevention and Control of Hepatitis C Virus (HCV) Infection and HCV-Related Chronic Disease, *MMWR*. 1998; 47:RR-19.
Chin, J., ed. *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.
National Institutes of Health. Management of Hepatitis C. *NIH Consensus Statement*. June 10-12, 2002

Resources

CDC Hepatitis C website: www.cdc.gov/hepatitis/HCV/index.htm
www.aasld.org/practiceguidelines/Documents/Bookmarked%20Practice%20Guidelines/Diagnosis_of_HEP_C_Update.Aug%20_09pdf.pdf

FACT SHEET HEPATITIS C

Acute and Carrier Information (Non A-Non B, Hep C, HCV)

What is Hepatitis C?
Hepatitis C is a virus that infects the liver.

Who is at risk for Hepatitis C?
IV drug users, persons receiving blood products (such as transfusions) or organ transplants prior to July 1992, persons receiving clotting factors before 1987, healthcare workers, chronic hemodialysis patients, infants born to infected mothers, and persons with multiple sexual partners are at risk for hepatitis C. The mode of transmission is unknown in about 10% of cases.

How do people get Hepatitis C?
The hepatitis C virus is most often spread through contact with infected blood. Sharing needles for injection drug use is a very common way people become infected. Having sex with an infected person, living in the household with someone who has hepatitis C, and being born to an infected mother are other ways people could become infected, although the risk of contracting the virus in these ways is not as common as having a blood exposure. The role of sexual transmission is not clear, but high-risk sexual activity (multiple partners or a history of STDs) is a risk factor. In 1992 a test for hepatitis C was developed and is used to screen every unit of donated blood, so that getting a transfusion is now considered safe. There is no evidence that hepatitis C can be transmitted by casual contact, through foods, or by coughing or sneezing. There is no evidence of hepatitis C being transmitted through breast milk.

What are the symptoms of Hepatitis C?
Symptoms may include being very tired, nausea, vomiting, fever, stomach pain, tea-colored urine, and yellowing of the skin and eyes (jaundice). Most people infected with hepatitis C will have only a few mild symptoms and may never know they were infected. However, all infected people can spread the virus, even when they do not feel sick. Only about 25 - 35% of infected persons will develop symptoms however.

How long can an infected person spread the virus?
The virus can be spread from one or more weeks before symptoms begin and throughout the time the person has the virus. About 15% of infected people will recover from the infection and get rid of the virus within a few weeks or months. Approximately two thirds of people infected with hepatitis C however will not get rid of the virus and will have the virus for the rest of their lives. As long as a person has the virus, that person can transmit it to other people.

How is Hepatitis C diagnosed?
Infection by the hepatitis C virus can be determined by a simple blood test that detects antibodies against HCV. Your healthcare provider may ask that additional diagnostic tests be run.

Can a blood test tell if I am no longer infected?
Other blood tests are available to check for the actual levels of the virus in the blood, and a liver biopsy could be done to determine the extent of liver damage done by the virus.

How is Hepatitis C treated?
At this time, long-acting pegylated interferon, or a combination of pegylated interferon with Ribavirin are being used to treat hepatitis C. Depending on the type of hepatitis C (genotype) a person has, treatment can last from 24-48 weeks. Effectiveness rates vary from 50-80% depending on the type of hepatitis C, as well as how well the person is able to tolerate the treatment program.

What can I do to take care of myself if I have hepatitis C?
- Avoid alcoholic beverages and street drugs. They will damage your liver.
- Avoid taking prescription or over-the-counter medicines, dietary supplements, or herbs unless your doctor tells you it is OK. Certain types of medications or supplements can damage your liver.
- Eat a healthy diet (low fat, non-spicy sometimes helps) and get plenty of rest. If you are vomiting after eating, tell your doctor.
- See your doctor and follow the doctor's instructions carefully. Your doctor will want to do blood tests occasionally to see how your liver is working.

- If you get pregnant, tell your doctor you have hepatitis C.

What can I do to protect others?

- Cover all cuts and sores with a bandage.
- Throw away all items that have your blood on them in plastic bags and close the bag tightly.
- Wash your hands well after touching your blood or body fluids.
- Clean up blood spills with paper towels. Next, clean the area with a bleach solution (1 part bleach to 100 parts water or one-quarter cup bleach per gallon of water).
- Talk with your sex partner about your hepatitis C and discuss the possibility of using a latex condom during sex. Although the risk of transmitting the virus sexually is low, it is possible to transmit hepatitis C this way.
- Do not share any items that may have your blood on them (even if you cannot see the blood), such as toothbrushes, razors, and needles used for ear-piercing, tattooing, or drug use or other drug use items.
- Do not donate blood, plasma, semen, or body organs.

FACT SHEET

HEPATITIS C

(Non A-Non B, Hep C, HCV)

What is Hepatitis C?
Hepatitis C is a virus that infects the liver.

Who is at risk for Hepatitis C?
IV drug users, persons receiving blood products (such as transfusions) or organ transplants prior to July 1992, persons receiving clotting factors before 1987, healthcare workers, chronic hemodialysis patients, infants born to infected mothers, and persons with multiple sexual partners are at highest risk for hepatitis C.

How do people get Hepatitis C?
The hepatitis C virus is spread through contact with contaminated blood. It can also be spread through close household contact. The role of sexual transmission is not clear, but high-risk sexual activity (multiple partners or history of STD's) is a risk factor. It can also be transmitted from a pregnant woman to her baby. The mode of transmission is unknown in about 10% of cases.

Can Hepatitis C be spread from person-to-person?
Yes. Several routes have been described, but the parenteral (blood to blood) route is the most common. Sexual transmission accounts for approximately 15% of all transmission, although it is not thought to be efficiently transmitted sexually. Mother to infant transmission does occur in about 5% - 6% of infant cases. There is no evidence that hepatitis C can be transmitted by casual contact, through foods, or by coughing or sneezing. There is also no evidence of hepatitis C being transmitted through breast milk.

What are the symptoms of Hepatitis C?
Most people who are infected with hepatitis C do not have symptoms and lead normal lives. Infection with hepatitis C may cause mild symptoms, which usually develop slowly and may include feeling very tired, loss of appetite, stomach pain, nausea and vomiting. Jaundice (yellow skin and eyes) does not commonly occur. Rarely, hepatitis C may result in death.

How soon do symptoms appear?
It takes from 2 weeks to 6 months (usually 6 - 9 weeks) after exposure before symptoms appear. Only about 25% - 35% of infected persons will develop symptoms however.

How long will symptoms last?
Approximately two thirds of people infected with hepatitis C will continue with chronic infection and could potentially develop symptoms related to liver disease. It is estimated that approximately 20% of those people chronically infected with hepatitis C will develop cirrhosis, with the risk of liver cancer increasing to 1-4% per year once a person has cirrhosis. About 1% - 4% of HCV infected people die due to the disease.

How is Hepatitis C diagnosed?
Infection by the hepatitis C virus can be determined by a simple and specific blood test that detects antibodies against HCV. The antibody is insufficient to provide immunity and the test does not distinguish between acute or chronic infection. If the initial test is positive, a second test should be done to confirm the diagnosis and exclude laboratory error. A liver biopsy can determine the extent of liver damage done by the virus.

How is Hepatitis C treated?
At this time, long-acting pegylated interferon, or a combination of pegylated interferon with Ribavirin are being used to treat hepatitis C. Depending on the type of hepatitis C (genotype) a patient has, treatment can last from 24 - 48 weeks. Effectiveness rates vary from 50% - 80% depending on the type of hepatitis C and how well the patient is able to tolerate the treatment program.

How can Hepatitis C be prevented?

There is no vaccine available for hepatitis C.

- Don't share IV drug needles, syringes, water or works.
- Avoid handling or sharing anything that may have the blood of an infected person on it, such as toothbrushes, razors, straws used for cocaine, needles used for piercing or tattooing, or other personal care articles.
- If you are a healthcare worker, always follow routine barrier precautions and safely handle needles and other sharps.
- A 10% solution of household bleach is believed to kill the virus, and is recommended for the cleaning up of blood spills.

Fact Sheet HEPATITIS C

Information for Health Professionals

What is Hepatitis C?

Formerly known as non-A, non-B hepatitis, hepatitis C is an RNA virus that accounts for about 20% of all cases of acute hepatitis. There are over 4 million people infected in the U.S., and over 30,000 acute new infections each year. Hepatitis C is responsible for 8-10,000 deaths per year and is the leading cause for liver transplantation in the U.S.

How is Hepatitis C transmitted?

Several routes have been described, but the parenteral route, injection drug use, needle-stick accidents, and transfusion of infected blood or blood products (especially prior to 1990), is the most common. The role of sexual transmission is not clear, but high-risk sexual activity (multiple partners, history of STD's) is a risk factor. Hepatitis C can be transmitted perinatally to about 5% - 6% of infants. Also, chronic hemodialysis is considered a risk factor. Mode of transmission is unknown in a significant number of patients. There is NO evidence that hepatitis C can be transmitted by casual contact, through foods or by coughing or sneezing.

What are the symptoms?

Patients can be completely asymptomatic. Only about 25% - 35% will develop malaise, weakness, or anorexia. Other possible symptoms include nausea, vomiting, abdominal pain, and jaundice (when the whites of the eyes and the skin turn yellow).

What is the incubation period?

The incubation period is 2 weeks to 6 months.

How is Hepatitis C diagnosed?

There are numerous blood tests, including enzyme immunoassay for HCV antibody and recombinant immunoblot assay (RIBA). HCV RNA can generally be detected in the blood within 1 - 3 weeks of exposure. Virtually all patients develop liver cell injury as shown by increased ALT levels. Liver biopsy is generally required to determine the extent of liver disease regardless of the ALT level.

What are the potential outcomes/consequences of becoming infected?

Hepatitis C is self-limited in only 15% of cases. A persistent infection develops in as many as 85% of patients with acute hepatitis C. This is due to the fact that HCV is not easily cleared by the host's immunologic defenses. The natural history of the disease differs according to geography, alcohol use, virus characteristics, and coinfection with other viruses. Fulminant, rapid liver failure is rare. Cirrhosis develops in at least 20% within two decades of onset. Risk of liver cancer (hepatocellular carcinoma (HCC)) occurs in about 1% - 5% after 20 years. Once cirrhosis develops, then the risk of HCC increases to 1% - 4% per year.

How is Hepatitis C treated?

At this time, treatment with Alpha-interferon (IFN) with Ribavirin is being used, which is considered firstline treatment for most patients. All persons with HCV should be vaccinated against hepatitis A and B. Complete abstinence from alcohol is a must.

Who should be treated?

Many factors should be considered in determining who should be treated. Contraindications to IFN include persistently normal or near-normal ALT levels, major depressive illness, cytopenias, hyperthyroidism, renal transplantation, and evidence of autoimmune disease. Active alcohol or drug use may also be a contraindication to treatment. Most contraindications are not absolute and should be decided on a case-by-case basis.

Is there a pre-exposure vaccine available as there is for Hepatitis A and B?

There is currently no available vaccine to prevent infection with hepatitis C. There is also no post-exposure prophylaxis with hepatitis C as there is for hepatitis A and B.

What is recommended for postexposure testing?
Individuals who have been or may have been exposed need baseline and 6 month testing for HCV and ALT. Any positive HCV antibody test should be followed by further confirmatory testing.

How is transmission prevented?

- Adherence to standard precautions is essential.
- HCV(+) persons should refrain from donating blood, organs, tissues, or semen.
- Safer sexual practices, such as use of latex condoms.
- In households with an HCV(+) member, sharing razors and toothbrushes should be avoided. Covering open wounds is recommended. It is NOT necessary to avoid close contact with family members or to avoid sharing meals or utensils. There is also NO evidence to justify exclusion of HCV(+) children or adults from participation in social, educational, and employment activities.
- Pregnancy is NOT contraindicated in HCV-infected individuals. There is also no evidence that breast-feeding transmits HCV from mother to baby; therefore, it is considered safe. Babies born to HCV(+) mothers should be tested for anti-HCV at one year.
- Needle exchange and other safer injection drug use programs may be of benefit in reducing parenterally transmitted diseases.

HEPATITIS D

Also known as: Viral hepatitis D, Hepatitis delta virus, Delta agent hepatitis, Delta associated hepatitis

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Responsibilities:
Hospital: Report by IDSS, facsimile, mail, or phone
Lab: Report by IDSS, facsimile, mail, or phone
Physician: Report by facsimile, mail, or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Hepatitis delta virus (HDV) is a small virus-like particle made up of a hepatitis B surface antigen and the delta antigen and a single strand of DNA. It cannot infect a cell itself; it can only replicate if there is a co-infection with hepatitis B virus (HBV). Infection with HDV can occur at the same time as HBV or can occur at a later date in a person with chronic hepatitis B.

B. Clinical Description

Symptoms: Signs and symptoms resemble hepatitis B and may be severe. These symptoms are fatigue, nausea, vomiting, fever, stomach pain, tea-colored urine, and jaundice. The infection may be self-limiting or it may progress to chronic infection. Children may have a very severe course of disease. Infection with HDV in a person with chronic hepatitis B may be misdiagnosed as a worsening of hepatitis B. One quarter to one half of fulminant cases of hepatitis B (those that are rapidly fatal) are associated with concurrent infection with HDV.

Onset: is usually sudden.

Complications: of hepatitis D are the same as that of hepatitis B. Infection can lead to rapid death from liver cell necrosis or the infection can become chronic, leaving the person a carrier of disease and may lead to cirrhosis of the liver or liver cancer.

C. Reservoirs

Humans are the only reservoir.

D. Modes of Transmission

Hepatitis D is usually spread though exposure to blood or serous fluids, often by contaminated needles or syringes, or by use of contaminated plasma derivatives such as clotting factor. The virus can also be spread sexually.

E. Incubation period

Approximately 2 to 8 weeks.

F. Period of Communicability or Infectious Period

Blood is potentially contagious during all phases of active HDV infection. Peak infectivity is probably just before onset of symptoms.

G. Epidemiology

The disease is present worldwide but the prevalence of HDV infection varies widely. It is estimated that 10 million people are jointly infected with HDV and HBV. It is found in populations where hepatitis B is endemic.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify sources and sites of transmission and to prevent spread from those sources.
- To ensure identification of infected pregnant women and to prevent perinatal transmission to their babies.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is through the Iowa Disease Surveillance System (IDSS). The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) can refer serum specimens for Hepatitis D virus testing. Information about date of collection, date of onset of symptoms, travel history, vaccination and disease history are essential for test interpretation. For additional information on submitting samples or testing, contact the SHL at (319) 335-4500 or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

1. If case has not previously been diagnosed with hepatitis B, see the description of hepatitis B for full information on case investigation.
2. Laboratory confirmation of hepatitis D infection requires anti-HepD to be positive as well as HBsAg or IgM anti-HBc positive. In most persons with HBV-HDV co-infection, both IgM antibody to HDV (anti-HDV) and IgG anti-HDV are detectable during the course of infection. However, in about 15% of patients the only evidence of HDV infection may be the detection of either IgM anti-HDV alone during the early acute period of illness or IgG anti-HDV alone during convalescence. Tests for IgM anti-HDV, HDAg and HDV RNA by PCR are only available in research laboratories
3. For all suspected or confirmed cases of hepatitis D, complete the Hepatitis B/C case investigation in IDSS.
4. If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form in IDSS with as much information as has been gathered. Select the appropriate reason under the Event tab in the Event Exception field.
5. If access to IDSS is not possible, please FAX the form to CADE at (515) 281-5698.
6. Institution of disease control measures is an integral part of case investigation. It is the responsibility of the local public health agency to understand, and, if necessary, institute the control guidelines listed below. These are more fully outlined in the hepatitis B section.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Same as hepatitis B: No exclusion of cases is required except for exclusion from organ and blood donation and counseling to prevent transmission.

B. Protection of Contacts of a Case

See recommendations for hepatitis B. Preventing infection with hepatitis B will prevent hepatitis D for those not infected with hepatitis B. Administration of hepatitis B immune globulin (HBIG) and hepatitis B vaccine will not protect against hepatitis D in those already infected with hepatitis B.

C. Managing Special Situations

1. Percutaneous or permucosal exposure to Hepatitis B and D virus

Follow guidelines for postexposure prophylaxis for hepatitis B in hepatitis B section.

2. Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in your local area is higher than usual, or an outbreak is suspected, investigate clustered cases to determine source of infection. If evidence indicates a common source, appropriate control measures should be instituted. Consult with the epidemiologist on call at CADE at (800) 362-2736 for assistance in investigation and control measures.

D. Preventive Measures

The best way to prevent HDV infection is to prevent infection with hepatitis B. Immunization with hepatitis B vaccine will also prevent infection with hepatitis D if a person is not already infected with hepatitis B. The only way to prevent HDV infection for those already infected with hepatitis B is to avoid contact with blood and serous fluid, to never share needles for drug use, ear piercing, tattooing or other purpose, and to use condoms when having sex. The use of hepatitis B immune globulin, (HBIG), immune globulin (IG) or hepatitis B vaccine will not protect people against hepatitis D in those who are infected with chronic hepatitis B infection.

See hepatitis B section for information on immunization against hepatitis B.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hepatitis D can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.
CDC website. Hepatitis D available at: www.cdc.gov/hepatitis/hdv/index.htm
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 20th Edition.* Washington, DC, American Public Health Association, 2015.

Additional Resources

www.cdc.gov/hepatitis/index.htm

FACT SHEET HEPATITIS D

(Viral hepatitis D, Hepatitis delta virus, Delta agent hepatitis, Delta associated hepatitis)

What is hepatitis D?
Hepatitis D is a virus that infects the liver. Hepatitis D, or Delta hepatitis, is always associated with a hepatitis B infection. A person may recover from Delta hepatitis or it may progress to chronic hepatitis.

Who gets hepatitis D?
Hepatitis D can only occur if the person has hepatitis B. Hepatitis D virus (HDV) and hepatitis B virus (HBV) may infect a person at the same time or HDV infection may occur in persons with chronic HBV infection.

How is the virus spread?
The hepatitis D virus is spread by exposure to blood and serous body fluids, contaminated needles and syringes, and via sexual transmission.

What are the symptoms?
Onset of hepatitis D is usually sudden. Symptoms include tiredness, nausea, vomiting, fever, stomach pain, tea-colored urine, and yellowing of the skin and eyes (jaundice). Hepatitis D infection in someone with chronic hepatitis B may be misdiagnosed as a worsening of chronic hepatitis B.

How soon do the symptoms appear?
Symptoms occur approximately 2 - 8 weeks after infection.

How long can an infected person spread the virus?
A person can spread the virus as long as it remains in their blood. The highest risk of exposure occurs just before the onset of acute illness.

How is hepatitis D diagnosed?
A blood test is used to detect infection with the hepatitis D virus.

Can a person get hepatitis D again?
If antibodies develop, one infection with the hepatitis D virus protects a person from getting it again. Since there are different kinds of hepatitis, infection with hepatitis D will not stop a person from getting other types of hepatitis.

What is the treatment for hepatitis D?
There is no specific treatment that can make the infection go away. People who are sick with hepatitis D should see a doctor for advice about how to control their symptoms.

What can be done if a person comes into contact with someone infected with hepatitis D?
If the person does not have hepatitis B, they will not get hepatitis D. If the person has hepatitis B there is nothing that can be done to protect the person from hepatitis D. Hepatitis B immune globulin (HBIG), immune globulin (IG) and hepatitis B vaccine do not protect hepatitis B carriers from infection by HDV.

How can infection with hepatitis D be prevented?
Never share needles for drug use, ear piercing, tattooing, or any other purpose. Avoid contact with the blood or wound drainage of any other person. Use condoms when having sex.

Is there a vaccine to prevent hepatitis D?
Yes, there is a vaccine to protect against hepatitis D. For those persons not previously infected with hepatitis B the hepatitis B vaccine will protect them. This works by protecting against hepatitis B, which in turn protects against HDV. Protection is given because only people infected with hepatitis B virus can become infected with hepatitis D virus.

Hepatitis E

Agency: ____

Investigator: ____ Phone number: ____

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ____
First and middle name: ____
Maiden name: ____ Suffix: ____
Address line: ____
Zip: ____ City: ____
State: ____ County: ____
Phone: ( )- - Type: ____
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ____

Date of Birth: / / Estimated? ☐ Age: ____
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ____
Parent/Guardian phone: ( )- - Type: ____

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ____
Exposure setting: ____
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom: ____
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ____ Country: ____

Healthcare provider information

Last name: ____
First name: ____
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ____
Address line 1: ____
Address line 2: ____
Zip code: ____ City: ____
State: ____ County: ____
Phone : ( )- - Type: ____

LABORATORY FINDINGS

Laboratory: ____ Accession #: ____ Collection date: / /
Date received: / / Specimen source: ☐ Blood/serum ☐ Other Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: ____ Result: ☐ Positive ☐ Negative ☐ Not done
Organism: **Hepatitis E virus**

Laboratory: ____ Accession #: ____ Collection date: / /
Date received: / / Specimen source: ☐ Blood/serum ☐ Other Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: ____ Result: ☐ Positive ☐ Negative ☐ Not done
Organism: **Hepatitis E virus**

Laboratory: ____ Accession #: ____ Collection date: / /
Date received: / / Specimen source: ☐ Blood/serum ☐ Other Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: ____ Result: ☐ Positive ☐ Negative ☐ Not done
Organism: **Hepatitis E virus**

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Jaundice: ☐ Yes ☐ No ☐ Unk Onset date: / / Date resolved: / /

Dark urine: ☐ Yes ☐ No ☐ Unk Onset date: / / Date resolved: / /

Diarrhea: ☐ Yes ☐ No ☐ Unk Onset date: / / Date resolved: / /

Other symptoms: ☐ Abdominal pain ☐ Fever ☐ Nausea ☐ Anorexia ☐ Malaise

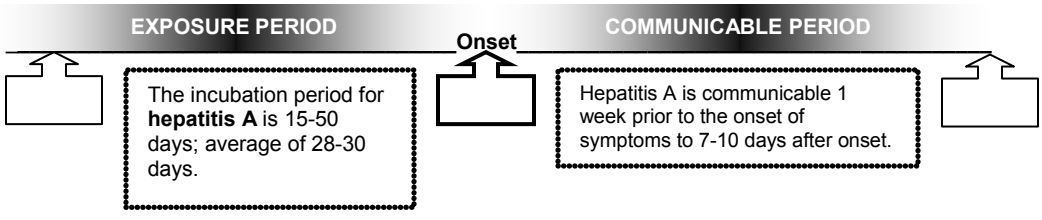
Testing reason:
☐ Elevated liver enzymes
☐ Exposure to risk factor associated with hepatitis A
☐ Exposure to someone with confirmed hepatitis A
☐ Symptoms of disease other than elevated liver enzymes
☐ Testing for immunity to hepatitis A

ALT performed? ☐ Yes ☐ No ☐ Unk Result (in IU/l): _____ Expected min (in IU/l): _____ Expected max in IU/): _____

AST performed? ☐ Yes ☐ No ☐ Unk Result (in IU/l): Expected min (in IU/l): Expected max in IU/):

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated for hepatitis A? ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:
Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:

Number of vaccinations: ____

In the 50 days prior to the onset of the symptoms did the case:

Travel within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Travel within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Travel outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Visit restaurants? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below:

Establishment name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attend Group Gatherings? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location of gathering	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Dietary Information – ***In the 50 days prior to onset of symptoms did the case consume:***

Raw shellfish: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all brand names:
List all source/types:			
Unpasteurized Mexican-style cheese: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all brand names:
List all source/types:			
Other unpasteurized products: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all brand names:
List all source/types:			
Raw fruits: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all brand names:
List all source/types:			
Raw vegetables: ☐ Yes ☐ No ☐ Unk	From dates consumed: / /	To dates consumed: / /	List all brand names:
List all source/types:			

Other Exposures – ***In the 50 days prior to the onset of symptoms did the case:***

Wear diapers: ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unknown

Do street drugs or inject steroids: ☐ Yes ☐ No ☐ Unk

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

CONTACTS

Number of people living in case's household: _____ **Close contacts with the case and/or same exposures**? ☐ Yes ☐ No ☐ Unk

Close contacts of case or close contacts with same exposures

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

		Immune globulin		Hep A vaccine	
Documented history of hepatitis A/E disease?	☐ Yes ☐ No ☐ Unk		Contact wt:		Date vaccinated: / /
Received IG within 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Date given: / /		Vaccine manufacturer:
Previously vaccinated for hepatitis A?	☐ Yes ☐ No ☐ Unk		Dose: Unit:		Vaccine type:
Vaccinated for hepatitis A w/in 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Route:		Number of vaccinations:

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

		Immune globulin		Hep A vaccine	
Documented history of hepatitis A/E disease?	☐ Yes ☐ No ☐ Unk		Contact wt:		Date vaccinated: / /
Received IG within 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Date given: / /		Vaccine manufacturer:
Previously vaccinated for hepatitis A?	☐ Yes ☐ No ☐ Unk		Dose: Unit:		Vaccine type:
Vaccinated for hepatitis A w/in 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Route:		Number of vaccinations:

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

		Immune globulin		Hep A vaccine	
Documented history of hepatitis A/E disease?	☐ Yes ☐ No ☐ Unk		Contact wt:		Date vaccinated: / /
Received IG within 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Date given: / /		Vaccine manufacturer:
Previously vaccinated for hepatitis A?	☐ Yes ☐ No ☐ Unk		Dose: Unit:		Vaccine type:
Vaccinated for hepatitis A w/in 14 days of exposure?	☐ Yes ☐ No ☐ Unk		Route:		Number of vaccinations:

HEPATITIS E

Also known as: Viral hepatitis E, Enteric non-A non –B hepatitis, "A-like" non-A non-B hepatitis

Responsibilities:
Hospital: Report by IDSS, facsimile, mail, or phone
Lab: Report by IDSS, facsimile, mail, or phone
Physician: Report by facsimile, mail, or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Hepatitis E virus (HEV) is a spherical, nonenveloped, single-stranded RNA virus. It is classified in the Heperviridae family.

B. Clinical Description

Symptoms: Signs and symptoms resemble hepatitis A. These symptoms include fever, malaise, anorexia, nausea and abdominal pain followed by jaundice. The severity can range from a mild illness lasting 1 - 2 weeks to severe disease lasting several months. It has a relatively low case-fatality rate (≤4%), which increases with age. Unlike hepatitis A, the fatality rate in pregnant women can be 10-30%, particularly those in their third trimester.

Onset is usually sudden.

Complications of hepatitis E are uncommon. There is no evidence of a chronic form.

C. Reservoirs

Humans are the only known reservoir, however, domestic animals, including pigs, may be a reservoir.

D. Modes of Transmission

Hepatitis E is usually spread through the fecal-oral route. Contaminated water is the most commonly documented route. Fecal-oral transmission probably also occurs person to person. Recent studies show that hepatitis E may be a zoonotic infection.

E. Incubation period

The range is 15 - 64 days; mean incubation period has ranged from 26 - 42 days in recent outbreaks.

F. Period of Communicability or Infectious Period

This period is unknown. HEV has been detected in stool 14 days after onset of jaundice, and 4 weeks after ingestion of contaminated food or water, persisting for 2 weeks.

G. Epidemiology

Outbreaks and sporadic cases have occurred over a wide geographic area, primarily in countries with poor sanitation. Highest rates of disease occur in young to middle-aged adults; younger age groups

may have disease without jaundice or be asymptomatic. Hepatitis E is believed to be uncommon in the United States. When HEV infection does occur, it is usually the result of travel to a developing country where Hepatitis E is endemic.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify sources and sites of transmission and to prevent spread from those sources.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) can refer serum specimens for Hepatitis E virus testing. Accurate information about date of collection, date of onset of symptoms, travel history, vaccination and disease history are essential for test interpretation. For additional information on submitting samples or testing, contact the State Hygienic Laboratory at (319) 335-4500.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

1. Verify the diagnosis.
    a. Diagnosis of hepatitis E requires clinical illness similar to viral hepatitis A (elevated liver enzymes and or jaundice or dark urine plus at least 2 other symptoms including nausea, vomiting, fever, diarrhea, or malaise with abrupt onset).

    AND

    b. A history of travel out of the country to an underdeveloped country or a country known to have endemic or epidemic hepatitis E.

    AND

    c. The patient is not known or suspected of having risk factors for hepatitis B or C.

    AND

    d. The hepatitis lab profile is negative for anti HAV-IgM, negative for HBsAg and if performed, negative for anti-HCV.
2. For all cases of hepatitis E, complete the Hepatitis E Case Investigation form in IDSS.
3. If several attempts have been made to obtain case information, but have been unsuccessful (e.g., the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Select the appropriate reason under the Event tab in the Event Exception field.

4. Complete the IDSS case investigation form. If IDSS is unavailable after completing the form, place the form in an envelope marked "Confidential" to the Center for Acute Disease Epidemiology. The mailing address is:
   IDPH, CADE
   Lucas State Office Building, 5th Floor
   321 E. 12th Street
   Des Moines, IA 50319-0075
5. Make appropriate recommendations for preventing the spread of illness. See below.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Same as hepatitis A. Enteric precautions should be used until 2 weeks following onset of jaundice.

B. Protection of Contacts of a Case

Immune globulin is not effective for protecting household or close contacts. Persons with hepatitis E should not prepare foods for others for 14 days after onset of jaundice.

C. Managing Special Situations

If the case is a food handler, child care or healthcare provider, or has potentially exposed a group of individuals in a setting where good hygiene might be questionable, such as on a camping trip, contact CADE (800) 362-2736 immediately for advice.

D. Preventive Measures

The best way to prevent hepatitis E is to prevent exposure to contaminated water or other sources of fecal contamination when traveling to endemic areas. The use of immune globulin prepared from donors from the United States or Europe is not likely to provide protection from infection

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hepatitis E can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.
CDC Website: www.cdc.gov/hepatitis/ChooseE.htm
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Additional Resources

www.cdc.gov/ncidod/diseases/hepatitis/

FACT SHEET HEPATITIS E

What is Hepatitis E?
Hepatitis E (HEV) is a liver disease caused by the hepatitis E virus (HEV). Hepatitis E, however, does not occur often in the United States.

Who is at risk for Hepatitis E?
Mostly people who travel to developing countries that have inadequate environmental sanitation.

How do you get Hepatitis E?
HEV is transmitted primarily by the fecal-oral route. Fecally contaminated drinking water is the most commonly documented method of transmission.

How long can an infected person spread the virus?
Not known. It is believed to be up to 2 weeks.

What are the symptoms of Hepatitis E?
Typical symptoms of acute hepatitis E include abdominal pain, anorexia, dark urine, fever, enlarged liver, jaundice, tiredness, nausea, and vomiting.

How soon do the symptoms appear?
Symptoms can appear between 15 – 64 days after infection.

How is hepatitis E diagnosed?
Specific blood tests are needed to diagnosis hepatitis E.

Can a person get hepatitis E again?
This is unknown at this time.

What is the treatment for hepatitis E?
Supportive care only. The person usually gets well without treatment.

Is there a vaccine to prevent hepatitis E?
No

How can Hepatitis E be prevented?
Travelers to areas where HEV is found should drink only bottled or boiled water or carbonated (bubbly) drinks in cans or bottles. Avoid tap water, fountain drinks, and ice cubes if water purity is unknown. Also avoid uncooked shellfish, and uncooked fruit/vegetables not peeled or prepared by traveler.

Human Immunodeficiency Virus (HIV)

Also known as: HIV/AIDS, Acquired Immune Deficiency Syndrome (AIDS)

Responsibilities:

Hospital: Report cases, deaths of persons with HIV/AIDS, and births by HIV-infected women by mail or phone

Lab: Report results of positive HIV detection tests, cultures, viral loads (any level, including less than the detectable limits of the test), and CD4+ cell counts (any level) by mail or secure electronic transmission.

Physician: Report all new patients and HIV diagnoses, AIDS diagnoses, and deaths of persons with HIV/AIDS (from any cause) by mail or phone.

Local Public Health Agency (LPHA): Follow-up generally not required

Iowa Department of Public Health
HIV Reporting: (515) 242-5141

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

The human immunodeficiency virus is an RNA retrovirus of the lentivirus subgroup, meaning that it contains RNA as its inner core of nucleic acid. Two types of HIV have been identified: type 1 (HIV-1) and type 2 (HIV-2). Although the two types are distinct, they produce similar symptoms and disease. Type 1 predominates in the United States, and it is the most pathogenic. HIV targets and destroys CD4+ T-lymphocyte (helper or T4) cells, leaving a person vulnerable to attack by other organisms and agents, including cancer. Acquired Immune Deficiency Syndrome (**AIDS)** indicates the late manifestation of HIV infection, in which severe immunosuppression is present. A diagnosis of AIDS occurs when the CD4+ cell count falls below 200 cells/microliter or 14% of total lymphocytes, or when one of 26 indicator diseases is diagnosed.

B. Clinical Description

Symptoms: of recent HIV infection, called acute retroviral syndrome, are present in 80 – 90% of people with primary HIV infection. The syndrome is characterized by flu-like symptoms that may include fever, malaise, lymphadenopathy, pharyngitis, headache, night sweats, myalgia, and rash. These may last for 1-2 weeks. Symptoms of advanced HIV disease are variable but may include wasting, candidiasis, persistent generalized lymphadenopathy, pneumococcal and other bacterial pneumonia, Kaposi's sarcoma, and oral hairy leukoplakia.

Onset: of acute retroviral syndrome occurs 2 – 3 weeks after viral transmission, with seroconversion and recovery occurring shortly thereafter. Symptoms of advanced disease occur, on average, 8 – 10 years after infection (without treatment), but this may range from a few months to over 15 years.

Advanced disease: includes increased risk of opportunistic infections and conditions, including active tuberculosis, *Pneumocystis jiroveci* (formerly *P. carinii*) pneumonia, cervical cancer, B-cell lymphoma, disseminated histoplasmosis and coccidioidomycosis, and progressive multifocal leukoencephalopathy. Co-infection with other sexually transmitted diseases or viral hepatitis can substantially alter the course of the illness, shortening the time to diagnosis of AIDS.

C. Reservoirs

Common reservoirs: Humans are the only known reservoir.

D. Modes of Transmission

Spread is person to person through sexual contact; the sharing of HIV-contaminated needles, syringes, and injection paraphernalia; transfusion of infected blood or its components; transplantation of infected tissues or organs; or breastfeeding. Infants may become infected before, during, or after birth to an infected mother. Less than one-fourth of infants carried by infected mothers become infected. With treatment of the mother and newborn infant, this can be lowered considerably. HIV is not transmitted by casual contact, kissing, mosquitoes, or items in the environment.

E. Incubation period

The incubation period is highly variable. Antibodies can generally be detected 3 weeks to 3 months after infection. Without effective treatment, approximately 50% of infected adults will develop AIDS within 10 years. The incubation time for infants is shorter than in adults.

F. Period of Communicability or Infectious Period

The period of communicability begins shortly after transmission and continues throughout life. Epidemiological studies indicate that transmission potential is highest shortly after infection and during late stages of disease. The presence of other STDs can increase infectiousness.

G. Epidemiology

In 2013, CDC estimates that 1.2 million people are living with HIV infection and 1 in 6 people are unaware they are infected. By the end of 2012, over 1.1 million AIDS cases and over 636,000 deaths among persons with AIDS had been reported to CDC for the United States and its dependent areas. HIV infection (without an AIDS diagnosis) is now reportable by name in all 50 states. CDC estimates that approximately 50,000 persons become infected with HIV in the United States each year, and this has been relatively stable since 1990. Globally, 35.3 million people were living with HIV/AIDS in 2012 and approximately 2.3 million people become newly infected with HIV each year.

Iowa averages approximately 115 HIV diagnoses and 75 AIDS diagnoses per year. For additional information, visit: www.idph.state.ia.us/HivStdHep/HIV-AIDS.aspx?prog=Hiv&pg=HivSurv

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To monitor trends in HIV diagnoses, AIDS diagnoses, and prevalence of persons living with HIV/AIDS so that prevention and treatment funds may be targeted efficiently and prevention programs may be evaluated.
- To interrupt disease transmission chains by providing partner counseling and testing.
- To assure referral services for persons recently diagnosed with HIV infection.
- To monitor perinatal exposures to HIV infection and morbidity in infants born to HIV-infected women.

B. Laboratory and Healthcare Provider Reporting Requirements

Reportable conditions indicative of HIV infection include:

- Confirmed positive results on any HIV diagnostic test, including antibody tests, antigen tests, cultures, and qualitative polymerase chain reaction (PCR) tests.

- **All levels** of quantitative tests (viral loads), including RT-PCR, branched chain DNA, and NASBA viral load assays. Results less than the detectable limit of the test **should** be reported.
- Acquired Immune Deficiency Syndrome (AIDS) and AIDS-defining conditions.
- **All levels** of CD4+ T-lymphocyte cell counts. Values for the absolute count and the percentage of total lymphocytes should be included.
- Birth of an infant to an HIV-infected mother (perinatal exposure) or any (positive, negative, or undetectable) non-antibody detection test (antigen test, viral culture, viral load, or qualitative PCR detection test) on an infant less than or equal to 18 months of age. These are tests indicative of perinatal exposures. Negative antibody tests (EIA, immunofluorescence, or Western blot) should not be reported.
- Death of a person with HIV/AIDS, from any cause.

Physicians or other healthcare providers must report cases within 7 days of a positive HIV test; diagnosis of HIV, AIDS, or AIDS-defining conditions; or upon first examination or treatment for HIV/AIDS (for new patients who have been previously diagnosed elsewhere). Hospitals or care providers should report births of infants to HIV-infected women (i.e., perinatal exposures).

Patient demographics, laboratory information, and patient history should be reported on form CDC 50.42A for adults and adolescents (≥ 13 years of age) and form CDC 50.42B for pediatric HIV or AIDS cases and perinatal exposures to HIV. Case report forms may be obtained from the HIV/AIDS Program at (515) 242-5141.

Laboratory personnel should forward results of tests directly to the Iowa Department of Public Health. Optional, postage-paid envelopes are available at the Clearinghouse. Request "03" envelopes at (319-398-5133) or send reports to the address below.

Case report forms and laboratory results may be addressed directly to:

Iowa Department of Public Health
Bureau of HIV, STD and Hepatitis (03) Confidential
321 East 12th Street
Des Moines, IA 50319-0075

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

Partner notification and referral services will be provided by disease prevention specialists employed by the Iowa Department of Public Health, or by Black Hawk, Linn, Polk, or Scott county health departments.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

To protect future contacts, all cases receive education on prevention of further spread.

The Iowa Department of Public Health will initiate the voluntary partner notification program for all persons who are newly diagnosed with HIV infection. Healthcare providers can facilitate this process by describing the program to the patient, providing the patient with the department's brochure entitled, "Partner/Spousal Notification for HIV/AIDS," and encouraging the patient to meet with the department's disease prevention specialist assigned to his or her region.

Patients' names and times of exposures are not used in the notification of partners. HIV testing is offered to all partners free of charge and appropriate referrals to other services are provided during the partner counseling sessions. Partner notification brochures are available in English and Spanish from the Clearinghouse at (319) 398-5133.

Physicians may assist the disease prevention specialists with the collection of partner notification information. In such cases, the physician should collect the following information: Partner name, address, home phone number, age and/or date of birth, race, sex, partner/marital status, height, size/build, general description of the partner, and dates of first and last exposure. Any other information that may help in locating and counseling the partner may also be included, such as medical conditions, place of employment, cell phone numbers, or other unusual circumstances/situations.

Iowa code also allows for direct notification of an identifiable sexual or needle-sharing partner when the partner is deemed to be in imminent danger of infection and the HIV-infected client will not agree to participate in voluntary partner notification. Healthcare providers may contact the HIV/AIDS Program's surveillance office (515-242-5141) for more information or to request assistance with partner notification or the direct notification of a third party. Physicians may also notify identifiable third parties directly. The *Iowa Administrative Code* 641-11.18 outlines procedures for direct notification by physicians.

C. Managing Special Situations

Occupational Exposures in Non-clinical Settings

If a care provider (including EMT, fire fighters, peace officers, and volunteers) sustains a significant exposure to blood or other potentially infectious fluids from an individual, that individual is deemed to consent to a test to determine the presence of HIV infection (or other infectious blood-borne pathogens) upon certification of a *Report of Exposure to HIV or Other Infectious Disease* form [See *Iowa Code 139A.19* and *Iowa Administrative Code* 641-11.21 to 11.26]. The individual is also deemed to consent to notification of the care provider of the test results. These consents are contingent upon submission of a significant exposure report by the care provider and its certification by an infection preventionist or physician. [Significant exposure report forms are available from the Clearinghouse at (319) 398-5133].

The hospital or clinic to which the individual was delivered shall conduct the testing. If the individual is delivered to an institution administered by the Iowa Department of Corrections, testing shall be conducted by the staff physician of the institution. If the individual is delivered to jail, testing shall be conducted by the attending physician of the jail or the county medical examiner. The sample and test results shall only be identified by a number.

If the test results are positive, the hospital or other person performing the test shall notify the subject of the test and ensure the performance of counseling and reporting requirements in the same manner as for an individual from whom consent was obtained. The report to the department shall include the name of the individual tested along with other required demographic information. The hospital or other person performing the test shall notify the care provider or the designated representative of the care provider who shall then notify the care provider who sustained the exposure.

Occupational Exposures in Clinical Settings

If a care provider sustains a significant exposure to blood or other potentially infectious fluids from an adult patient in a clinical setting (including home-health settings), a previously signed general consent for medical care shall include testing to determine the presence of HIV (or other infectious blood-borne pathogens) and notification of the care provider of the test results. Minors should be handled in the same way as an exposure that occurred in a non-clinical setting (see above). The adult patient shall be informed of the exposure and of the test(s) performed.

If the test results are positive, the hospital or other person performing the test shall notify the adult patient of the results and ensure the performance of counseling and reporting requirements in the same manner as for an individual from whom consent was obtained. The report to the department shall include the name of the individual tested along with other required demographic information. The hospital or other person performing the test shall notify the care provider or the designated representative of the care provider who shall then notify the care provider who sustained the exposure.

Information on post-exposure prophylaxis protocols is available 24 hours a day at the National Clinicians' Post-Exposure Prophylaxis Hotline at (888) 448-4911.

Reported Incidence Is Higher than Usual/Outbreak Suspected

Report to the Iowa Department of Public Health at (515) 242-5141.

D. Preventive Measures

Preventive Measures/Education (Iowa Code 141A.4)

Testing and education shall be offered to all persons who are at risk for HIV infection. Risk factors include male-to-male sex; injection drug use; testing positive for an STD; exchange of sex for money or drugs; blood transfusion before 1986; immigration from a high-incidence country; or having a sex partner who is HIV positive or who is in one of the previous risk groups.

All pregnant women shall be tested for HIV infection as part of the routine panel of prenatal tests. A pregnant woman shall be notified that HIV screening is recommended for all prenatal patients and that the she will receive an HIV test as part of the routine panel of prenatal tests unless she declines the test. A declination shall be documented in her medical record. Information about HIV prevention, risk reduction, and treatment opportunities to reduce the possible transmission of HIV to the fetus shall be made available to all pregnant women.

Free HIV counseling, testing, and referral sites are available across the state for persons with risk factors. Visit: www.idph.state.ia.us/HivStdHep/HIV-AIDS.aspx?prog=Hiv&pg=HivPrev for a current list of places and times.

Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings

The CDC issued revised recommendations for HIV testing in health care settings in September 2006. They recommend routine opt-out testing for HIV for all patients aged 13 to 64 years of age unless the prevalence of undiagnosed HIV infection in the patient population has been determined to be less than 0.1 percent (1 per 1,000 patients). They also recommend that separate written consent for HIV testing should not be required; general consent for medical care should be considered sufficient. The full recommendations can be found at: www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm

4) ADDITIONAL INFORMATION

Consent and Education Requirements for HIV testing (Iowa Code 141A.6)

Prior to undergoing an HIV test, information concerning testing and any means of obtaining additional information regarding HIV infection and risk reduction shall be made available to the subject of the test.

Testing of Adults

If an individual signs a general consent form for the performance of medical tests or procedures, the signing of an additional consent form for the specific purpose of consenting to an HIV-related test is not required during the time in which the general consent form is in effect. If an individual has not signed a general consent form for the performance of medical tests and procedures or the consent

form is no longer in effect, a health care provider shall obtain oral or written consent prior to performing an HIV-related test. If an individual is unable to provide consent, the individual's legal guardian may provide consent. If the individual's legal guardian cannot be located or is unavailable, a health care provider may authorize the test when the test results are necessary for diagnostic purposes to provide appropriate urgent medical care.

Testing of minors

Minors have the legal capacity to act and give consent for diagnosis and treatment of sexually transmitted diseases, including HIV, without the consent of a parent, custodian, or guardian (see Iowa Code 139A.35).

Before undergoing an HIV test, however, a minor must be informed that the legal guardian will be notified by the testing facility if the test is confirmed as positive. Minors must give written consent for HIV testing and treatment services (see Iowa Code 141A.7 (3). The consent form should indicate that the minor understands that his or her legal guardian will be notified if the test is confirmed as positive.

Surveillance Case Definitions

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for HIV/AIDS can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Iowa Epidemiological Profile of HIV/AIDS and Sexually Transmitted Diseases

Visit: www.idph.state.ia.us/HivStdHep/HIV-AIDS.aspx?prog=Hiv&pg=HivSurv

References

Bartlett, J.G., and J.E. Gallant. *Medical Management of HIV Infection, 2012.* Johns Hopkins University, 2001. www.mmhiv.com/

Centers for Disease Control and Prevention. HIV/AIDS website www.cdc.gov/hiv/dhap.htm

Centers for Disease Control and Prevention. *Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings,* MMWR 2006; 55(No.RR-14); 1-17. www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

World Health Organization. HIV/AIDS website. www.who.int/hiv/en/

Additional Resources

HIV/AIDS Program web site, Iowa Department of Public Health.
www.idph.state.ia.us/HivStdHep/HIV-AIDS.aspx?prog=Hiv&pg=HivHome

Novel Influenza A

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Influenza virus Subtype:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Influenza virus Subtype:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Influenza virus Subtype:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Fever ☐ Yes ☐ Feverish, but temp not taken ☐ No ☐ Unk Highest known fever: ___ °F/C

Cough ☐ Yes ☐ No ☐ Unk
Sore throat ☐ Yes ☐ No ☐ Unk
Runny nose ☐ Yes ☐ No ☐ Unk
Conjunctivitis ☐ Yes ☐ No ☐ Unk
Diarrhea ☐ Yes ☐ No ☐ Unk
Seizures ☐ Yes ☐ No ☐ Unk
Headache ☐ Yes ☐ No ☐ Unk
Shortness of breath ☐ Yes ☐ No ☐ Unk
Vomiting ☐ Yes ☐ No ☐ Unk

Other symptoms (specify) _____

Other complications (specify) _____

Was the patient admitted to the intensive care unit? ☐ Yes ☐ No ☐ Unk

Did the patient require mechanical ventilation? ☐ Yes ☐ No ☐ Unk

Did the patient have a chest x-ray or CAT scan performed? ☐ Normal ☐ Abnormal ☐ Test not performed ☐ Unknown

If abnormal: Was there evidence of pneumonia? ☐ Yes ☐ No ☐ Unk

Did this patient have acute respiratory distress syndrome? ☐ Yes ☐ No ☐ Unk

Did the patient handle samples (animal or human) suspected of containing influenza virus in a laboratory or other setting? ☐ Yes ☐ No ☐ Unk

OTHER LAB FINDINGS

Leukopenia (white blood cell count <5,000 leukocytes/mm3) ☐ Yes ☐ No ☐ Unk

Lymphopenia (total lymphocytes <800/mm3 or lymphocytes <15% of total WBC) ☐ Yes ☐ No ☐ Unk

Thrombocytpenia (total platelets <150,000/mm3) ☐ Yes ☐ No ☐ Unk

Were specimen sent to the Centers for Disease Control and Prevention (CDC)?

Date sent	Specimen type	CDC Lab Specimen ID	CDC (lab) unique ID

TREATMENT

Antivirals prescribed: ☐ Yes ☐ No ☐ Unknown

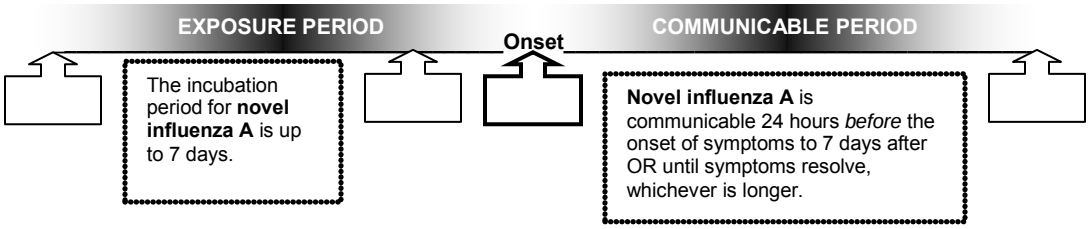
Antiviral: _____ Date started: / / Discontinued: / / Dose: _____ Unit: ☐ mg ☐ ml ☐ IU # of days: _____ # of times a day: _____ Route: _____

Antiviral: _____ Date started: / / Discontinued: / / Dose: _____ Unit: ☐ mg ☐ ml ☐ IU # of days: _____ # of times a day: _____ Route: _____

Antiviral: _____ Date started: / / Discontinued: / / Dose: _____ Unit: ☐ mg ☐ ml ☐ IU # of days: _____ # of times a day: _____ Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated with for SEASONAL influenza: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / / Lot #: _____ Vaccine: _____ Manufacturer: _____ Type: ☐ Inactivated ☐ Live attenuated ☐ Unknown

Date vaccinated: / / Lot #: _____ Vaccine: _____ Manufacturer: _____ Type: ☐ Inactivated ☐ Live attenuated ☐ Unknown

Date vaccinated: / / Lot #: _____ Vaccine: _____ Manufacturer: _____ Type: ☐ Inactivated ☐ Live attenuated ☐ Unknown

Does the patient have any underlying medical conditions? ☐ Yes ☐ No ☐ Unk

If yes, please specify _____

Is the patient immune compromised for reason such as HIV infection, cancer, chronic corticosteroid therapy, diabetes, or organ transplantation recipient? ☐ Yes ☐ No ☐ Unk

If yes to immune compromised specify reason: _____

In the 7 days prior to the onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa: ____________	Departure date: ___/___/___	Return date: ___/___/___
Traveled within U.S.? ☐ Yes ☐ No ☐ Unk	State: ______ City: ____________	Departure date: ___/___/___	Return date: ___/___/___
Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk	Country: ____________	Departure date: ___/___/___	Return date: ___/___/___

Has the patient had family members or close contacts with pneumonia or influenza-like illness? ☐ Yes ☐ No ☐ Unk

Did the patient have close contacts (within 6 feet of a person who is a suspect, probable, or confirmed Novel influenza A case with significant personal interaction (i.e. caring for, speaking to, or touching))? ☐ Yes ☐ No ☐ Unk

CONTACTS

Number of people living in case's household: _____

Close contacts of the case (For more contacts, print/copy additional contact pages.)

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	____________ Zip code: Phone: - -

Relationship to case		List symptoms		Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other	☐ Cough ☐ Sore throat ☐ Runny nose ☐ Conjunctivitis ☐ Diarrhea	☐ Seizures ☐ Headache ☐ Shortness of breath ☐ Vomiting ☐ Other specify below	/ /	☐ Yes ☐ No
Other symptoms:					

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	____________ Zip code: Phone: - -

Relationship to case		List symptoms		Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other	☐ Cough ☐ Sore throat ☐ Runny nose ☐ Conjunctivitis ☐ Diarrhea	☐ Seizures ☐ Headache ☐ Shortness of breath ☐ Vomiting ☐ Other specify below	/ /	☐ Yes ☐ No
Other symptoms:					

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	____________ Zip code: Phone: - -

Relationship to case		List symptoms		Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other	☐ Cough ☐ Sore throat ☐ Runny nose ☐ Conjunctivitis ☐ Diarrhea	☐ Seizures ☐ Headache ☐ Shortness of breath ☐ Vomiting ☐ Other specify below	/ /	☐ Yes ☐ No
Other symptoms:					

NOTES:

Diseases J-K-L

LEGIONELLOSIS

Also known as: Legionnaires' disease

Responsibilities:
Hospital: Report by IDSS, facsimile, mail, or phone, follow-up required
Lab: Report by IDSS, facsimile, mail, or phone
Physician: Report by facsimile, mail, or phone
Local Public Health Agency(LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Legionellosis is an infection caused by *Legionella* species, with *Legionella pneumophila* being the most common. Numerous serogroups are commonly recognized, although *Legionella pneumophila* serogroup 1 is most commonly associated with serious illness.

B. Clinical Description

Symptoms: Legionellosis has two distinct forms: Legionnaires' disease, which is the more severe form of the infection, and Pontiac fever, which is milder. The most common initial symptoms for Legionnaires' disease and Pontiac fever are anorexia, myalgia, malaise and headache. This is rapidly followed by fever (up to 102 – 105° F.), chills and a non-productive cough. Other symptoms may include abdominal pain and diarrhea.

Onset: Can be rapid.

Complications: Legionnaires' disease is associated with pneumonia. The case-fatality rate overall is 5% –30%. Pontiac fever is not associated with pneumonia or death and cases usually recover in 2 - 5 days without treatment. Legionnaires' disease usually cannot be distinguished from other forms of pneumonia and requires specific tests to confirm the diagnosis.

C. Reservoirs

Common reservoirs: *Legionella* species are commonly found in the environment. They have been found in many different kinds of water and water systems, such as hot and cold-water taps and showers, creeks, ponds, whirlpool spas, and cooling towers and evaporative condensers of large air-conditioning systems. Outbreaks of legionellosis have been linked to these sources, as well as to decorative fountains, humidifiers, respiratory therapy devices and grocery store vegetable misters. These bacteria are most likely to reproduce in high numbers in warm, stagnant water, and its presence may be correlated with the presence of free-living amoeba.

D. Modes of Transmission

Airborne: Legionellosis is transmitted via the airborne route after inhalation of aerosols from water sources contaminated with the bacteria. There is no evidence to suggest transmission of *Legionella* from auto air-conditioners or household window air-conditioning units that do not use water as their coolant.

Person-to-person: Legionellosis is not transmitted from person-to-person.

E. Incubation period

The incubation period for Legionnaires' disease is from 2 - 10 days, but most often 5 - 6 days.

The incubation for Pontiac fever is from 5 - 72 hours, but most often 24 - 48 hours.

F. Period of Communicability or Infectious Period

Legionellosis is not communicable from person-to-person. Water sources may continue to spread *Legionella* organisms until corrective treatment is completed.

G. Epidemiology

Legionnaires' disease was named after an outbreak that occurred in Philadelphia in 1976, among people attending a convention of the American Legion. Legionellosis has a worldwide distribution with cases reported from North America, Australia, Africa, South America and Europe. An estimated 8,000 to 18,000 people develop Legionnaires' disease in the United States each year. Most of these are single, isolated cases not associated with an outbreak. Outbreaks usually occur in the summer and fall, though cases occur year-round. Serologic surveys have shown a prevalence of antibodies to *Legionella pneumophila* serogroup 1 at a titer of $\geq$1:128 in 1–20% of the population, thus many infections go unnoticed. The illness most often affects older people and males, especially those who smoke or have chronic lung disease. Other risk factors include immunosuppressive therapy and immunosuppressive diseases, such as AIDS and diabetes. *Legionella* is estimated to be responsible for between 0.5% - 5% of cases of community-acquired pneumonias.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

To identify sources of public health concern (*e.g.,* a contaminated water source) and to stop transmission from such a source.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is through the Iowa Disease Surveillance System (IDSS). The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) cultures and tests submitted sputum, bronchi-pharyngeal and environmental samples and referred bacterial cultures for *Legionella pneumophila*. Clinical specimens and water should be shipped on wet ice in a sterile container. Cultures should be submitted on either CYE or chocolate agar. Sampling kits can be obtained from the State Hygienic Laboratory. For additional information regarding submitting samples or for further information, contact the SHL at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation: A case investigation should be performed for any diagnosed case of Legionellosis in Iowa.

Case Investigation

a. It is the local public health agency (LPHA) responsibility, in conjunction with the hospital infection preventionist, to complete an IDSS *Legionellosis* case investigation by interviewing the case and others who may be able to provide information. Much of the information required can be obtained from the case's healthcare provider or the medical record.

b. Use the following guidelines to assist in completing the IDSS investigation:
   1) Record the demographic information and occupation.
   2) Complete the "Clinical Info and Diagnosis" section, providing diagnosis, date of symptom onset, whether hospitalized (and associated dates) and outcome of disease. (One use of this section is to distinguish cases of Legionnaires' disease from Pontiac fever, when possible [*e.g.,* x-ray diagnosed pneumonia indicates Legionnaires' disease]). The investigator may need to ask the healthcare provider to submit a copy of the medical record or enlist his/her aid in completing these sections of the case report form.
   3) Record the case's exposures during the 2 weeks before illness onset. Ask questions about travel history in order to help identify where the patient became infected.
   4) Provide information regarding "Risk Factors" because legionellosis often affects people who have certain conditions or who smoke.
   5) If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please indicate this in the Notes in IDSS. When using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

c. If not using IDSS, mail (in an envelope marked "Confidential") to IDPH, Center for Acute Disease Epidemiology (CADE). The mailing address is:

   IDPH, CADE
   Lucas State Office Building, 5th Floor
   321 E. 12th Street
   Des Moines, IA 50319-0075

d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Response to a Single Case of Community-Acquired Legionellosis

One case of legionellosis does not require any further investigation other than completing the IDSS investigation. See Section 2) C, Case Investigation. Some people report that they must have gotten the infection from a particular place such as work or their places of worship or recreation. Since Legionella can be found in a wide variety of water sources at low levels, unless several cases occur that implicate a "source", it is difficult to prove a particular source was the cause of illness. It is not recommended that a water source be tested or decontaminated based on one community-acquired case.

Response to Healthcare Associated Legionellosis

A laboratory-confirmed case of legionellosis occurring in a patient hospitalized continuously for greater than 10 days before the onset of illness is considered a case of healthcare associated legionellosis. When a case of healthcare associated legionellosis occurs in a hospital or long-term care facility, the infection preventionist at the facility should enhance surveillance efforts for additional cases. If more cases are identified, measures should be taken to identify the source and eliminate the contamination. See Section 3) D below. Additionally, refer to the CDC Guidelines for Preventing Healthcare Associated Pneumonia, which are listed in the references section.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in a particular city/town is higher than usual, or if an outbreak is suspected, investigate clustered cases in the area or institution to determine possible sources of infection. A source of infection could be a cooling tower, decorative fountain, whirlpool spa, grocery store mister, etc. If the investigation indicates a common source, testing of water samples should be done and applicable preventive or control measures should be instituted. Testing water sources is a specialized procedure and will require the assistance of environmental professionals. A confirmed source should be cleaned and decontaminated according to established protocols and a schedule of continued testing must be put in place for a period of time determined on a case-by-case basis. Consult with a CADE epidemiologist at (800) 362-2736 for assistance in investigating, testing, and implementing control measures. CADE can also perform surveillance for cases regionally that may be difficult to identify at a local level.

D. Preventive Measures/Education

To avoid future exposures:

- Cooling towers should be drained when not in use and mechanically cleaned and maintained according to the manufacturer's recommendations.
- Tap water should not be used in respiratory therapy devices.
- Hotels, cruise ships and other owners of whirlpool spas and decorative fountains should maintain them according to the manufacturer's recommendations, have adequate levels of chlorine or other disinfectant at all times, and keep current on protocols for public health safety.
- After outbreaks, vigilant monitoring of proven sources should be maintained.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Legionellosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.

CDC. Guidelines for preventing health-care-associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR* 2004;53(RR03):1-36.

CDC Website. Legionellosis: Legionnaires' Disease and Pontiac Fever. www.cdc.gov/legionella/index.html

Heymann, D., ed. *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

Fiore, A.E., *et al.* Epidemic Legionnaires' Disease Two Decades Later: Legionellosis Sources, New Diagnostic Methods. *Clinical Infectious Diseases*. 1998; 26:426–433.

FACT SHEET
For Health Professionals

LEGIONNAIRES' DISEASE
(Legionellosis)

What is Legionnaires' disease?
Legionellosis is an infection caused by the bacteria *Legionella pneumophila*. The infection has two distinct forms: Legionnaires' disease, the more severe form of infection, which includes pneumonia, and Pontiac fever, a milder flu-like illness. See the Pontiac fever fact sheet for more information.

What are the symptoms of Legionnaires' disease?
Persons with Legionnaires' disease usually have fever, chills, cough, body aches, headache, tiredness, loss of appetite, and occasionally diarrhea. Laboratory tests may indicate decreased kidney function. Chest x-rays often show pneumonia. The incubation period for Legionnaires' disease is 2 - 10 days.

How is Legionnaires' disease spread?
Outbreaks of legionellosis have been associated with a water source (e.g., air conditioning cooling towers, whirlpool spas, showers) contaminated with *Legionella* bacteria. Persons may be exposed to these aerosols in homes, workplaces, hospitals, or public places.

Who gets Legionnaires' disease?
People of any age may get Legionnaires' disease. Males, especially middle-aged and older males, particularly those who smoke or have chronic lung disease, are at higher risk. Also at increased risk are persons whose immune system is suppressed by diseases such as cancer, chronic renal failure, diabetes, or AIDS. Those that take drugs that suppress the immune system are also at higher risk.

How is Legionnaires' disease diagnosed?
The diagnosis of legionellosis requires tests that are not routinely performed on persons with fever or pneumonia. Diagnosis depends on isolation of the causative organism on special media, its demonstration by direct immunoflorescent (IF) stain of involved tissue or respiratory secretions, or detection of antigens of *Legionella pneumophila* serogroup 1 in urine by radioimmunoassay (RIA) or by a fourfold or greater rise in indirect immunoflorescent antibody test (IFA) titer between an acute phase serum and one drawn 3-6 weeks later.

How long is a person infectious?
Legionnaires' disease is not spread person to person.

What is the treatment for Legionnaires' disease?
Erythromycin is the antibiotic currently recommended for treating persons with Legionnaires' disease. In severe cases, a second drug, rifampin, may be used but should not be used alone. Penicillin, cephalosporins and aminoglycosides are ineffective. Other drugs are available for patients unable to tolerate erythromycin.

Do infected people need to be excluded from school, work, or child care?
No.

Where is the *Legionella* bacterium found?
Legionella organisms can be found in many types of water systems. However, the bacteria reproduce to high numbers in warm, motionless water (95-115^{o} F), such as that found in certain plumbing systems and hot water tanks, cooling towers and evaporative condensers of large air-conditioning systems, and whirlpool spas.

What can be done to help prevent Legionnaires' disease?
Improved design and maintenance of cooling towers and plumbing systems to limit the growth and aerosolization of *Legionella* organisms are the foundations of legionellosis prevention. During outbreaks, health department investigators seek to identify the source of disease transmission and recommend appropriate prevention and control measures, such as decontamination of the water source.

FACT SHEET Legionnaires' Disease

(Legionellosis)

What is Legionnaires' disease?
Legionnaire's disease is caused by a bacterium that causes two different illnesses. Legionnaire's disease is more severe, sometimes causing severe breathing difficulty or pneumonia. Pontiac fever is a more mild form, often causing a flu-like illness (see Pontiac fever fact sheet). Both of these syndromes tend to attack people who have weak immune systems.

What are the symptoms of an infection with Legionnaires' disease?
Persons with Legionnaires' disease usually have fever, chills, cough, body aches, headache, tiredness, loss of appetite, and occasionally diarrhea.

How soon do symptoms appear?
For Legionnaires' disease, it usually takes 2 - 10 days.

How is Legionnaires' disease spread?
Whirlpool outbreaks of Legionnaires' disease have occurred after persons have inhaled the fine spray (aerosols) that come from a water source (e.g., air conditioning cooling towers, spas, showers). Persons may be exposed to these aerosols in homes, workplaces, hospitals, or public places.

Who gets Legionnaires' disease?
People of any age may get Legionnaires' disease, but the illness most often affects males, especially middle-aged and older males, particularly those who smoke or have chronic lung disease. Also at increased risk are persons whose immune system is suppressed by diseases such as cancer, chronic renal failure, diabetes, or AIDS. Those that take drugs that suppress the immune system are also at higher risk.

How long is a person infectious?
You cannot get Legionnaires' disease from another person.

What is the treatment for Legionnaires' disease?
Antibiotics are used to treat Legionnaires' disease.

Do infected people need to be excluded from school, work, or child care?
No.

What can be done to help prevent the spread of Legionnaires' disease?
Improved design and maintenance of cooling towers and plumbing systems to limit the growth and aerosolization of *Legionella* organisms are the foundations of Legionnaires' disease prevention. During outbreaks, health department investigators seek to identify the source of disease transmission and recommend appropriate prevention and control measures, such as decontamination of a water source.

FACT SHEET PONTIAC FEVER

What is Pontiac fever?
Pontiac fever is a mild form of Legionnaires' disease that often causes a flu-like illness.

What are the symptoms of Pontiac fever?
Persons with Pontiac fever usually have fever, chills, cough, body aches, headache, tiredness, loss of appetite, and occasionally diarrhea.

How soon do symptoms appear?
The time between the patient's exposure to the bacterium and the onset of illness generally ranges from a few hours to 2 days.

How is Pontiac fever spread?
Outbreaks of Pontiac fever have occurred after persons have inhaled the fine spray (aerosols) that come from a contaminated water source (e.g., air conditioning cooling towers, spas, showers). Persons may be exposed to these aerosols in homes, workplaces, hospitals, or public places.

Who gets Pontiac fever?
Persons of any age can get Pontiac fever. It occurs most commonly in persons who are healthy.

Can Pontiac fever spread from person to person?
You cannot get Pontiac fever from another person.

What is the treatment for Pontiac fever?
Pontiac fever is usually not treated with antibiotics and usually requires no specific treatment. People recover without treatment.

Do infected people need to be excluded from school, work, or child care?
No.

What can be done to help prevent Pontiac fever?
Improved design and maintenance of cooling towers and plumbing systems to limit the growth and spray of *Legionella* organisms are the keys to Pontiac fever prevention. During outbreaks, health department investigators seek the source of the disease and recommend appropriate prevention and control measures, such as cleaning the water source.

FACT SHEET
PONTIAC FEVER
For Health Professionals

What is Pontiac fever?
Pontiac fever is a mild disease recognized as a distinctly different clinical and epidemiological form of legionnaire's disease. The clinical symptoms occur after exposure to *Legionella,* but represent a reaction to inhaled antigen rather than bacterial invasion.

What are the symptoms of Pontiac Fever?
Persons with Pontiac fever experience fever and muscle aches and do not get pneumonia. They generally recover in 2 - 5 days without treatment. The time between exposure and onset of Pontiac fever is shorter, generally a few hours to 2 days.

How is Pontiac Fever spread?
Outbreaks of Pontiac fever have occurred after persons have inhaled aerosols from a water source (e.g., air conditioning cooling towers, whirlpool spas, showers) contaminated with *Legionella* bacteria. Persons may be exposed to these aerosols in homes, workplaces, hospitals, or public places.

Who gets Pontiac fever?
Pontiac fever most commonly occurs in persons who are otherwise healthy.

How is Pontiac fever diagnosed?
The diagnosis of Pontiac fever requires tests not routinely performed on persons with fever or pneumonia. Diagnosis depends upon isolation of the causative organism on special media, its demonstration by direct (immunoflorescent) IF stain of involved tissue or respiratory secretions, detection of antigens of *Legionella* pneumophila serogroup 1 in urine by radioimmunoassay (RIA), or by a fourfold or greater rise in immunoflorescent antibody test (IFA) titer between an acute phase serum and one drawn 3 - 6 weeks later.

How long is a person infectious?
Pontiac fever is not spread person to person.

What is the treatment for Pontiac fever?
Pontiac fever requires no specific treatment.

Do infected people need to be excluded from school, work, or child care?
No.

Where is the *Legionella* bacterium found?
Legionella organisms can be found in many types of water systems. The bacteria reproduce to high numbers in warm, motionless water (95-115^{o} F), such as that found in certain plumbing systems and hot water tanks, cooling towers and evaporative condensers of large air-conditioning systems, and whirlpool spas.

What can be done to help prevent the spread of Pontiac fever?
Improved design and maintenance of cooling towers and plumbing systems limit the growth and aerosolization of *Legionella* organisms are the foundations of Pontiac fever prevention. During outbreaks, health department investigators seek to identify the source of disease transmission and recommend appropriate prevention and control measures, such as decontamination of the water source.

Legionellosis

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Disease type ☐ Legionnaires Disease ☐ Pontiac Fever
Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of Death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Serogroup ☐ Other

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Serogroup ☐ Other

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Serogroup ☐ Other _____

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:

Date worked from: / / Address:

Date worked to: / / Zip code:

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:

Date worked from: / / Address:

Date worked to: / / Zip code:

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Admission date: / / Discharge date: / / Days hospitalized:

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms

Fever: ☐ Yes ☐ No ☐ Unknown Onset date: / / Highest known fever: ____ ☐ Celsius ☐ Fahrenheit

Abdominal pain ☐
Anorexia ☐
Cough ☐
Diarrhea ☐
Fever ☐
Headache ☐
Malaise ☐
Muscle pain ☐
Pneumonia ☐
Shortness of breath ☐

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

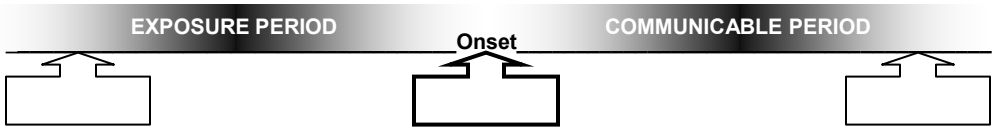
Antibiotic: Date started: / / Dose: Unit: ☐ mg ☐ ml ☐ IU # of days: # of times a day: Route:

Antibiotic: Date started: / / Dose: Unit: ☐ mg ☐ ml ☐ IU # of days: # of times a day: Route:

Antibiotic: Date started: / / Dose: Unit: ☐ mg ☐ ml ☐ IU # of days: # of times a day: Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



The incubation period for **legionellosis** is 2-10 days, with an average of 5-6 days. The incubation period for Pontiac Fever is 5-72 hours

Person to person transmission of **legionellosis** has not been documented.

RISK FACTORS/TRAVEL

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: __/__/__ — Return date: __/__/__

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: __/__/__ — Return date: __/__/__

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: __/__/__ — Return date: __/__/__

Have dialysis: ☐ Yes ☐ No ☐ Unknown

Visit a hospital: ☐ Yes ☐ No ☐ Unknown — Date visited: __/__/__

Facility name: _____ Address: _____

City: _____ State: _____ Zip code: _____ County: _____

Phone: (___)-___-____ Ext: _____ Type: _____

Water exposures

Went swimming? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below:

Types: ☐ Hot tub/spa ☐ Kiddie pool ☐ River/stream ☐ Lake ☐ Pond ☐ Water park ☐ Swimming pool ☐ Water fountain/splash pad

Location types: ☐ Hotel/motel ☐ Indoor private ☐ Indoor public ☐ Outdoor private ☐ Outdoor public

Facility names: _____ Date(s) swam: __/__/__, __/__/__, __/__/__

Address: _____ City/State/Zip: _____ County: _____

Other exposures

Worked with a Case: ☐ Yes ☐ No ☐ Unknown — From date: __/__/__ — To date: __/__/__

Lived with another Case: ☐ Yes ☐ No ☐ Unknown — From date: __/__/__ — To date: __/__/__

Received organ transplant: ☐ Yes ☐ No ☐ Unknown — Date received: __/__/__ — Organ type: _____

Cancer: ☐ Yes ☐ No ☐ Unknown — From date: __/__/__ — To date: __/__/__

Received radiation therapy: ☐ Yes ☐ No ☐ Unknown — From date: __/__/__ — To date: __/__/__

Received chemotherapy: ☐ Yes ☐ No ☐ Unknown — From date: __/__/__ — To date: __/__/__

Smoked cigarettes: ☐ Yes ☐ No ☐ Unknown — Packs per day: ☐ >2 packs a day ☐ 1 to 2 packs a day ☐ Less than a pack a day

NOTES: _____

LISTERIOSIS

Responsibilities:
Hospital: Report invasive disease by phone or mail, send isolate to State Hygienic Lab (SHL) - (319) 335-4500
Lab: Report invasive disease by IDSS, phone or mail, send isolate to SHL - (319) 335-4500
Physician: Report by IDSS, facsimile, mail, or phone
Local Public Health Agency (LPHA): Follow up required
Hospital Infection Preventionist: Follow up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent
Listeriosis is caused by the bacterium *Listeria monocytogenes*.

B. Clinical Description
Listeriosis is typically manifested as meningoencephalitis or bacteremia in newborns and adults. It may cause fever and spontaneous abortion in pregnant women. Symptoms of meningoencephalitis include fever, headache, stiff neck, nausea and vomiting. The onset may be sudden or, in the elderly and in those who are immunocompromised, it may be more gradual. Delirium and coma may occur. Newborns, the elderly, immunocompromised persons, and pregnant women are most at risk for severe symptoms. Infections in healthy persons may be asymptomatic or only amount to a mild flu-like illness. Papular lesions on hands and arms may occur from direct contact with infectious material. The case-fatality rate in infected newborn infants is about 30% and approaches 50% when onset occurs in the first 4 days of life.

C. Reservoirs
Principal reservoir for *L. monocytogenes* is in soil, forage, water, mud and silage. Other reservoirs include mammals, fowl and people. Soft cheeses may support the growth of *Listeria* during ripening and have caused outbreaks. Unlike most other foodborne pathogens, *Listeria* can multiply at refrigerator temperatures.

D. Modes of Transmission
Listeriosis may be acquired by the fetus in utero or during passage through the birth canal. Listeriosis can also be transmitted through ingestion of contaminated foods, especially pasteurized soft cheeses and ready-to-eat foods.

E. Incubation Period
Variable; outbreak cases have occurred 3 - 70 days following a single exposure to an implicated product. Median incubation is estimated to be 3 weeks.

F. Period of Communicability or Infectious Period
Although *Listeria* may be shed for several months in the stool of infected persons, person-to-person transmission is rare. Following delivery, mothers of infected newborns may shed Listeria for 7 - 10 days in vaginal secretions or urine.

G. Epidemiology
Listeria is widely distributed in nature. Most cases of human listeriosis are believed to occur sporadically, but foodborne and healthcare associated outbreaks have been documented. Foods

associated with infection include unpasteurized milk, soft cheeses, processed meats and contaminated vegetables. Newborns, the elderly, immunocompromised persons and pregnant women are at greater risk of infection. CDC estimates that approximately 1600 illnesses and 260 deaths due to listeriosis occur annually in the United States. About 30% of diagnosed cases occur within the first 3 weeks of life.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

To track the occurrence of listeriosis so that sources of major public health concern (*e.g.,* food sources) may be identified and control measures initiated.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility, the reporting number for the Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698. The mailing address is:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. It is the LPHA or the local infection preventionist's responsibility to complete a *Listerosis* case investigation by interviewing the case and others who may be able to provide pertinent information. Much of the information required can be obtained from the case's healthcare provider or the medical record.

b. Use the following guidelines to assist you in completing the investigation:
   1) Record the demographic information, occupation (if applicable), date reported, date investigation started and date of diagnosis.
   2) Record the clinical information.
   3) Indicate the type of infection caused by *Listeria monocytogenes*.
   4) Indicate the type of specimen from which *Listeria* was isolated, the type of lab test used, and date the first positive culture was obtained. If other lab tests were used diagnostically (e.g., bacterial antigen screen) please indicate the type of test(s) used and date(s) tested.
   5) If the case was diagnosed while pregnant or within 2 weeks of delivery, indicate outcome of pregnancy and associated dates.
   6) If it is suspected that the case became infected through food and part of an outbreak, refer to IDPH *Foodborne Manual*.

c. After gathering the information, the preferred method of reporting is by entering the data into the Iowa Disease Surveillance System (IDSS), or faxing the case report form to CADE's secure fax at (515) 281-5698, or by mailing the IDSS case investigation form to:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 East 12th Street
Des Moines, Iowa 50319

d. If several attempts have been to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), enter as much information as possible. Enter into the Notes section any reason why it could not be filled out completely. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

e. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

Discard any suspect foods.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of listeriosis in the LPHA's jurisdiction is higher than usual, or if an outbreak is suspected, consult with an epidemiologist at CADE at (800) 362-2736**.** Investigate to determine the source of infection and mode of transmission. A common vehicle, such as food, should be sought and applicable preventive or control measures should be instituted. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases across county lines and therefore be difficult to identify at a local level.

Note: Refer to IDPH**'s** ***Foodborne Manual*** for comprehensive information on investigating foodborne illness complaints and outbreaks.

Multi-State Clusters

The Centers for Disease Control and Prevention (CDC) is working to identify and analyze multi-state clusters of *listeriosis*. Cases that may be part of such clusters will require additional follow-up and data collection from the local public health agency. CADE will provide directions on follow-up activities for such situations on a case-by-case basis.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with CADE. CADE can help coordinate pickup and testing of food samples. If a commercial product is suspected, CADE will coordinate follow-up with relevant outside agencies.
Note: Refer to Iowa's Foodborne Illness Outbreak Investigation Manual for comprehensive information in investigating foodborne illness complaints and outbreak.

Personal Preventive Measures/Education

General recommendations:

- Thoroughly cook raw food from animal sources, such as beef, pork, or poultry.

- Wash raw vegetables thoroughly before eating.
- Keep uncooked meats separate from vegetables and from cooked foods and ready-to-eat foods.
- Avoid unpasteurized (raw) milk or foods made from unpasteurized milk.
- Wash hands, knives, and cutting boards after handling uncooked foods.
- Consume perishable and ready-to-eat foods as soon as possible.

Recommendations for persons at high risk, such as pregnant women and persons with weakened immune systems, in addition to the recommendations listed above:

- Do not eat hot dogs, luncheon meats, or deli meats, unless they are reheated until steaming hot.
- Avoid getting fluid from hot dog packages on other foods, utensils, and food preparation surfaces, and wash hands after handling hot dogs, luncheon meats, and deli meats.
- Do not eat soft cheeses such as feta, Brie, and Camembert, blue-veined cheeses, or Mexican-style cheeses such as queso blanco, queso fresco, and Panela, unless they have labels that clearly state they are made from pasteurized milk.
- Do not eat refrigerated pâtés or meat spreads. Canned or shelf-stable pâtés and meat spreads may be eaten.
- Do not eat refrigerated smoked seafood, unless it is contained in a cooked dish, such as a casserole. Refrigerated smoked seafood, such as salmon, trout, whitefish, cod, tuna or mackerel, is most often labeled as "nova-style," "lox," "kippered," "smoked," or "jerky." The fish is found in the refrigerator section or sold at deli counters of grocery stores and delicatessens. Canned or shelf-stable smoked seafood may be eaten.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Listeriosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases*, *26th Edition*. Illinois, Academy of Pediatrics, 2003.
CDC Website. Listeriosis: www.cdc.gov/listeria/index.html
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 20th Edition.* Washington, DC, American Public Health Association, 2015.
Iowa Administrative Code (641) Chapter 1 Notification & Surveillance of Reportable Communicable & Infectious Diseases, Poisonings & Conditions.

Additional Resources

Iowa Division of Inspections and Appeals, Food Inspections
www.profoodsafety.org/
State Hygienic Laboratory at the University of Iowa www.shl.uiowa.edu

FACT SHEET LISTERIOSIS

What is listeriosis?
Listeriosis is an uncommon bacterial infection. It can cause infection in the brain or blood stream, abortion in pregnant women, symptoms as mild as flu-like illness, or no symptoms at all. *Listeriosis* is found in soil, cattle forage, water, mud and silage. Other sources are infected domestic and wild mammals, fowl and people.

Who is at risk for listeriosis?
Anyone can get listeriosis, but it is seen more often in newborns, the elderly, people with diseases of the immune system and pregnant women.

How do you get listeriosis?
Listeriosis is associated with drinking raw or contaminated milk, soft cheeses, contaminated vegetables, and uncooked ready-to-eat meats. Newborns can get the infection from the mother before birth or as they pass through the birth canal.

What are the symptoms of listeriosis infection?
People infected with listeriosis may have an acute, mild illness with a fever, or infection of the brain or fluid surrounding the brain causing sudden fever, intense headache, nausea and vomiting, delirium, and coma. People may also have an infection in the heart muscle or lesions in the liver or skin.

How soon do symptoms appear?
Symptoms have occurred anywhere from 3 - 70 days following an exposure. The average time frame to disease is about 3 weeks.

How long will symptoms of listeriosis last?
Mothers of infected newborn infants may shed the infectious agent in vaginal discharges and urine for 7 - 10 days after delivery. However, some infected individuals may shed the organisms in their stools for several months.

Do infected people need to be excluded from work or school?
Since listeriosis is found in the feces (stool), people with diarrhea (especially children in child care centers or people who handle food) should not go to school or work. Most infected people may return when their diarrhea stops if they carefully wash their hands after using the toilet, diapering, and before handling food.

What is used to treat listeriosis?
Antibiotics can be used to treat listeriosis.

How can listeriosis be prevented?
Recommendations for all individuals
1. Keep uncooked meats separate from vegetables, cooked foods and ready-to-eat foods.
2. Thoroughly wash raw vegetables before eating.
3. Avoid raw/unpasteurized milk or foods made from raw milk.
4. Wash hands, knives, and cutting boards after handling uncooked foods.
5. Read and follow label instructions to “keep refrigerated” and “use by” a certain date.

Recommendations to high risk individuals
Persons at increased risk for listeriosis such as pregnant women, the elderly, and those with immunosuppressive conditions can decrease the risk if they:
1. Avoid unpasteurized soft cheeses such as feta, Brie, Camembert and blue cheese.
2. Thoroughly heat leftover foods or ready-to-eat foods such as hot dogs or processed luncheon meats before eating.
3. Although the risk of listeriosis associated with foods from delicatessen counters is relatively low, pregnant women and immunosuppressed persons may choose to avoid these foods or to thoroughly reheat cold cuts before eating.

Listeriosis

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown Date of Death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes Paper only
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Negative ☐ Positive
Organism: ***Listeria*** Type (e.g. serotype): ***monocytogenes*** ☐ Other

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Negative ☐ Positive
Organism: ***Listeria*** Type (e.g. serotype): ***monocytogenes*** ☐ Other

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Result date: / /

Result type: ☐ Preliminary ☐ Final Test type: _____ Result: ☐ Negative ☐ Positive ☐ Other _____

Organism: ***Listeria*** Type (e.g. serotype): ***monocytogenes***

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type:

Worked during symptom onset: ☐ Yes ☐ No ☐ Unknown

Date worked from: / /

Date worked to: / /

Removed from duties: ☐ Yes ☐ No ☐ Unknown

Date removed: / /

Job title:

Facility name:

Address:

Zip code:

City: State: County:

Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a healthcare setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in: ☐ Yes ☐ No ☐ Unknown

Lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type:

Worked during symptom onset: ☐ Yes ☐ No ☐ Unknown

Date worked from: / /

Date worked to: / /

Removed from duties: ☐ Yes ☐ No ☐ Unknown

Date removed: / /

Job title:

Facility name:

Address:

Zip code:

City: State: County:

Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a healthcare setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in: ☐ Yes ☐ No ☐ Unknown

Lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated during: ☐ Yes ☐ No ☐ Unk Isolation type(s):

Admission date: / / Discharge date: / / Days hospitalized:

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms:

☐ Coma ☐ Endocarditis ☐ Headache ☐ Septicemia

☐ Encephalitis ☐ Fever ☐ Nausea ☐ Vomiting

Abscesses or lesions present: ☐ Yes ☐ No ☐ Unknown

Diagnosed while pregnant: ☐ Yes ☐ No ☐ Unknown

Pregnancy outcome: ☐ 1st trimester ☐ 2nd trimester ☐ 3rd trimester ☐ Abortion ☐ Live birth ☐ Miscarriage ☐ Stillbirth

Outcome date: / /

Infant less than 4 weeks of age at onset: ☐ Yes ☐ No ☐ Unknown

While pregnant, tested for listeriosis: ☐ Yes ☐ No ☐ Unk

Test positive: ☐ Yes ☐ No ☐ Unk

Result date: / /

OTHER LAB FINDINGS

PFGE Pattern (stool specimen from case)

Was PFGE performed: ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern: _____ IA-BlnI Pattern: _____ CDC-XbaI Pattern: _____ CDC-BInI Pattern: _____

Environmental specimen testing

Food, medication or environmental samples tested? ☐ Yes ☐ No ☐ Unk

Describe samples: _____

What were the samples tested for? ☐ E. coli or EHEC ☐ Salmonella ☐ Campylobacter ☐ Listeria ☐ Shigella ☐ Other testing (specify) : _____

List positive samples: _____ Laboratory: _____

IA-XbaI pattern: _____ IA-BlnI pattern: _____

PFGE performed? ☐ Yes ☐ No ☐ Unk CDC-XbaI pattern: _____ CDC-BInI pattern: _____

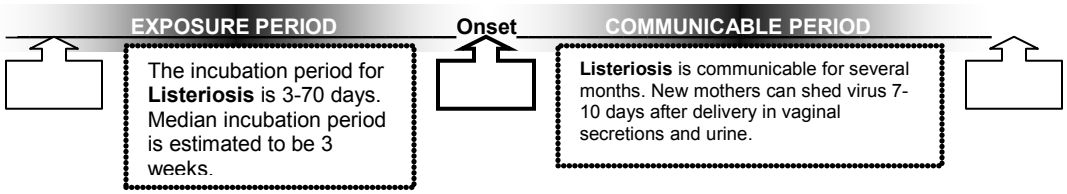
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic: _____	Antibiotic: _____	Antibiotic: _____
Date started: / /	Date started: / /	Date started: / /
Dose: _____	Dose: _____	Dose: _____
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of days: _____	# of days: _____	# of days: _____
# of times a day: _____	# of times a day: _____	# of times a day: _____
Route: _____	Route: _____	Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

In the 3 weeks before the onset of symptoms did the case purchase food products:

Store name	Address	City/State/Zip	County	Date purchased
				/ /
				/ /
				/ /

Dietary Information – ***In the* 3 *weeks prior to onset of symptoms did the case consume the following:***

Unpasturized products

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized cheese: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other unpasteurized products: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Meat and poultry products

Deli/luncheon meats: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw hot dog:	☐ Yes ☐ No ☐ Unk	From dates consumed: ___/___/___	To dates consumed: ___/___/___
List all source/types:		List all brand names:	
Pre-cooked/smoked seafood:	☐ Yes ☐ No ☐ Unk	From dates consumed: ___/___/___	To dates consumed: ___/___/___
List all source/types:		List all brand names:	

CONTACTS

Are there symptomatic contacts of the case with same exposures: ☐ Yes ☐ No ☐ Unknown

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

LYME DISEASE

Also known as: Lyme borreliosis and Tickborne meningopolyneuritis

Responsibilities:
Hospital: Report by IDSS, mail, fax or phone
Infection Preventionist: Report by IDSS, mail, fax or phone
Lab: Report by IDSS, mail, fax or phone
Physician: Report by mail, fax or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Lyme disease (LD) is caused by the corkscrew-shaped bacterium (spirochete) *Borrelia burgdorferi*.

B. Clinical Description

Lyme disease is a systemic, tick-borne disease with a variety of manifestations, including dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The best clinical marker for the disease is erythema migrans (EM), the initial skin lesion that occurs in 60%-80% of patients.
EM is a skin lesion that typically begins as a red macule or papule and expands over a period of days to weeks to form a large round lesion, often with partial central clearing. Secondary lesions also may occur. Round erythematious lesions occurring within several hours of a tick bite represent hypersensitivity reactions and do not qualify as EM. For most patients, the expanding EM lesion is accompanied by other acute symptoms, particularly fatigue, fever, headache, mildly stiff neck, arthralgia, or myalgia. These symptoms are typically intermittent. Laboratory confirmation is recommended for persons with no known exposure.

Early Localized

Signs and symptoms during the early illness tend to be nonspecific and include fever, muscle aches, headache, mild neck stiffness, and joint pain. Erythema migrans (EM) occurs at the site of the tick bite in approximately 90% of cases, although when these painless lesions occur in a location hidden from view (armpit, back, etc.), the patient does not often see them. Typically, EM rashes are circular and grow to a diameter of 5 to 15 cm, although the shape can be triangular, oval, or irregular. EM frequently clears in the center, resulting in the classic “bull’s-eye” presentation, but this does not always occur. The rash may be reported as warm or itchy, but it is usually painless.

Early Disseminated

In untreated persons, multiple EM rashes may appear within 3 to 5 weeks after the tick bite. These secondary lesions, indicative that the infection has spread into the blood, resemble the primary lesion but tend to be smaller. Common signs of early disseminated disease also include mild eye infections and the paralysis of facial muscles (Bell’s palsy). More systemic signs of this stage are headache, fatigue, and muscle and joint pain. At this stage, disruptions of heart rhythm occur in < 10% of cases.

Late

Most commonly, late disease is marked by recurrent arthritis (swelling and pain) in the knees and shoulders. Other joints may also be involved. Neurological signs may involve impairment of mood,

sleep, or memory; paralysis of facial muscles; pain or tingling sensations in the extremities; and less commonly, meningitis and encephalitis. Late-stage symptoms can persist for several years, but tend to resolve spontaneously.

Generally, prophylactic antibiotic therapy is not indicated after a tick bite, as the risk of infection with *B. burgdorferi* after a tick bite is relatively low, even in endemic areas.

C. Reservoirs

The primary vectors for Lyme Disease (LD) are *Ixodes* ticks, a distinct genus from the larger and better-known dog tick (*Dermacentor variabilis*). In Iowa, the prominent vector is *I. scapularis*, or the deer tick. Ticks acquire the spirochete that causes LD during their young, larval stage by feeding on infected animals, especially the white-footed mouse. The tick poses the greatest threat of transmitting infectious organisms to animals and humans when it bites during its next (nymphal) stage of life. Nymphs are most abundant between May and July, and they are typically found in grasses and brush. Towards the end of summer through fall, the ticks mature to the adult stage. Although adult ticks remain capable of transmitting *B. burgdorferi* to humans, they are less likely to do so.

D. Modes of Transmission

Lyme disease is acquired from a tick bite. Laboratory data suggest that the tick must usually remain attached for 24 to 48 hours before the transmission of *B. burgdorferi* can occur. Since bites from *I. scapularis* are often painless and may occur on parts of the body that are difficult to observe, cases of diagnosed LD frequently have no known history of a tick bite.

E. Incubation period

EM typically develops between 7 - 10 days after exposure (range 3 - 32 days). However, an infected individual can remain asymptomatic until the later stages of LD, several months to one year later.

F. Period of Communicability or Infectious Period

Lyme disease is not communicable from person-to-person.

G. Epidemiology

Lyme disease is the most commonly reported vectorborne illness in the U.S. In 2009, it was the 5th most common nationally notifiable disease. In 2010, 94% of Lyme disease cases were reported from 12 states: Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Jersey, New Hampshire, New York, Pennsylvania, Virginia, and Wisconsin.

The incidence of Lyme disease is associated with the density of infected tick vectors. While most cases in the United States have been reported in the Northeast, West, and upper Midwest, nearly all states have reported cases. LD incidence varies greatly among states, among counties, and by season. Most cases occur between April and October, when the risk of contact with nymphal ticks is greatest. In Iowa most cases occur in the northeast corner of the state.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify where Lyme disease occurs in Iowa.
- To recognize areas in Iowa where Lyme disease incidence has changed (increased or decreased).
- To focus preventive education.
- To target tick control measures.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing IDSS. However, if IDSS is not available, the reporting number for the IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

Laboratory confirmation of infection with *B. burgdorferi* is established when a laboratory isolates the spirochete from tissue or body fluid, detects diagnostic levels of IgM or IgG antibodies to the spirochete in serum or cerebrospinal fluid, or detects a significant change in antibody levels in paired acute and convalescent serum samples. Since the immune response to spirochetes is relatively slow, serological tests often remain negative for several weeks after exposure. The Centers for Disease Control and Prevention (CDC) recommends that, initially, serum specimens be tested by a sensitive test such as an enzyme immunoassay (EIA) or immunofluorescent assay (IFA). Samples with positive or equivocal results from these tests should be re-tested using a standardized Western blot procedure.

The University of Iowa State Hygienic Laboratory (SHL) will perform Lyme disease confirmatory testing by Western blot assay on either acute or convalescent sera that are either positive or equivocal by a Lyme-specific test, such as EIA or IFA. The State Hygienic Laboratory will also identify ticks potentially carrying *B. burgdorferi*. Finally, the State Hygienic Laboratory will also refer samples to the CDC for testing. For more information about submitting sera for testing or ticks for identification, contact the SHL at (319) 335-4500.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation: The Iowa Disease Surveillance System (IDSS) is the preferred method of completing disease investigations.

If the patient is unable or unwilling to be interviewed during the investigation, in IDSS select the appropriate reason under the Event tab in the Event Exception field.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

None.

C. Preventive Measures

Generally, prophylactic antibiotic therapy is not indicated because the risk of infection with *B. burgdorferi* after a tick bite is relatively low, even in endemic areas.

Offer the following advice to the public to reduce risk for Lyme disease.

Environmental Measures

Prevention of Lyme disease involves keeping wildlife (especially deer and rodents) out of your backyard and making your yard less attractive to ticks.

- Remove leaf litter and brush from around your home.
- Prune low-lying bushes to let in more sunlight.
- Mow lawns regularly.
- Make sure any plants near your home are not varieties that attract deer.
- Keep woodpiles in sunny areas off the ground.
- Clean up the ground around bird feeders.
- If you are going to use insecticides around your home, always follow the label instructions and never apply these chemicals near streams or other bodies of water.

Preventive Measures/Education

The best preventive measure is to avoid tick-infested areas. If in areas where contact with ticks may occur, individuals should be advised of the following:

- Wear long-sleeved shirts and long, light-colored pants tucked into socks or boots.
- Stay on trails when walking or hiking and avoid high grass.
- Use insect repellants properly. Repellants that contain DEET (diethyltoluamide) should be used in concentrations no higher than 15% for children and 30% for adults. Remember, repellants are not recommended to be used on infants. Permethrin is a repellant that can only be applied to clothing, *not* exposed skin.
- After each day spent in tick-infested areas, check yourself, your children, and your pets for ticks. Areas ticks prefer most include the back of the knee, armpit, scalp, groin, and back of the neck.
- Promptly remove any attached tick using fine-point tweezers. The tick should not be squeezed or twisted, but grasped close to the skin and pulled straight out with steady pressure. Once removed, the tick should be drowned in rubbing alcohol or flushed down the toilet.

4) ADDITIONAL INFORMATION

If a tick is available it may be sent for testing. Place tick in plastic bag, with a tissue and one to two drops of water, seal, place in envelope with your name, address, and phone number and mail to:

Iowa State University
Department of Entomology
440 Science II
Ames, IA 50011-3240

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Lyme Disease can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2009 Red Book: Report of the Committee on Infectious Diseases, 28th Edition*. Illinois, American Academy of Pediatrics, 2009.

American Lyme Disease Foundation, Inc. *A Quick Guide to Lyme Disease: How to Protect Yourself and Your Family from Serious Infection.* (Not dated.)

Heymann, D., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Centers for Disease Control and Prevention. www.cdc.gov/lyme/

CDC Notice to Readers Recommendations for Test Performance and Interpretation from the Second National Conference on Serologic Diagnosis of Lyme Disease, MMWR August 11, 1995 / 44(31);590-591
www.cdc.gov/mmwr/preview/mmwrhtml/00038469.htm

FACT SHEET LYME DISEASE

What is Lyme disease?
Lyme disease is an illness that is spread by infected ticks. It may affect the skin, nervous system, heart and joints. Most cases occur in June and July.

Who gets Lyme disease?
Anyone can get Lyme disease, especially if they spend long amounts of time outdoors in areas where infected ticks are found.

How is Lyme disease spread?
People get Lyme disease from a tick bite. Persons who are bitten by a tick but do not remove the tick immediately have a higher chance of getting Lyme disease. Lyme disease cannot be spread from person to person.

What are the symptoms of Lyme disease?
The illness usually starts as a large circular red rash at or near the site of the tick bite. The rash may increase in size and can eventually look like a "bull's eye" with a clear center. The rash is frequently not identified. Along with the rash, other "flu-like" symptoms such as fever, headache, fatigue, stiff neck, muscle and joint pain may be present. These can last for several weeks. Swelling and pain in the large joints may come and go for many years. If left untreated, further symptoms can develop within a few weeks to months after the rash occurs.

How soon do symptoms appear?
The rash or flu-like symptoms usually begin within a month after the tick bite.

What is the treatment for Lyme disease?
Antibiotics. Tetracycline, doxycycline, and penicillin are all used (but only penicillin is used in children under the age of 7 years).

Can a person get Lyme disease more than once?
Yes. One infection with Lyme disease does not protect a person from getting it again.

How should a tick be removed?
All ticks should be removed as soon as possible. The best way is to use tweezers to grab the tick as close to the skin as possible and pull it straight out. Do not use a twisting motion as it may leave part of the tick embedded. Do not squeeze the tick's body when removing it. Do not handle ticks with bare hands. Wash your hands after removing a tick. You may want to apply an antiseptic on the bite.

How can Lyme disease be prevented?
1. Do not walk barelegged in tall grass or woods where ticks may be found.
2. Wear a long-sleeved shirt, long pants, and high socks. Tuck pants legs into socks. Wear light-colored clothing so crawling ticks can be seen more easily.
3. Conduct "tick checks" every two to three hours if spending a lot of time outdoors. Check all of your skin (you may need help to do this) for ticks every day you spend in areas with lots of ticks. The ticks are most often found on the thigh, arms, underarms, and legs. Ticks can be very small, so look for new "freckles."
4. Use tick repellents containing the ingredients DEET for skin applications, bearing in mind that lower concentrations should be used on children, reapplying more often. Use Permethrin (on clothing). Always follow the directions on the can. These repellents can be found at the local drugstore. Wash off all repellents after going indoors.
5. Remove any attached ticks immediately, using the method above.

Lyme Disease

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Borrelia burgdorferi***

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Borrelia burgdorferi***

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Borrelia burgdorferi***

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Fever: ☐ Yes ☐ No ☐ Unk Onset Date: / / Duration (days): _____ Highest known fever: _____ °F/C

Other symptoms:
☐ Arthralgia
☐ Fatigue
☐ Headache
☐ Mild, stiff neck
☐ Muscle pain

Life threatening complications:
☐ Adult respiratory distress syndrome
☐ Disseminated intravascular coagulopathy
☐ Meningitis/Encephalitis
☐ Renal failure

Did the health care provider for the case diagnose Lyme disease? ☐ Yes ☐ No ☐ Unk

Erythema migrans diagnosed by physician present: ☐ Yes ☐ No ☐ Unk Onset Date: / / Lesion greater than or equal to 5 cm: ☐ Yes ☐ No ☐ Unk

Late manifestations:
☐ 2nd/3rd degree atrioventricular (AV) block
☐ Bilateral facial palsy
☐ Encephalitis/Encephalomyelitis
☐ Cranial neuritis
☐ Recurrent, brief attacks of joint swelling
☐ Lymphocytic meningitis
☐ Radiculoneuropathy

OTHER LAB FINDINGS

Higher antibody result in CSF than in serum: ☐ Yes ☐ No ☐ Unknown
Leukopenia: ☐ Yes ☐ No ☐ Unknown
Thrombocytopenia: ☐ Yes ☐ No ☐ Unknown
Elevated hepatic transaminases: ☐ Yes ☐ No ☐ Unknown

TREATMENT

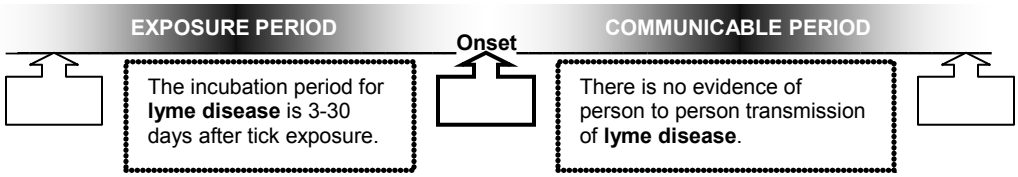
Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of days:	# of days:	# of days:
# of times a day:	# of times a day:	# of times a day:
Route:	Route:	Route:

Therapeutic medications prescribed: ☐ Yes ☐ No ☐ Unknown List medications: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Did the case spend time in a wooded, brushy, or grassy area within 30 days of the onset of symptoms?

Location name: _____

Address: _____

City/State/County: _____ Zip: _____ Is Lyme disease endemic in this county? ☐ Yes ☐ No ☐ Unk

Location name: _____

Address: _____

City/State/County: _____ Zip: _____ Is Lyme disease endemic in this county? ☐ Yes ☐ No ☐ Unk

In the 30 days prior to onset of symptoms did the case find a tick on his/her body? ☐ Yes ☐ No ☐ Unk Date found: / /

NOTES:

Diseases M-N

MALARIA

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Report by IDSS, facsimile, mail or phone. Follow-up required.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

There are four *Plasmodium* species (sporozoan parasites) that cause malaria in humans. They are *Plasmodium vivax*, *P. malariae*, *P. ovale* and *P. falciparum*.

B. Clinical Description

Symptoms: The classic symptoms of malaria are high fever with chills, sweats, and headache, which may be paroxysmal (occurring at intervals or with remissions and intensification of symptoms). The fever and paroxysmal symptoms generally occur in cycles of 1 - 3 days depending on the species causing the infection. Other symptoms can include malaise, nausea, vomiting, diarrhea, cough, arthralgia (joint aches), respiratory distress and abdominal and back pain. Paleness and jaundice may also be present. Enlargement of the liver and spleen (hepatosplenomegaly) may occur and is more prominent in chronic infections. Infection with *P. falciparum* is potentially acutely fatal and most commonly manifests as a febrile illness with or without coagulation defects, shock, renal and liver failure, acute encephalopathy, pulmonary and cerebral edema, and coma. The case-fatality rate for *falciparum* malaria is 10–40% in the absence of prompt treatment.

Duration of an untreated primary attack can vary from a week to a month or longer. Relapses of *P. vivax* and *P. ovale* infections can occur at irregular intervals. Malaria infections may persist for life (chronic infections), with or without recurrent episodes of fever.

C. Reservoirs

Humans are the only important reservoir for human malaria. Non-human primates are naturally infected by many malarial species that can potentially infect humans, but natural transmission from non-human primates to humans is extremely rare.

D. Modes of Transmission

- Malaria is transmitted by the bite of an infected female *Anopheles* mosquito.

- Rarely congenital (from mother to fetus) transmission may occur as well as transmission through transfusions or the use of contaminated needles.

E. Incubation Period

A. The time between the infective bite and the appearance of clinical symptoms is approximately 7–14 (9-14) days for *P. falciparum*, 8–14 (12-18) days for *P. vivax* and *P. ovale*, and 7–30 (18-40) days for *P. malariae*.
B. With some strains of *P. vivax*, mostly from temperate areas, there may be a prolonged incubation period of 8 – 10 (6-12) months; even longer incubations may occur with *P. ovale*.

C. With infections acquired by blood transfusion, the incubation period is dependant on the number of parasites infused; it is usually short, but may range up to 2 months.

F. Period of Communicability or Infectious Period

Malaria is not directly communicable from person-to-person except for congenital transmission; however, during parasitemia, the disease may be transmitted to other persons through blood transfusion or through shared contaminated needles. Infected human hosts remain infectious for *Anopheles* mosquitoes for prolonged periods of time (1 – 3 years, or longer, depending on the species) if they are not adequately treated.

G. Epidemiology

Malaria is endemic throughout the tropical areas of the world. About half of the world's population lives in areas where transmission occurs frequently. In 2010 an estimated 219 million cases of malaria occurred worldwide and 660,000 people died, with most (91%) in the African Region. Areas with the highest prevalence include sub-Saharan Africa, parts of Central and South America, India, and parts of Oceania and Southeast Asia. Transmission is also possible in more temperate climates such as in the United States, where *Anopheles* mosquitoes are present. Mosquitoes in airplanes flying from tropical climates have been the source of occasional cases in persons working or living near international airports ("airport malaria") and further transmission of imported cases by local mosquitoes has been documented. However, nearly all of the malaria cases reported annually in the United States (approximately 1500) are acquired abroad. *P. vivax* and *P. falciparum* are the most common species worldwide. The worldwide spread of strains of chloroquine-resistant *P. falciparum* and *P. vivax* is of increasing importance. Resistance to other antimalarial drugs is now occurring in many areas where the drugs are widely used. The only cases occurring in Iowa are imported.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify imported cases of malaria.
- To ensure that cases are appropriately contained and treated to prevent the introduction of malarial parasites into American mosquito populations.
- To identify cases acquired in the United States, if they occur, so appropriate active surveillance and mosquito control interventions can be implemented.
- To provide travelers with appropriate preventive health information.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) performs testing for malaria. Healthcare providers may send thick and thin blood smears to SHL. The CDC conducts testing for malaria by serologic tests only under special circumstances (*e.g.,* serum of a blood donor suspected of being a source of transfusion-related malaria or serum for laboratories conducting malaria-related studies) or with prior approval. For approval of serologic testing and further information contact SHL parasitology at (319) 335-4500. The SHL website is: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

It is the LPHA responsibility to complete a Malaria case investigation by interviewing the case and others who may be able to provide pertinent information. Much of the information required can be obtained from the case's healthcare provider or medical record.

1. Use the following guidelines to assist in completing the form:
   a. Record the demographic information, date of symptom onset, pregnancy status, healthcare provider information, and whether hospitalized (including location and associated dates).
   b. Record laboratory results, particularly the species of malaria, and the laboratory that performed the testing.
   c. Record information about whether and where the case has spent time out of the country in the past four years, including duration of stay and date returned.
   d. Indicate whether the case took malaria prophylaxis and, if so, what kind.
   e. Record whether the case has had a history of malaria within the past 12 months.
   f. Record whether the case has had a blood transfusion within the past 12 months. *Note:* If the patient is a recent blood donor, this information should be provided to CADE as soon as possible so CDC and other appropriate agencies can be notified.
   g. Be sure to record all clinical complications and whether the illness was fatal.
   h. Indicate which therapy was given for this illness.
2. There is a "notes" section in IDSS which can be used to document other relevant aspects of the investigation that are not captured elsewhere (*e.g.,* other risk information such as recent history of injection drug use or perinatal transmission, history of malaria prior to the last 12 months, any medical care received abroad.)
3. If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), contact IDPH and enter as much information as has been gathered. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.
4. After completing the investigation, enter into IDSS, or send FAX and attach lab report(s) and mail (in an envelope marked "confidential") to IDPH, Center for Acute Disease Epidemiology. The mailing address is:

   IDPH, CADE
   Lucas State Office Building, 5th Floor
   321 E. 12th Street
   Des Moines, IA 50319-0075
   FAX: 515-281-5698

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

No restrictions except for exclusion from blood donation.

Minimum Period of Quarantine of Contacts

No restrictions.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Locally Acquired Case

A case of malaria acquired in the United States is possible but such cases are rare. A case acquired in Iowa is even less likely. If it is determined during the course of an investigation that a case does not have a recent travel history to an endemic country, measures such as investigating areas visited by the case to locate the focus of infection and surveillance of other people for illness may be necessary. Contact the Center for Acute Disease Epidemiology at (800) 362-2736.

D. Preventive Measures

International Travel

- People traveling to malaria-endemic parts of the world should be notified of their risk of contracting the disease and control measures they can take to protect themselves from mosquitoes. Travelers can take prophylactic antimalarial drugs prescribed by their healthcare provider and use repellents, wear protective clothing and use mosquito nets when rooms are not screened.
- Detailed recommendations for preventing malaria are available 24 hours a day from the CDC Malaria Hotline, which can be accessed by telephone at (770) 488-7788, by fax at (888) CDC-FAXX or (888) 232-3299, or CDC's website: www.cdc.gov/malaria/
- Travelers and recent immigrants from malaria-endemic regions with symptoms suggestive of malaria should be referred to a healthcare provider for prompt testing and treatment. Failure to treat individuals with malaria could lead to their becoming a local source of malaria transmission to mosquitoes if bitten, then to other people bitten by those mosquitoes. This is unusual, but has occurred in the United States.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Malaria can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.
CDC. Regional Malaria Information. Available at www.cdc.gov/travel/regionalmalaria
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 20th Edition.* Washington, DC, American Public Health Association, 2015.
MDPH. *Regulation 105 CMR 300.000: Reportable Diseases and Isolation and Quarantine Requirements*. MDPH, Promulgated November 1998, (Printed July 1999).

Additional Resources:

www.cdc.gov/ncidod/dpd/parasites/malaria/malaria_form.pdf
www.cdc.gov/travel/diseases/malaria/index.htm

FACT SHEET MALARIA

What is Malaria?
Malaria is a parasite that spreads by infecting one after another two types of hosts: humans and female *Anopheles* mosquitoes. In humans, the parasites grow and multiply first in the liver cells and then in the red cells of the blood. In the blood, successive broods of parasites grow inside the red cells and destroy them, releasing daughter parasites ("merozoites") that continue the cycle by invading other red cells.

Who is at risk for Malaria?
Your greatest risk will happen when you travel outside the United States to places where there is malaria, for example South America, Southeast Asia, or sub-Saharan Africa. However, even if you live in the United States, under very rare circumstances you could get malaria.

How do you get Malaria?
Usually, people get malaria by being bitten by a female mosquito. Only mosquitoes infected with malaria parasites (from a previous blood meal taken on an infected person) can transmit malaria. Very rarely, malaria can also be transmitted through blood transfusion, organ transplant, or shared use of contaminated needles or syringes. Malaria may also be transmitted from a mother to her fetus before or during delivery ("congenital" malaria).

Can Malaria be spread from person-to-person?
Malaria is not spread from person to person like a cold or the flu. You cannot get malaria from casual contact with malaria-infected people.

What are the symptoms of Malaria?
The classical (but rarely observed) malaria attack lasts 6 - 10 hours. It consists of: a cold stage (sensation of cold, shivering), a hot stage (fever, headaches, vomiting; seizures in young children), and finally a sweating stage (sweats, return to normal temperature, tiredness).

More commonly, the patient has the following symptoms: fever, chills, sweats, headaches, nausea and vomiting, body aches, and general malaise.

How soon will symptoms appear?
The incubation period in most cases is from 7 - 30 (9-40) days.

How can Malaria be prevented?
In areas where malaria is common, prevent infected mosquitoes from biting you and take antimalarial drugs. Destroy the mosquitoes' breeding sites so that the mosquitoes cannot reproduce, and apply permethrin insecticides to the walls inside the home to kill adult mosquitoes. Sleep inside bed nets, which will be even more effective if they have been treated with insecticides. Sleep in houses that are screened or air-conditioned, and avoid exposure to mosquitoes between dusk and dawn. If outdoors, apply insect repellants containing DEET to exposed skin and long-sleeved clothing or clothing treated with permethrin.

Malaria

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of Death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative
Organism: ***Plasmodium*** Type (e.g. serotype): ☐ *ovale* ☐ *vivax* ☐ *malariae* ☐ *falciparum*

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative
Organism: ***Plasmodium*** Type (e.g. serotype): ☐ *ovale* ☐ *vivax* ☐ *malariae* ☐ *falciparum*

Laboratory: ____________ Accession #: ____________ Collection date: ___/___/___

Date received: ___/___/___ Specimen source: ____________ Result date: ___/___/___

Result type: ☐ Preliminary ☐ Final Test type: ____________ Result: ☐ Positive ☐ Negative

Organism: ***Plasmodium*** Type (e.g. serotype): ☐ *ovale* ☐ *malariae* ☐ *vivax* ☐ *falciparum*

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type:
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown
Date worked from: ___/___/___
Date worked to: ___/___/___
Removed from duties: ☐ Yes ☐ No ☐ Unknown
Date removed: ___/___/___

Job title: ____________
Facility name: ____________
Address: ____________
Zip code: ____________
City: ____________ State: ______ County: ____________
Phone: (   )-   -   Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type:
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown
Date worked from: ___/___/___
Date worked to: ___/___/___
Removed from duties: ☐ Yes ☐ No ☐ Unknown
Date removed: ___/___/___

Job title: ____________
Facility name: ____________
Address: ____________
Zip code: ____________
City: ____________ State: ______ County: ____________
Phone: (   )-   -   Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: ____________ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): ____________

Admission date: ___/___/___ Discharge date: ___/___/___ Days hospitalized: ______

Currently isolated: ☐ Yes ☐ No ☐ Unknown Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms:
☐ Fever ☐ Anorexia ☐ Backache
☐ Chills ☐ Cough ☐ Encephalitis ☐ Fatigue
☐ Headache ☐ Hypoglycemia ☐ Joint pain ☐ Muscle pain
☐ Nausea ☐ Otitis media ☐ Photophobia ☐ Pneumonia
☐ Renal failure ☐ Sweats

Complications: ☐ Anemia ☐ ARDS ☐ Cerebral malaria ☐ Renal failure

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:
☐ Artemether ☐ Artesunate ☐ Chloroquine ☐ Doxycycline ☐ Lumefantrine ☐ Mefloquine
☐ Quinidine gluconate ☐ Quinine dihydrochloride ☐ Sulfadoxine-pyrimethamine ☐ Tetracycline ☐ Other
Date started: ___/___/___
Dose: ____________

Antibiotic:
☐ Artemether ☐ Artesunate ☐ Chloroquine ☐ Doxycycline ☐ Lumefantrine ☐ Mefloquine
☐ Quinidine gluconate ☐ Quinine dihydrochloride ☐ Sulfadoxine-pyrimethamine ☐ Tetracycline ☐ Other
Date started: ___/___/___
Dose: ____________

Antibiotic:
☐ Artemether ☐ Artesunate ☐ Chloroquine ☐ Doxycycline ☐ Lumefantrine ☐ Mefloquine
☐ Quinidine gluconate ☐ Quinine dihydrochloride ☐ Sulfadoxine-pyrimethamine ☐ Tetracycline ☐ Other
Date started: ___/___/___
Dose: ____________

Unit: ☐ mg ☐ ml ☐ IU # of days: ______
# of times a day: ______ Route: ______

Antibiotic:
☐ Artemether ☐ Quinidine gluconate
☐ Artesunate ☐ Quinine dihydrochloride
☐ Chloroquine ☐ Sulfadoxine-pyrimethamine
☐ Doxycycline ☐ Tetracycline
☐ Lumefantrine ☐ Other
☐ Mefloquine
Date started: ____/____/____
Dose: ______
Unit: ☐ mg ☐ ml ☐ IU # of days: ______
# of times a day: ______ Route: ______

Antibiotic:
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Date started: ____/____/____
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☐ Lumefantrine ☐ Other
☐ Mefloquine
Date started: ____/____/____
Dose: ______
Unit: ☐ mg ☐ ml ☐ IU # of days: ______
# of times a day: ______ Route: ______

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☐ Doxycycline ☐ Tetracycline
☐ Lumefantrine ☐ Other
☐ Mefloquine
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Unit: ☐ mg ☐ ml ☐ IU # of days: ______
# of times a day: ______ Route: ______

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☐ Doxycycline ☐ Tetracycline
☐ Lumefantrine ☐ Other
☐ Mefloquine
Date started: ____/____/____
Dose: ______
Unit: ☐ mg ☐ ml ☐ IU # of days: ______
# of times a day: ______ Route: ______

Antibiotic:
☐ Artemether ☐ Quinidine gluconate
☐ Artesunate ☐ Quinine dihydrochloride
☐ Chloroquine ☐ Sulfadoxine-pyrimethamine
☐ Doxycycline ☐ Tetracycline
☐ Lumefantrine ☐ Other
☐ Mefloquine
Date started: ____/____/____
Dose: ______
Unit: ☐ mg ☐ ml ☐ IU # of days: ______
# of times a day: ______ Route: ______

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.

EXPOSURE PERIOD — **Onset** — **COMMUNICABLE PERIOD**

The incubation period for **malaria** 9 days to 12 months

Humans can infect mosquitoes and transfusional transmission can occur. Person to person is not documented.

RISK FACTORS/TRAVEL

Risk Factors/Travel Information – *In the 12 months prior to onset of symptoms*

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk State: ______ City: ______ Departure date: ____/____/____ Return date: ____/____/____

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk Country: Departure date: ____/____/____ Return date: ____/____/____

Received blood/blood products: ☐ Yes ☐ No ☐ Unk Date(s) received: ____/____/____

Received organ transplant: ☐ Yes ☐ No ☐ Unk Date received: ____/____/____

Organ type: ☐ Cornea ☐ Heart ☐ Kidney ☐ Other ______

Malaria in the past 12 months: ☐ Yes ☐ No ☐ Unk Malaria type: ☐ Falciparum ☐ Malariae ☐ Ovale ☐ Vivax

From date: ____/____/____ To date: ____/____/____

NOTES:

MEASLES

Report Immediately by phone

Also known as: Rubeola, Hard measles, Red measles, Morbilli

Responsibilities:
Hospital: Report by phone immediately
Lab: Report by phone immediately
Physician: Report by phone immediately
Local Public Health (LPHA): Report by phone immediately. Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Measles is caused by the measles virus (genus *Morbillivirus*, family *Paramyxoviridae*).

B. Clinical Description

Measles is an acute, highly communicable viral disease characterized by fever (generally as high as 104°-105°F), cough, coryza, conjunctivitis, and maculopapular rash (the 3 C's plus rash). Koplik spots (small spots with white or bluish-white centers on an erythematous base) may be present on the buccal mucosa. The rash is red and blotchy and appears on the third to seventh day; the rash begins on the face (hairline) proceeding downward and outward, reaching the hands and feet. Complications can include diarrhea, otitis media, pneumonia, encephalitis (1 per 1,000 cases), and death (1–3 per 1,000 cases), in the United States. Serious complications occur mostly from pneumonia and occasionally from encephalitis. Immune compromised individuals are at increased risk for pneumonitis, encephalitis, and death. These complications can occur in 20–80% of HIV-infected and patients receiving chemotherapy. The characteristic rash sometimes does not develop in these patients. Asymptomatic carriage has not been documented.

C. Reservoirs

Humans are the only host.

D. Modes of Transmission

Measles is transmitted airborne by droplet spread, direct contact with nasal or throat secretions of an infected person, and, less commonly by articles freshly soiled with nose and throat secretions. Measles is one of the most highly infectious diseases.

E. Incubation Period

The time from exposure to symptom onset is about 10 days with a usual range of 7 - 18 days. Occasionally onset is as long as 19 - 21 days from exposure. The rash usually appears about 14 days after exposure. Immune globulin given later than the third day of the incubation period, may extend the incubation period

F. Period of Communicability or Infectious Period

From 1 day before the beginning of the prodromal period (this is usually about 4 days before rash onset) to 4 days after the first appearance of the rash; (this is calculated by counting the day of rash onset as day zero). Immunocompromised patients may have prolonged excretion of the virus in their secretions and can be infectious for the entire duration of their illness. Measles is highly infectious, with up to 5,000 infectious particles excreted per hour. Infectious particles may remain suspended in

the air for up to 2 hours, this is dependent upon the room's ventilation, sunlight exposure and relative humidity. Thus someone may contract the disease without ever being in the same room with an infected person. There is >90% secondary attack rate in susceptible persons.

G. Epidemiology

Measles occurs worldwide. In the temperate zones, peak incidence is in late winter and early spring. One dose of MMR vaccine induces measles immunity in about 95% of people who receive it; however, due to measles' extreme infectiousness, two doses, resulting in 99% immunity, are necessary to prevent outbreaks. Two doses, administered one month apart with the first dose being after 12 months of age, are recommended.

In developing countries, case fatality rates average 3% – 5% but can range as high as 10% – 30% in some localities, and measles is the eighth leading cause of death worldwide. Since 1995, the incidence of measles in the United States has been very low, with only a few hundred cases reported each year. Indigenous transmission has been interrupted, thus almost all U.S. cases are imported, often from Europe and Asia. (Cases are considered imported from another country if the rash occurs within 18 days of entering the U.S. and the illness cannot be linked to local transmission.)

In the spring of 2004 Iowa had 3 cases of measles, the first from exposure in a foreign country and 2 cases from the first case. During 2008, more measles cases were reported in the US than in any other year since 1997. Since 2004, Iowa has had occasional individual cases reported, but not every year.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify all cases and susceptible exposed people rapidly and to prevent additional cases and further transmission of this highly contagious disease.
- To identify the source of infection so as to better understand how and why the case(s) occurred.
- To help in the international effort to eliminate indigenous transmission of measles from the Western Hemisphere.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider immediately report any suspected or confirmed case. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. After business hours, call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

What to Report to the Iowa Department of Public Health

- A case of rash illness accompanied by fever, or
- A suspect case of measles (with or without fever), as diagnosed by a healthcare provider, or
- Positive IgM serologic test for measles (this is the preferred method), or
- Significant rise between acute- and convalescent-phase titers in serum measles IgG, *or*
- Total antibody level by any standard serologic assay, or Isolation of measles virus from a clinical specimen.

Case investigation

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider report. Measles is an immediately reportable disease. Call the reporting number for IDPH Center for

Acute Disease Epidemiology (CADE) at (800) 362-2736 immediately upon identifying a suspect measles case.
After completing the investigation and gathering case information, enter the information into the Iowa Disease Surveillance System (IDSS), or FAX the report form with supporting laboratory documentation to (515) 281-5698 or mail (in an envelope marked "Confidential") to the IDPH/CADE, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Laboratory Testing Services Available

Suspect measles cases should be reported immediately to the Iowa Department of Public Health, Center for Acute Disease Epidemiology (CADE) at (800) 362-2736 or after hours, 515-323-4360. At that time, CADE will consult on appropriate testing to be ordered and specimen transport to the State Hygienic Laboratory (SHL). Public health response should not be delayed pending the return of laboratory results.

By using the Iowa SHL, transport time is significantly less, and results can be obtained more quickly. When submitting specimens to SHL, check the box in the demographics section of the order form directly below the clinician's phone number and signature. This indicates the testing is being completed because of an imminent public health threat and the test will be performed without charge to the patient. Three specimens are needed (serum and two swabs):

1. Blood Specimen for Serologic Testing

- *Measles IgM test*—obtain testing when patient first presents, do not wait. Ideally, the specimen should be drawn at least 3 days after onset of rash to minimize the possibility of false negative results. Tests that are negative in the first 72 hours after rash onset should be repeated. IgM is detectable for at least 28 days after rash onset.
- *Measles total antibody paired-titer test*—the measles IgM test above is greatly preferred because it provides an earlier result. SHL will run both an IgM and IgG if appropriate.
- Often it is appropriate to also request a serologic test for rubella IgM, since the signs and symptoms of rubella infection may mimic measles.
- Serology-collection for adults, 7 to 10 ml of blood in a red top or serum separator tube (SST), for infants, 2 to 3 ml of blood in a red top or serum separator tube (SST). Send to SHL on a cold pack, (not frozen) with a completed virus "Serology" test request form.

2. Nasopharyngeal Swab and Throat Swab:

These specimens should also be obtained when the suspect case first presents to the health care provider.

- RT-PCR for measles and virus culture requires a nasopharyngeal swab and a throat swab collected and placed in separate M4 viral transport media (VTM). The VTM is kept cold and should be sent on a cold pack, (not frozen) with a completed "Viral and Chlamydia Detection and Bacterial PCR". Measles RT-PCR will be sent to CDC for testing as appropriate.
- *Virus culture* for further characterization of the virus
    - Viral isolates will be sent to CDC for genotyping. Viral genotyping is an important component of measles surveillance and can help determine the source of the virus. (i.e. country of origin)

Shipment of specimens— SHL will conduct testing for suspect measles cases at no charge. Please request serologic testing for IgM and IgG antibodies as appropriate, RT-PCR for measles (to be sent to CDC), and virus culture for measles. Contact the SHL virus-serology laboratory at (319) 335-4277 or (319) 335-4500.

Ship using overnight, express mail, on ice packs to

State Hygienic Lab
Virus-Serology Laboratory
102 Oakdale Campus, # H102
Iowa City, IA 52242-5002

For assistance with courier service, please contact SHL (319)335-4500 or IDPH (800)362- 2736.

C. Initial Questions to Ask Healthcare Provider and Patient

In order to assess the likelihood that a suspect case is a true case prior to laboratory testing, IDPH and/or other public health staff helping in the investigation should ask about: 1) symptoms (rash onset, other clinical findings cough, coryza, conjunctivitis other) 2) measles immunization history, 3) country of origin and length of residence in US, 4) recent history of travel (to where and dates), 5) whether there were any recent out-of-town visitors (from where and dates), and 6) whether there was any recent contact with anyone with similar symptoms.

3) CONTROLLING FURTHER SPREAD

Minimum Period of Isolation of Patient

Through the 4th day after the onset of rash (counting the day of rash onset as day zero).

Minimum Period of Quarantine of Contacts

Students and staff born in or after 1957, who are not appropriately immunized and do not have serologic evidence of immunity, will be excluded from school from the 5th through the 21st day after their exposure. If exposure was continuous and/or if multiple cases occur, susceptibles will be excluded through the 21st day after rash onset in the last case. **Healthcare workers** who are not appropriately immunized and do not have serologic evidence of immunity will be excluded from work from the 5th day after their first exposure through the 21st day after their last exposure. These restrictions for students, school staff, and healthcare workers apply even if they had received IG.

A. Protection of Contacts of a Case

1. Implement control measures *before* serologic confirmation.

2. Inquire about contact with a known or suspected case or travel during the measles exposure period (8–18 days prior to onset).

3. Isolate the case during his/her infectious period, as defined above.

4. Identify all those exposed. Think in terms of the "zones of exposure" and consider members of the following groups, if they were in contact with the case during his/her infectious period.
   - Household members
   - School/child care contacts (students and staff)
   - Staff and patients at medical facility where patient was seen (including staff with and without direct patient contact)
   - Individuals at workplace of case (especially child care centers, schools, and medical settings)
   - Members of the same religious/social groups
   - Members of sports teams, or other extracurricular groups
   - Bus or carpool associates
   - Close friends
   - Persons potentially exposed at social events, travel sites, etc.

   Note: Measles is so contagious that sometimes everyone at an *entire* institution is considered exposed.

5. **Identify high-risk susceptibles** with whom the case had contact during his/her infectious period. Pregnant women, immunocompromised individuals, and infants < 12 months old should be referred to their healthcare provider.

6. **Identify all other susceptibles, that is, individuals *without* proof of immunity** as defined below:

   - Born in the United States before January 1, 1957
     (Year of birth as proof of immunity does not apply in healthcare settings); or
   - Two doses of measles containing vaccine, given at least 4 weeks apart, with both doses administered at ≥12 months of age; or
   - Serologic proof of immunity.
   - Documentation of physician-diagnosed measles

   Note:
   - Foreign-born individuals must have documentation of immunization or serologic proof of immunity. "Born before 1957" is not acceptable (see below for explanation).
   - Susceptibles include those with medical and religious exemptions to immunization.

   Year of Birth as Proof of Immunity—Epidemiologic data indicate that most individuals born in the United States before January 1, 1957 are immune to measles. This has not been found to apply to those born in other countries, where the epidemiology of measles is not well known and where measles immunization may not have been routine.

   Exceptions to the "1957 Rule" are employees in healthcare settings. Because persons born before 1957 have acquired measles in healthcare settings, vaccination of these older employees, including those who are United States-born, with 1 dose of measles, mumps, rubella (MMR) vaccine is recommended. Data suggest that healthcare personnel have a risk of acquiring measles that is 13-fold greater than that of the general population. Measles is highly transmissible and frequently misdiagnosed during the prodromal stage. It is essential that all healthcare personnel have documentation of measles immunity, regardless of their length of employment or whether they are involved in patient care. Although persons born before 1957 are generally considered to be immune to measles, serologic studies indicate that 5% - 9% of healthcare personnel born before 1957 may not be immune.

7. Immunize all susceptibles. All susceptibles ≥12 months of age, for whom vaccine is not contraindicated, must be immunized, keeping in mind the following:

   - **MEASLES VACCINE GIVEN WITHIN 72 HOURS OF EXPOSURE CAN PREVENT DISEASE.**

   - The combined MMR vaccine is the preferred formulation for all those ≥12 months of age. It will provide additional protection against mumps and rubella.

   - Vaccinating an individual who may be incubating measles is **NOT** harmful.

   - Vaccinate susceptibles even if it is >72 hours post-exposure. It will protect against exposure to the next potential generation of cases. In addition, the situation should be viewed as an opportunity to vaccinate.

   - Immunization during an outbreak. During an outbreak, MMR may be given. However, seroconversion rates after MMR immunization are significantly lower in children immunized before the first birthday than are seroconversion rates in children immunized after the first birthday. Therefore, children immunized before their first birthday should be reimmunized with MMR at 12-15 months old (at least 4 weeks after initial measles immunization) and again at school entry (4-6years).

8. Consider recommending **immune globulin (IG)** for susceptibles with contraindications to measles vaccine if it is within 6 days of exposure. IG may be used within 6 days of exposure for susceptible household or other contacts for whom risk of complications is very high (particularly contacts under 1 year old, pregnant women or immunocompromised persons), or for whom measles vaccine is contraindicated.
   - **The dose is 0.25ml/kg (0.11ml/lb) up to a maximum of 15 ml.**
   - **For immunocompromised persons 0.5 ml/kg is given, up to a maximum of 15 ml.**

Live measles vaccine should be given 5-6 months later to those for whom vaccine is not contraindicated.

9. Isolation/exclusion (non-healthcare settings):
   a. **Case**
   Isolate and exclude the case during his/her infectious period (**from 4 days before through 4 days after rash onset, counting the day of rash onset as day zero**). He/she may return to normal activities on the 5th day.

   Criteria for isolation/exclusion of cases are more rigorous for immunocompromised individuals and for others in healthcare settings.

   b. **Contacts**
   - **Susceptibles include all unvaccinated individuals without proof of immunity** as specified in sections 5 and 6 above, including:

     - Medical/religious exemptions
     - Individuals who have other contraindications to MMR vaccine
     - Those vaccinated >72 hours post exposure.
     - Those that received IG will be assessed on an individual basis

   - **Quarantine susceptibles on days 5–21 post exposure.**

   - Several criteria are used to determine when to quarantine susceptible contacts, and when they can return to normal activities, as outlined below.

     - **If there was a discrete (one-time) exposure—** quarantine on days 5 through 21 from that exposure. They may return to normal activities on the 22nd day.

     - **If there was continuous exposure**— quarantine on days 5 through 21 from the day of rash onset in the case. (However, in healthcare settings, exclusion must begin 5 days after the *earliest* exposure and extend through 21 days from the *last* exposure.) They may return to normal activities on the 22nd day.

     - **If there is more than one case of measles**—susceptibles will need to be quarantined until 21 days after the onset of rash in the last reported case in the outbreak setting. They may return to normal activities on the 22nd day.

Summary of Measles Exclusion Requirements

Case and Symptomatic Contacts	Asymptomatic Contacts
Isolate through the 4th day after rash onset (count day of rash onset as day zero). They may return to normal activities on the 5th day.	**One case:** Quarantine susceptibles for 5–21 days post-exposure. **Multiple cases:** Quarantine susceptibles for 21 days from date of rash onset in last case. **Healthcare settings:** Exclude or quarantine susceptibles from 5 days after the earliest exposure through 21 days after the last exposure.

10. Conduct surveillance for 2 incubation periods after rash onset in the last case or the last exposure in the setting, whichever is later.

B. Managing Special Situations

1. School Settings

Remember to determine if there are any:

- Pregnant teachers, staff (including those without direct contact with students) and students (do not forget about student teachers) anywhere in the school.
- Immunocompromised individuals among the students, teachers and staff anywhere in the school.
- Medical/religious exemptions anywhere in the school, among both students and staff. It is particularly important to identify these individuals in the classroom and grade of cases. Remember, **these susceptible individuals must be excluded from attending school until 2 incubation periods after the last case.**

Exclusion criteria:

- Susceptible contacts, including those in classrooms, extracurricular activities, and other settings, who **have already received one dose of MMR and receive a second dose of measles vaccine within 72 hours of exposure, can be readily readmitted;** otherwise, they should be excluded as discussed above.

- In some settings, individuals who have received their first or second dose >72 hours post exposure, **but within a specified time period (as determined by the Iowa Department of Public Health and with the local board of health)**, may be allowed to continue to attend classes.

If multiple cases occur, guidelines may be revised to include other classrooms and their teachers.

Interactions in sports and other extracurricular activities facilitate the spread of measles. Additional recommendations to prevent the spread of measles between schools can be found in the table below, "Control Guidelines for Sports Teams and Extracurricular Groups."

Iowa Department of Public Health

Control Guidelines for Sports Teams and Extracurricular Groups
Control guidelines DIFFER and are dependent on whether measles is currently occurring at your institution. **Schools without cases, but that will be involved with an institution that is experiencing cases, also need to follow control guidelines**. Please refer to the appropriate category below for the recommendations for your facility.
A. **At the School where Measles Cases Are Reported:** 1. All students, staff, supporters and media personnel leaving to attend activities at other schools or participating in sports or other group activities at your school must have proof of immunity as defined below:

- Born in the United States before January 1, 1957, or
- Two doses of measles vaccine with both doses administered at ≥12 months of age, given at least 4 weeks apart (**the second dose must have been given before the rash onset of the first case, or within 72 hours of exposure to the known cas**e), or
- Serologic proof of immunity
- Documentation of physician-diagnosed measles

If the second dose of measles-containing vaccine is given >72 hours after the onset of the first case, the student **must wait 21 days** before participating in sporting events or traveling to another school. If multiple cases occur, the student must wait until 21 days after the onset of rash in the last reported case in the outbreak setting.

2. Notify the schools to which students are traveling and inform them of:

- The cases or suspected cases at your school

- The immune status of your students and staff who will be traveling to the other school

B. **Schools without Measles Cases Receiving Students from or Traveling to a School with Measles Cases:**

All students, staff, supporters and media personnel, participating in activities with students from a school with cases, **must have proof of immunity** as defined below.

- Born in the United States before January 1, 1957, or
- Documentation of physician-diagnosed measles
- Two doses of measles vaccine with both doses administered at ≥12 months of age, given at least 4 weeks apart (as outlined above), or
- Serologic proof of immunity

2. Healthcare Settings

Recommendations for healthcare facilities are *more rigorous*.

a. **Proof of immunity—**The risk of acquiring measles in medical settings is up to 13-fold higher than in other settings. Therefore, documentation of immunity is extremely important.
   - All staff born on or after January 1, 1957 should have proof of two doses of measles vaccine or serologic proof of immunity, with a second dose having been given ≤72 hours after exposure.
   - Medical personnel born before January 1, 1957 have acquired measles from cases in medical facilities. Therefore, strong consideration should be given to requiring at least one dose of measles vaccine for staff born before 1957. Vaccinating immune persons is not harmful.
   - In special high-risk healthcare settings such as transplant, oncology, neonatal units, etc., exclusion criteria should be even more rigorous. Infection prevention personnel may wish to exclude all susceptible personnel even if they have been immunized within 72 hours.

b. **Initial management of patients with febrile rash illness—**Assess and screen all patients with febrile rash illness, either prior to or immediately on arrival at the intake area.
   - Escort patients to a separate waiting area or place immediately in a private room.
   - Both patients and staff should wear appropriate masks/respirators (masks for patients to prevent generation of particles, and respirators for staff, if possible, to filter airborne particles).
   - If not admitted, maintain airborne precautions (including while patient is exiting the facility, *e.g.,* separate exit). Patients should be instructed to remain in isolation at home, through 4 days after rash onset (with onset of rash being day zero).

- Measles virus can remain suspended in the air for up to 2 hours. Therefore, we recommend that susceptible patients **NOT** be placed in a room, which has been occupied by a suspect case for 2 hours following the case's exit from that room.

c. **Infectious period**
- **Cases** are considered to be infectious from **4 days** before rash onset through 4 days after rash onset, counting the day of rash onset as day zero. Therefore, **cases are considered infectious for a total of 9 days.**
- **Immunocompromised patients** may have prolonged excretion of viral particles in their secretions, and should be **considered infectious for the duration of their illness**.

d. **Exclusion/isolation of cases**
- **Personnel** who become sick should be excluded from work for 4 days after they develop a rash consistent with measles. They may return on the 5th day.
- If **admitted**, **patients** should be on airborne precautions (in addition to standard precautions) while infectious (4 days before rash onset through 4 days after rash onset) in a negative pressure room. They may be taken off isolation on the 5th day.
- If **not admitted, patients** should maintain respiratory isolation while exiting the facility, *e.g.,* mask, separate exit, and remain in isolation at home through 4 days after rash onset. They may return to normal activities on the 5th day.

e. **Exclusion/isolation of contacts—**The exclusion periods are extended in the healthcare setting.
- **Susceptible staff contacts** should be excluded from the 5th day after the earliest exposure through the 21st day after the last exposure to the case during his/her potential infectious period (as defined above). They may return on the 22nd day.
- **Susceptible hospitalized patient contacts** should be placed in airborne infection isolation, includes negative pressure room, from day 5 after the earliest exposure through day 21 after the last exposure to the case during his/her potential infectious period (as defined above). They may be taken off isolation on the 22nd day.

The above recommendations are summarized in the table below, "Measles Control in Medical Settings."

Iowa Department of Public Health

Measles Control in Medical Settings

This table summarizes additional control measures to decrease nosocomial measles transmission.

1. Assess and screen all patients with rash illness or with other potential airborne diseases, prior to arrival at intake area, i.e. outside.

2. Escort patients to a negative pressure private room.

3. Both patients and staff should wear appropriate masks/respirators (masks for patients to prevent generation of particles, and respirators for staff, if possible, to filter airborne particles).

4. If admitted: maintain on airborne precautions (in addition to standard precautions) while infectious in a negative pressure room. (Patients are considered infectious for 4 days before through 4 days after rash onset, counting the day of rash onset as day zero.)

5. If not admitted: maintain respiratory isolation, including while patient is exiting the facility, (*e.g.,* mask, separate exit). Ideally the patient would be assessed outside of the healthcare facility. Patient should remain in isolation at home through 4 days after rash onset, counting the day of rash onset as day zero. The patient may resume normal activities on the 5th day.

6. Avoid placing susceptibles in a room, which has been occupied by a suspect case for 2 hours following the case's exit.

7. Identify all contacts among patients and staff:
   - This includes patients and families in the waiting and examination rooms up to 2 hours after index case was present;
   - Includes all staff both with and without direct patient contact;
   - Due to airborne route of transmission, those exposed often include everyone at the entire facility.

8. Identify susceptibles (particularly high-risk susceptibles) and offer:
   - MMR as soon as possible but within 72 hours of exposure (will most likely prevent illness if given in this window), or
   - For high-risk susceptibles and those ineligible for vaccination, IG as soon as possible but within ≤6 days after exposure (may modify or prevent illness, but a recipient can still be considered infectious)

9. Notify infection prevention, employee health, department heads and the healthcare providers of exposed patients.
   - Post a "Measles Alert."

10. Exclusion of susceptibles:
   - All staff born in or after 1957, who have not received a second dose of measles vaccine ≤72 hours post exposure, must be **excluded from 5 days after their earliest exposure through 21 days after their last exposure to the case during his/her potential infectious period.**
   - All staff born before 1957 that have not received 1 dose of MMR ≤72 hours post exposure must be excluded 5 through 21 days post exposure.
   - Staff who contract measles should be excluded for 4 days after their first day of rash onset.

   In special high-risk healthcare settings such as transplant, oncology, neonatal units, etc., exclusion criteria should be even more rigorous. Infection prevention personnel may wish to exclude all susceptible personnel even if they have been immunized within 72 hours.

3. Management and MMR Vaccination of HIV-Infected Individuals and their Contacts

The American Academy of Pediatrics (AAP) and the Advisory Committee on Immunization Practices (ACIP) have recently revised their recommendations regarding the management of HIV-infected individuals exposed to measles, as well as the routine MMR immunization of those with HIV infection, particularly those with severe immunosuppression. These guidelines, applicable to children and adults, are summarized below.

a. Management of HIV-Infected Individuals Exposed to Measles

1) MMR or IG should be given, depending on the situation:

- **Asymptomatic HIV-infected individuals who are not severely immunosuppressed** (*i.e.,* with higher age-specific CD4+ T-lymphocyte counts or percentages than those in the table on the next page), *if susceptible and exposed ≤ 3 days prior* should receive MMR vaccine.

- **Asymptomatic HIV-infected individuals who are not severely immunosuppressed** (*i.e.,* with higher age-specific CD4+ T-lymphocyte counts or percentages than those in the table on the next page), *if susceptible and exposed 3–6 days prior* should receive *0.25cc/kg IM* immune globulin (maximum 15cc). Live measles vaccine should be given 5-6 months later to those for whom vaccine is not contraindicated.

- **Symptomatic HIV-infected individuals who are severely immunosuppressed** (as defined in the table on the next page), *regardless of past history of immunizations or*

disease, unless they have recent serologic proof of immunity should receive IG 0.5cc/kg IM (15cc max).

2) If an individual has received intravenous immune globulin (IVIG) (400 mg/kg) ≤ 3 weeks *before* exposure, no additional IG is required. However, some experts recommend an additional dose of IVIG if ≥ 2 weeks have elapsed since last treatment. (Remember, when deciding to vaccinate these individuals, MMR vaccine should be given ≥ 2 weeks *before* any IG or other blood products.)

b. **Management of Contacts of HIV-Infected Individuals Who Are Themselves Exposed to Measles**
   - If they are susceptible and exposed < 3 days prior, they should receive MMR vaccine. There is no shedding from the MMR vaccine.
   - If they are susceptible and exposed 3–6 days prior, they should receive IG and live measles vaccine should be given 5-6 months later to those for whom the vaccine is not contraindicated.

c. **General Guidelines for the Use of MMR Vaccine in HIV-infected and Potentially HIV-infected Individuals**

1) Prevaccination HIV testing is **NOT** recommended.

2) MMR vaccine is **recommended** for routine immunization of individuals with asymptomatic HIV infection who do not have evidence of severe immunosuppression.

3) MMR vaccine should be **considered** for all symptomatic HIV-infected persons who do not have evidence of severe immunosuppression, as defined in the table below.

4) It is now recommended that **severely immunocompromised HIV-infected individuals** (as defined by low CD4+ counts or low percent of CD4+ circulating lymphocytes—see table below) should **NOT** receive MMR or other measles-containing vaccines.
Measles-containing vaccines are *contraindicated* for HIV infected individuals with the following:

Age Group	Total CD4+ Count	*or*	CD4+ as a % of Total Lymphocytes
< 12 mo.	< 750/mcL	*or*	< 15%
1-5 years	< 500/mcL	*or*	< 15%
6-12 years	< 200/mcL	*or*	< 15%
≥ 13 years	< 200/mcL	*or*	< 14%

5) It is now recommended that **severely immunocompromised HIV-infected individuals** (as defined by low CD4+ counts or low percent of CD4+ circulating lymphocytes—see above table) should **NOT** receive MMR or other measles-containing vaccines.

6) Since the immunologic response to vaccines is often poor in HIV-infected patients, the first dose of MMR should be given as early as possible after 12 months old. This will increase the chance of an adequate immune response, before further deterioration of the immune system.

7) Give the second dose of MMR 4 weeks after the first. This will increase the likelihood of seroconversion.

8) During outbreak situations only, consider giving the first dose of **monovalent** measles vaccine or MMR if monovalent is unavailable at 6–11 months of age to those infants who are not severely immunocompromised. Remember, these children **must be revaccinated** with 2 doses of MMR beginning at 12 months of age.

C. Preventive Measures

Personal Preventive Measures/Education

Vaccination, including routine childhood vaccination, catch-up vaccination of adolescents, and targeted vaccination of high-risk adult groups (including international travelers), is the best preventive measure against measles. It is particularly important to vaccinate susceptible household contacts of high-risk susceptibles who cannot themselves be vaccinated, such as immunocompromised individuals, pregnant women, and infants. Good personal hygiene (which consists of proper handwashing, disposal of used tissues, not sharing eating utensils, etc.) is also important in preventing measles.

Please refer to the most current versions of the Advisory Committee on Immunization Practices (ACIP) statement on measles, rubella, and mumps.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Measles can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

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CDC. Immunization of Healthcare Workers. Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC). *MMWR.* 1997; 46:RR-18.

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Ray P, Black S, Shinefield H, et al. Risk of chronic arthropathy among women after rubella vaccination. Vaccine Safety Datalink Team. *JAMA* 1997;278:551-6.

FACT SHEET MEASLES

(Rubeola, Hard measles, Red measles, Morbilli)

What is measles?
Measles is an acute, highly communicable viral disease. Complications include diarrhea, ear infection, pneumonia, brain swelling and death.

Who gets measles?
Anyone, regardless of age, who has not had measles or has not been adequately immunized, may get the disease. Most cases occur in unimmunized preschoolers and young adults.

How is measles spread?
Measles is spread through the air by droplets from the nose, throat, and mouth of an infected person by coughing, sneezing, or simply talking.

How soon do infected people get sick?
The fever usually a start 7 - 18 days after infection, rash appears approximately 14 days after infection.

What are the symptoms of measles?
Measles causes a high fever, cough, runny nose, watery eyes, and a red rash that moves from the face to the rest of body. The symptoms may last from 1 - 2 weeks.

How long is an infected person able to spread measles?
An infected person is able to spread measles from 4 days before the rash starts to 4 days after the rash appears.

What should you do if you think you may be infected?
Call your healthcare provider and discuss your symptoms and any possible exposure before showing up at the clinic. The physician will advise you to either come to the clinic or arrange for you to be seen at a different location so other people are not exposed.

Can a person get measles again?
No. One attack of measles provides protection for life.

What is the treatment for measles?
There is no specific treatment for measles disease. Treating the symptoms such as a fever with Tylenol and itching with cool soaks may provide some relief. However, infants with high fever (>101.4) and children with headaches should be seen and treated by a doctor.

Should people who have been around a person infected with measles be treated?
Live measles vaccine provides permanent protection and may prevent disease if given within 72 hours of exposure. Immune globulin (IG) may prevent or modify disease if given within 6 days of exposure.

How can the spread of measles be stopped?
Vaccinate anyone who has not had measles or who has not had 2 measles vaccinations. Children require 2 doses for school entry. Adults born in and after 1957 also need vaccination, if they can not provide proof of 2 doses of vaccine, or the results of a blood test showing evidence of immunity.

Does measles vaccine cause reactions?
Adverse reactions following measles vaccination are generally mild and usually consist of fever and brief rash 5 - 12 days post vaccination. MMR vaccine does not contain thimerosol; there is no evidence that any vaccine causes autism or autism spectrum disorder. On rare occasions (1 in every million doses) a child may have a more serious reaction to MMR vaccine such as inflammation of the brain (encephalitis). MMR vaccine may be administered to egg-allergic children without prior routine testing or the use of special protocols.

Where can a person receive measles vaccine?
You may receive your vaccines from your doctor, your local public health clinic, WIC providers, or where your baby gets their well baby check-ups.

Measles

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Measles virus

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Measles virus

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Measles virus

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms

Fever ☐ Yes ☐ No ☐ Unk Onset date: / / Duration: hrs/days Date returned to normal activities: / /
Cough ☐ Yes ☐ No ☐ Unk Onset date: / /
Runny nose ☐ Yes ☐ No ☐ Unk Onset date: / /
Red eyes w/t drainage ☐ Yes ☐ No ☐ Unk Onset date: / /
Diarrhea ☐ Yes ☐ No ☐ Unk Onset date: / /
Thrombocytopenia ☐ Yes ☐ No ☐ Unk Onset date: / /
Arthritis ☐ Yes ☐ No ☐ Unk Onset date: / /
Other complications: Describe:

Other symptoms

☐ Abdominal cramps
☐ Backache
☐ Chills
☐ Encephalitis
☐ Fatigue
☐ Fever
☐ Sore throat
☐ Vomiting
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Otitis media
☐ Photophobia

Rash: ☐ Yes ☐ No ☐ Unk Onset date: / / Duration: hours/days
Fever continued w/t rash: ☐ Yes ☐ No ☐ Unk Rash spreading: ☐ Yes ☐ No ☐ Unk
Rash equally distributed: ☐ Yes ☐ No ☐ Unk Rash appeared at once: ☐ Yes ☐ No ☐ Unk
Lesions present: ☐ Yes ☐ No ☐ Unk Rash initial location: ☐ Arms ☐ Face ☐ Legs ☐ Trunk ☐ Inside mouth

cm

# of days for first lesion to crust: days

Lesions in same stage of development: ☐ Yes ☐ No ☐ Unk

Rash characteristics:
☐ Burning
☐ Confluent lesions
☐ Could be felt (papule)
☐ Could not be felt (macule)
☐ Discrete lesions
☐ Distinct sharp borders
☐ Dusky brown
☐ Marked itching
☐ Numbness
☐ Painful
☐ Peeling skin
☐ Pustule
☐ Reddish
☐ Scaling/crusting

Heaviest lesion area: ☐ Arms ☐ Face ☐ Legs ☐ Trunk ☐ Scalp

Areas present: ☐ Inside mouth ☐ Palms ☐ Soles

Severity: ☐ < 50 lesions ☐ 50 – 249 lesions ☐ 250 – 500 lesions ☐ > 500 lesions

Koplik's spots: ☐ Yes ☐ No ☐ Unk

Healthcare provider visited: ☐ Yes ☐ No ☐ Unk

Date(s) visited: __/__/__, __/__/__, __/__/__

Swollen lymph nodes: ☐ Yes ☐ No ☐ Unk

Location: _____

TREATMENT

Antivirals prescribed: ☐ Yes ☐ No ☐ Unknown

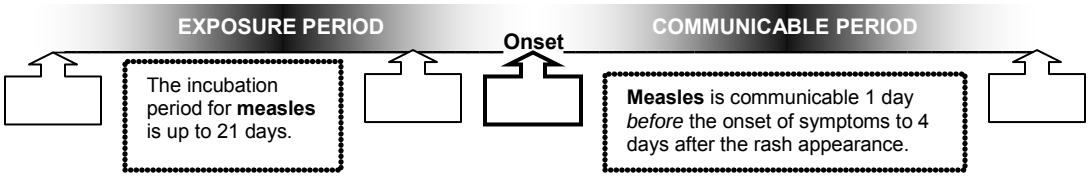
Antiviral:	Antiviral:	Antiviral:
Date started: __/__/__	Date started: __/__/__	Date started: __/__/__
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of days:	# of days:	# of days:
# of times a day:	# of times a day:	# of times a day:
Route:	Route:	Route:

Therapeutic medications prescribed? ☐ Yes ☐ No ☐ Unk

List medications: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated with MMR: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: __/__/__	Date vaccinated: __/__/__	Date vaccinated: __/__/__
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

Number of vaccinations: ____

In the 21 days prior to the onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:	Departure date: __/__/__	Return date: __/__/__
Traveled within U.S.? ☐ Yes ☐ No ☐ Unk	State: ____ City: ____	Departure date: __/__/__	Return date: __/__/__
Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:	Departure date: __/__/__	Return date: __/__/__

Born outside the U.S.? ☐ Yes ☐ No ☐ Unknown Country outside the U.S.: _____

Immunocompromised? ☐ Yes ☐ No ☐ Unknown

In the 1 day prior to the onset of rash through 4 days after the onset of rash did the case:

Use public transportation: ☐ Yes ☐ No ☐ Unk

Date(s) used:	Time(s) used:	Type:	Route:
/ /			
/ /			
/ /			

Visit a doctor's office, clinic or hospitals: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Facility name:		Facility name:	
Address:		Address:	
Zip code:	City:	Zip code:	City:
State:	County:	State:	County:
Phone: ( )- -	Type:	Phone: ( )- -	Type:
Date visited: / /	Time visited:	Date visited: / /	Time visited:
Provider name:	Title:	Provider name:	Title:

Visit a public places: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Phone	Date(s) visited	Time visited
		( )- -	/ /	
		( )- -	/ /	
		( )- -	/ /	

Attend religious gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Attend family gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Attend other gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Setting Acquired:

Child care	☐ Yes	☐ No	☐ Unk	Hospitalized	☐ Yes	☐ No	☐ Unk	Home	☐ Yes	☐ No	☐ Unk
Church	☐ Yes	☐ No	☐ Unk	International traveler	☐ Yes	☐ No	☐ Unk	School	☐ Yes	☐ No	☐ Unk
College	☐ Yes	☐ No	☐ Unk	Military	☐ Yes	☐ No	☐ Unk	Urgent care	☐ Yes	☐ No	☐ Unk
Correctional Facility	☐ Yes	☐ No	☐ Unk	Hospital ER/ Outpatient	☐ Yes	☐ No	☐ Unk	Work	☐ Yes	☐ No	☐ Unk
Doctors office	☐ Yes	☐ No	☐ Unk					Other			

Disease traced within 2 generations of known international import? ☐ Yes ☐ No ☐ Unk

CONTACTS

Number of people living in case's household: ____

Close contacts of the case (For more than one contact, print/copy additional contact pages.)

Last name: _____ Address: _____

First name: _____ City/State/Zip: _____ County: _____

DOB: ___/___/_____ Age: _____ Phone: _____ Type: _____

Gender: ☐ Female ☐ Male ☐ Other Symptoms present: ☐ Yes ☐ No ☐ Unk Onset date: ___/___/_____

If this contact has an onset date before this case then create a new case and event.

Symptoms:

Fever ☐	Onset date: ___/___/_____		Vomiting ☐	Onset date: ___/___/_____	
Runny nose ☐	Onset date: ___/___/_____		Cough ☐	Onset date: ___/___/_____	
Rash ☐	Onset date: ___/___/_____		Red eyes w/t discharge ☐	Onset date: ___/___/_____	
Chills ☐	Onset date: ___/___/_____		Backache ☐	Onset date: ___/___/_____	
Fatigue ☐	Onset date: ___/___/_____		Encephalitis ☐	Onset date: ___/___/_____	
Joint pain ☐	Onset date: ___/___/_____		Headache ☐	Onset date: ___/___/_____	
Nausea ☐	Onset date: ___/___/_____		Muscle pain ☐	Onset date: ___/___/_____	
Photophobia ☐	Onset date: ___/___/_____		Otitis media ☐	Onset date: ___/___/_____	
Sore throat ☐	Onset date: ___/___/_____		Pneumonia ☐	Onset date: ___/___/_____	
			Swollen lymph nodes ☐	Onset date: ___/___/_____	

Vaccinated for measles (MMR): ☐ Yes ☐ No ☐ Unk Number of vaccinations:

Date vaccinated: ___/___/_____	Date vaccinated: ___/___/_____	Date vaccinated: ___/___/_____
Lot #: _____	Lot #: _____	Lot #: _____
Vaccine type: _____	Vaccine type: _____	Vaccine type: _____
Manufacturer: _____	Manufacturer: _____	Manufacturer: _____

Exposed to measles: ☐ Yes ☐ No ☐ Unk

Received IG within 6 days of exposure: ☐ Yes ☐ No ☐ Unk

Tested for immunity: ☐ Yes ☐ No ☐ Unk

Received MMR within 3 days of exposure: ☐ Yes ☐ No ☐ Unk

Date received: ___/___/_____ Dose: _____ Unit: _____ Route: _____

Result: ☐ IgM+ ☐ IgM- ☐ IgG+ ☐ IgG-

Is this contact a case? ☐ Yes ☐ No ☐ Unk

NOTES: _____

PROPHYLAXIS

Name	DOB	Exposed to case	Vaccinated for measles	Number of doses	Dates of vaccination	Received MMR due to this exposure	Received IG due to this exposure	Notes
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	
	/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		/ /	☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	

Meningococcal Infection (Invasive)

Report Immediately by Phone

Also known as: Spinal or bacterial Meningitis, Meningococcemia

Responsibilities:
Hospital/Infection Preventionist: Report by phone immediately
Lab: Report by phone immediately; send all isolates from invasive sites to SHL for testing and serogrouping
Physician: Report by phone immediately
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Invasive meningococcal infections are caused by the bacterium *Neisseria meningitidis* (meningococcus), a gram-negative diplococcus. There are 13 serogroups of *N. meningitidis*; nine of these serogroups are known to cause invasive disease (A, B, C1+, C1-, L, X, Y, W-135, and Z) in humans.

Note: Other organisms, including several viruses, can cause meningitis. This chapter is only referring to meningitis caused by *N. meningitidis*.

B. Clinical Description

Symptoms

Invasive infection with *N. meningitidis* may cause several clinical syndromes, including meningitis, bacteremia, sepsis or pneumonia. Symptoms of **meningitis** (infection of the meninges, the membrane covering the brain and spinal cord) typically include the sudden onset of a stiff neck, high fever and headache. A petechial rash (small red pinpoints that do not blanch when compressed) may also be present. Nausea, vomiting and mental confusion are often also present. **Meningococcemia** (infection of the blood) typically presents with the abrupt onset of fever, chills, malaise, prostration and rash (urticarial, maculopapular, purpuric or petechial).

Onset is usually abrupt.

Complications

Fulminant cases who present with purpura (large areas of subdermal bleeds), disseminated intravascular coagulation, shock, and/or coma and may lead to death within hours, despite appropriate therapy. The case-fatality rate for meningococcal meningitis and meningococcemia is about 5% – 15%, even with appropriate antibiotic treatment. Persons with certain complement deficiencies (blood disorders that cause immunosuppression) are more susceptible, as are persons without a spleen or a functioning spleen.

C. Reservoirs

Humans are the only known reservoir of *N. meningitidis*. Approximately 5 to 10% of the population may carry this bacteria in the nasopharynx at any given time.

D. Modes of Transmission

The principal mode of transmission of *N. meningitidis* is person-to-person through direct contact with a case's oral or nasal secretions. The bacteria may also be spread through droplets or via an inanimate vehicle contaminated with saliva (*e.g.,* a cigarette, baby's toy or water bottle).

E. Incubation period

The incubation period ranges from 2 – 10 days, with an average incubation period of 3 – 4 days. Due to the asymptomatic carrier state, it is usually difficult to determine when exposure occurs.

F. Period of Communicability or Infectious period

Cases remain infectious as long as meningococci are present in oral secretions or until 24 hours after initiation of treatment with the appropriate antibiotic. Most carriers do not easily spread the organism.

G. Epidemiology

Sporadic cases and occasional outbreaks of invasive meningococcal disease occur worldwide. A "meningitis belt" extends from sub-Saharan Africa into India/Nepal, and invasive meningococcal disease due to *N. meningitidis* serogroup A is considered endemic in these areas. Epidemics of meningococcal meningitis also occur in this meningitis belt every 8 - 12 years and last from 2 - 4 years. Seasonal variations occur in these epidemics. Highest rates usually occur in dry, hot seasons, (December through June). The prevalent serotypes of *N. meningitidis* in other parts of the world may vary over time and by geography.

In the United States, the largest number of cases of invasive meningococcal disease usually occurs during the winter and early spring, coincident with an increase in the occurrence of acute respiratory infections. Historically in the U.S., cases of invasive meningococcal disease were most commonly seen in children <11 years old. Sporadic cases of meningococcal disease account for more than 98% of cases. Meningococcal pneumonia is more commonly seen in older patients. In the U.S., outbreaks of invasive meningococcal disease occur most frequently in crowded conditions (i.e., military bases, college dormitories). Cases of invasive meningococcal disease in the U.S. are most often caused by serogroups B, C and Y (each accounting for approximately 30% of reported cases), although other serogroups are also seen sporadically. Epidemics of invasive disease are most commonly associated with serogroups C and Y. Serogroup A is seen rarely in the U.S. Over the last 10 years, Iowa reported cases have averaged 29 per year, with deaths averaging 3 per year. In 2011, Iowa reported 12 cases; 6 were group B, 4 were group Y, 2 were group W-135, and 2 were undetermined.

Meningococcal carriage: *N. meningitidis* typically colonizes the nose and throat of 5-10% of the general population at any given time. These carriers are generally asymptomatic, and carriage of the bacteria may act as an immunizing exposure. By young adulthood, the majority of people in the United States have measurable antibody to the pathogenic serogroups of *N. meningitidis*. Carriers can spread the bacteria to others through saliva and respiratory secretions. Factors that increase colonization are antecedent upper respiratory tract infection, household crowding and both active and passive smoking.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify close contacts of the case and provide recommendations for appropriate preventive measures and thus prevent further spread of infection.
- To provide information about the disease, its transmission, and methods of prevention.

- To promptly identify clusters or outbreaks of disease and initiate appropriate prevention and control measures.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider immediately report any suspected or confirmed case. The disease reporting number for the Center for Acute Disease Epidemiology (CADE) is (800) 362-2736.After business hours, call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

Laboratory Testing Services Available

The State Hygienic Laboratory (SHL) will confirm and serogroup isolates of *N. meningitidis.* Laboratories are required to submit all isolates cultured from normally sterile sites for serogrouping. This serogrouping aids in public health surveillance and prevention of transmission. In addition, SHL will isolate the organism from appropriate clinical samples upon request. For more information on submitting specimens, contact SHL at (319) 335-4500, or visit: www.shl.uiowa.edu/

Note: Isolates obtained from sputum or throat cultures are not considered to come from sterile sites; therefore *N. meningitidis* from these sites is in itself not indicative of invasive disease and is not reportable. If a patient with culture-positive sputum has an illness compatible with invasive meningococcal disease, this should be reported and the appropriate sterile sites should then be cultured.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a. Report suspect or confirmed cases of meningococcal disease **immediately** to CADE by calling (800) 362-2736. This disease requires immediate follow-up with prophylaxis given to contacts of the case.

b. After notification of CADE, it is the LPHA, along with the hospital infection preventionist's, responsibility to investigate by asking the questions on and complete an Invasive Meningococcal Disease Case Investigation form by interviewing the case and/or others who may be able to provide pertinent information. CADE staff is available 24/7 to assist in the follow-up of a case. The preferred method of case investigation is by using the Iowa Disease Surveillance System (IDSS).

c. The main focus when following up a case of invasive meningococcal disease is to prevent additional cases of disease in contacts of the case. The investigation form will assist in collecting the appropriate information for complete contact identification and referral.

d. The first step to following up a case of invasive meningococcal infection is to confirm the diagnosis. Often, reported cases of "meningitis" are ultimately found to be caused by bacteria other than *Neisseria meningitidis* or by a virus. Ask for antigen testing if antibiotics were started before cultures were taken. When *N. meningitidis* is suspected or confirmed, public health actions need to be taken quickly to protect contacts.

e. Use the following guidelines to assist you in completing the Meningococcal Disease Case Investigation form.
   1) Accurately record the demographic information, collecting as much case information as possible, including address, place of work, occupation, and child care or school information.
   2) If the case is hospitalized, collect hospital and transfer hospital information, if applicable. Hospital laboratories, direct caregivers and infection prevention practitioners are key in obtaining information for confirming a diagnosis.
   3) Collect clinical information on the case including laboratory data, clinical manifestations, and onset date information. This information is best collected from the infection prevention practitioner at the hospital or the case's healthcare provider.

4) Collect as much information as possible about the case's activities and contacts during the 7 days prior to the onset of illness. This information may be obtained from the case, the case's family and friends, school or child care personnel, or others involved with the case. Those who meet the definition of a close contact (see Section 4B below) of a case of invasive meningococcal disease must be educated on risk of disease and the importance of receiving prophylaxis. They should immediately be referred to their healthcare provider for appropriate post-exposure antibiotic therapy. Sample letters for notifying contacts in a school, child care or office are at the end of this chapter.

f. Use the following guidelines to assist you in completing the Meningococcal Disease Case Investigation form or entering the information into the Iowa Disease Surveillance System (IDSS)
1) Specify the type of infection caused by *N. meningitidis*.
2) Indicate the type of specimen from which *N. meningitidis* was isolated/identified.
3) List the laboratory tests performed. For example, *N. meningitidis* was culture-confirmed or identified by bacterial antigen screen. Also include the date the specimen was drawn for the first positive culture.
4) If known, provide the serogroup and antibiotic resistance information.
5) If the case attends child care or school, list the child care/school name and provide a contact name and phone number.
6) If the case attends college, indicate the name of the college, the case's year in school, and the case's living situation.
7) If the case has received meningococcal vaccine, record the type of vaccine used, date administered, and reason for administration.
8) If you have made several attempts to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), call CADE and then fill out the form with as much information as you have gathered. Note on the form the reason why it could not be filled out completely. Contact CADE immediately if key information is difficult to obtain.

g. After completing the Meningococcal Disease Case Investigation form, enter information into IDSS or fax to (515) 281-5698.

h. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand and institute the control guidelines listed below in Section 4).

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

Until 24 hours after the initiation of appropriate antibiotic therapy.

Minimum Period of Quarantine of Contacts

None.

B. Chemoprophylaxis is recommended for the following:

Case:

If neither a third generation cephlosporin nor ciprofloxacin was given as treatment, patients with meningococcal invasive disease should receive antibiotic prophylaxis prior to discharge to ensure elimination of nasopharyngeal carriage

Contacts:

Because the rate of secondary disease for close contacts is highest immediately after onset of disease in the index patient, antimicrobial chemoprophylaxis should be administered as soon as possible (ideally <24 hours after identification of the index patient). Conversely, chemoprophylaxis administered >14 days after onset of illness in the index patient is probably of limited or no value.

Chemoprophylaxis is indicated for persons who in the 7 days before onset of illness or until 24 hours after the case had begun an effective antibiotic had close contact with the case. The definition of close contact is not precise but is intended to include to include persons who have had prolonged (8 hours or more) contact while in close proximity (3 feet is the general limit for large-droplet spread) to the case who have been directly exposed to the cases oral secretions. Close contact examples include:

- Household contact,
- Child care contact,
- Direct saliva contact with the case through kissing or sharing items like toothbrushes, water bottles or eating utensils,
- Mouth – to – mouth resuscitation or unprotected contact during endotracheal intubation,
- Frequently slept or ate in the same dwelling,
- Passengers seated directly next to the index case during airline flights lasting more than 8 hours, and
- Laboratory workers
    - All laboratory work with cultures of known or suspect *N. meningitidis* must be performed inside a biological safety cabinet. If a laboratory worker has been exposed via manipulating a known *N. meningitidis* culture outside of a biological safety cabinet, prophylactic antibiotic treatment is recommended to reduce the risk of infection and colonization.

Contacts who have previously received meningococcal vaccination should still receive chemoprophylaxis. Contacts should receive chemoprophylaxis as soon as possible, preferably within 24 hours after the index case has been identified, though diminishing levels of benefit may still be realized even with delays of up to 2 weeks.

Close contact does not include casual contacts at work or school or hospital employees who give routine care, even with 8 hours of contact within the previous week

Contacts of the case should be identified and referred to their healthcare provider for antibiotic prophylaxis**.**

Any contact that develops symptoms suggestive of meningococcal disease within 3-4 weeks after exposure should be evaluated promptly by a physician.

Recommendations for chemoprophylaxis are based on the assumption that persons of any age may be susceptible to meningococcal infections. Refer to table 2-4. Routine throat or nasopharyngeal culture of contacts is not helpful in determining who warrants chemoprophylaxis and unnecessarily delays the process.

Table 2-4. Chemoprophylaxis of Contacts to Meningococcal Disease

Drug Dosage	Contacts	
Rifampin*	Children <1 month	5 mg/kg BID x 2 days
	Children ≥1 month	10 mg/kg (maximum single dose 600 mg) BID x 2 days
	Adults	600 mg BID x 2 days
Ceftriaxone	Children <15 years	125 mg IM (single dose)
	Adults, teenagers ≥15	250 mg IM (single dose)
Ciprofloxacin**	Nonpregnant adults (≥18 years of age)	500 mg PO (single dose)

BID = twice daily

Note on Rifampin:

*Rifampin is not recommended for pregnant women who are contacts of cases because the effect of Rifampin on the fetus has not been established. If contact is pregnant have her contact her OB/GYN doctor immediately for consultation on appropriate antibiotic prophylaxis.

*Side effects of Rifampin include: orange discoloration of urine, discoloration of soft contact lenses (removal recommended for duration of chemoprophylaxis), decreased effectiveness of oral contraceptives, discoloration of teeth, nausea, vomiting, and diarrhea. These are uncommon when giving only 4 doses for prophylaxis.

**Ciprofloxacin is not usually recommended for persons younger than 18 years of age or for pregnant or lactating women, because studies in animals have shown it causes cartilage damage in immature animals. The drug can be used for chemoprophylaxis in children when no acceptable alternative is available. There have been no reports of irreversible adverse effects in cartilage or age-associated adverse events among children and adolescents.

Resource available at end of chapter - *Neisseria Meningitidis* Invasive Disease Chemoprophylaxis Algorithm

Rifampin Preparations for Administration (Meningococcal disease)

Persons taking rifampin should be informed that orange discoloration of urine, discoloration of soft contact lenses, and decreased effectiveness of oral contraceptives could occur.

Rifampin prophylaxis is best administered through the private physician and local pharmacy. However occasionally help must be given, i.e., contact has no doctor, pharmacy closed or has no rifampin. In these cases, call CADE. Dosages are calculated on weight and a prescription label with directions should accompany any rifampin dispensed.

There are two satisfactory procedures for the administration of rifampin to young children.

1. Rifampin Suspension may be available at the local pharmacy. When stored in the refrigerator, this suspension is stable for six weeks. In order to assure a uniform dosage, it is extremely important to shake the suspension vigorously just before the administration of each dose to the patient.

2. Applesauce Mix*

- Empty the contents of one rifampin 300 mg capsule in six teaspoons of applesauce and mix thoroughly (preparation contains 50 mg/5 ml or per teaspoon).
- Dosage must be calculated and family counseled on number of teaspoons to administer.
- Unused applesauce mixed with rifampin should be immediately discarded. New applesauce-rifampin mix should be made for each dose.

*Preparation of Choice

Note: Rifampin administration has not been approved in any other preparation or solution.

If the contact's healthcare provider is not available, contact the local board of health physician or CADE for assistance.

C. Managing Special Situations

Child Care

Please contact CADE (800) 362-2736 immediately to discuss.

A case of invasive meningococcal illness in a child care setting often causes panic among parents and the community. Although the risk of transmission in this setting remains relatively low, chemoprophylaxis for all the children in the child care class or the child care facility may be recommended because the physical interactions between young children often involve direct saliva contact.

Chemoprophylaxis is recommended for:

1. All children and employees in child care who have had direct saliva contact or have been in the same classroom for greater than 8 hours with the case in the week before onset or until 24 hours after the case was started on an effective antibiotic.
2. Chemoprophylaxis is not routinely recommended for children in the same classroom of the case who have not had direct saliva contact or greater than 8 hours contact with the case in the previous week.

Surveillance for additional cases of disease should also be heightened. Contact the CADE to report suspect or confirmed cases in a child care (or any other setting). An epidemiologist will work to ensure contacts are identified and notified. In addition, surveillance for new cases of disease should continue at the facility for at least 2 incubation periods (20 days) after the onset of the first case. If multiple cases occur, contact CADE immediately and continue surveillance for 2 incubation periods after the onset of the last case.

Resources at end of section:

- Fact Sheet for DCC Administrators
- Parent and Employee Advisory Letter, Meningococcal Disease in a Child Care Center (case reported within 14 days after case's last day in child care)
- Parent and Employee Advisory Letter, Meningococcal Disease in a Child Care Center (case reported more than 14 days after case's last day in child care)

School

A case of invasive meningococcal illness in a school often causes panic among parents and the community. Although the risk of transmission in a school remains relatively low, the age and activities of the case will determine the extent of chemoprophylaxis necessary. Because the physical interactions between children often involve direct saliva contact, chemoprophylaxis for all the children in the case's class may be recommended, i.e. mentally handicapped students or very young children. An elementary, high school, or college student usually has a more defined group of close contacts and chemoprophylaxis may be more targeted.

Careful assessment and identification of contacts is needed to define the scope of chemoprophylaxis recommended. An epidemiologist will work with the local health agency to ensure an assessment and identification of contacts is completed and those needing post exposure prophylaxis are notified. Surveillance for additional cases of disease should also be heightened. Contact CADE to report suspect or confirmed cases. In addition, surveillance for new cases of disease should continue at the school for at least 20 days after the onset of the case. If multiple cases occur, contact CADE immediately and continue surveillance for 2 incubation periods (20 days) after the onset of the last case.

Community Residential Program

If a case of meningococcal disease occurs in a residential program, close contacts of the case should be referred to their healthcare provider for chemoprophylaxis. The activity in the facility should be assessed to determine the level of interaction between residents. The facility may be considered a "household setting" and require chemoprophylaxis of all residents, or the chemoprophylaxis may be more targeted. Contact the CADE for assistance in following up a case of invasive meningococcal

disease in residential programs. In addition, surveillance for new cases of disease in the facility should continue for at least 2 incubation periods (20 days) after the onset of the first case. If multiple cases occur, contact CADE immediately and continue surveillance for 2 incubation periods after the onset of the last case.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in a jurisdiction is higher than usual for the time of year, or if an outbreak is suspected, contact CADE immediately at (800) 362-2736. This situation may warrant an investigation of clustered cases to determine a course of action to prevent further cases. The IDPH can perform surveillance for clusters of illness that may cross several county lines and therefore be difficult to identify at a local level. To assist in outbreak identification, it is critical that all invasive site *Neisseria meningococcal* isolates are sent to State Hygienic Laboratory (SHL) for serogrouping.

D. Preventive Measures

Personal Preventive Measures/Education

To prevent additional cases:

- Refer close contacts to healthcare providers for appropriate chemoprophylaxis.
- Advise contacts of signs and symptoms of illness and refer them to their healthcare provider should they experience any symptoms compatible with invasive meningococcal disease.
- Provide contacts with a *Meningococcal Disease Fact Sheet.*

To avoid future exposures, advise individuals to:

- Practice good hygiene and handwashing technique.
- Avoid sharing food, beverages, cigarettes or eating utensils.
- Consider immunization in certain circumstances (see below).

Immunization

Two vaccines protecting against four serogroups (A, C, Y, and W-135) of *N. meningitidis* are available. All 11-12 years olds should be vaccinated with meningococcal conjugate vaccine (MCV4). A booster dose should be given at age 16 years. For adolescents who receive the first dose at age 13 through 15 years, a one-time booster dose should be administered, preferably at age 16 through 18 years, before the peak in increased risk. Adolescents who receive their first dose of MCV4 at or after age 16 years do not need a booster dose.

The Advisory Committee on Immunization Practices (ACIP) recommends that a student entering college get a booster dose of vaccine if they received the vaccine more than 5 years before starting college or if they never received one.

The vaccine is also recommended for travelers to countries where meningitis is endemic, certain high-risk individuals (those with terminal complement component deficiencies and those with anatomic or functional asplenia), laboratory personnel who are exposed routinely to *N. meningitidis* in solution that may be aerosolized, college freshman living in dormitories, military recruits, and in the case of an outbreak of invasive disease.

Meningococcal conjugated vaccine (MCV4) is preferable to meningococcal polysaccharide vaccine (MPSV4) for vaccination of children aged 2-10 years who are at increased risk for meningococcal disease. These children include travelers to or residents of countries in which meningococcal disease is hyperendemic or epidemic, children who have terminal complement component deficiencies and children who have anatomic or functional asplenia. Additionally, MCV4 is preferred to MPSV4 for use among children aged 2-10 years for control of meningococcal disease outbreaks.

The ACIP recommends that healthcare providers of college students provide information to students and their parents about meningococcal disease and the benefits of vaccination. In particular, vaccination should be made easily available to freshman students, (especially those living in group settings like dorms). Iowa law requires that colleges with on campus housing educate incoming students on the vaccine.

N. meningitidis is spread through direct contact with oral or nasal secretions of a carrier. A closed setting such as a college dormitory, combined with high-risk behaviors in college students (alcohol consumption, exposure to tobacco smoke, sharing food or beverages, activities involving the exchange of saliva, etc.), may cause some college students to be at greater risk for invasive infection. Healthcare providers should discuss these risk factors and the likelihood that their patients will be involved in high-risk behaviors when evaluating patients for the administration of meningococcal vaccine.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Meningitis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Comment

- Positive antigen test results from urine or serum samples are unreliable for diagnosing meningococcal disease, but can be used to assist in diagnosis if a positive result is obtained.

References

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CDC, *Laboratory-Acquired Meningococcal Disease* – United States, 2000, MMWR, February 22, 2002; 51:7
Gardner, P., Prevention of Meningococcal Disease, The New England Journal of Medicine, October 5, 2006
Raghuanthan, P. L., Bernhardt, S. A., Rosenstein, N. E., Opportunities for control of meningococcal disease in the United States. Annu. Rev. Med. 2004. 55:333–53
Sejvar, James J., et al., *Assessing the Risk of Laboratory-Acquired Meningococcal Disease*, Journal of Clinical Microbiology, September 2005 4811-4814

Additional Resources

CDC. *Epidemiology and Prevention of Vaccine-Preventable Diseases.* (The Pink Book), 12th ed. Washington DC: Public Health Foundation, April, 2011.
www.cdc.gov/vaccines/pubs/pinkbook/downloads/mening.pdf
National Foundation for Infectious Diseases, The Changing Epidemiology of Meningococcal Disease Among U.S. Children, Adolescents and Young Adults, November, 2004
www.nfid.org/pdf/meningitis/FINALChanging_Epidemiology_of_Meningococcal_Disease.pdf
CDC. Meningitis vaccination website. www.cdc.gov/vaccines/vpd-vac/mening/default.htm

Neisseria meningitidis Invasive Disease Chemoprophylaxis

Prophylaxis

- Household contacts
- Direct Saliva Contact
- Child care attendees
- Laboratory workers at risk

No Prophylaxis

- Casual Contacts at work or school
- Hospital employees who give routine care

Chemoprophylaxis is indicated for persons having household-like and or direct saliva contact with the case in the week before onset or until 24 hours after the case has begun an effective antibiotic. Chemoprophylaxis is also indicated for laboratory workers who have manipulated a known *N. menigitidis* culture outside of a biological safety cabinet.

Chemoprophylaxis should be initiated within 24 hours of case identification, but no later than 14 days after exposure.

Vaccine is used in outbreak situations, not for postexposure chemoprophylaxis
Questions? Call 1.800.362.2736

FACT SHEET MENINGOCOCCAL INVASIVE DISEASE
FOR CHILD CARE ADMINISTRATORS

What is meningococcal invasive disease?
Meningococcal invasive disease, including meningitis, is a serious and potentially lethal infection. Meningococcal disease has caused numerous epidemics in the past, but currently in the U.S., outbreaks are sporadic and rare. In the U.S., approximately 2000-3000 cases of meningococcal disease are reported annually and approximately 10% of the cases die. Iowa averages 29 cases and 3 deaths per year. Meningococcus can affect persons of any age. Children less than 2 years of age are most often affected, however almost one half of cases occur in persons over 15 years old.

How is meningococcal invasive disease spread?
Many healthy children and adults unknowingly carry meningococcal bacteria in their nose and throat without any symptoms. Usually, the bacteria stay in the nose and throat for a while and will then disappear. The bacteria are spread from person-to-person by direct contact with the organisms found in nose and throat secretions. This typically requires prolonged direct contact or direct saliva contact. The reason that the organism disappears in some people and produces illness in others is not clearly understood but is probably related to individual susceptibility.

What are symptoms of meningococcal invasive disease?
Symptoms of meningococcal invasive disease include a sudden onset of high fever, irritability, and lethargy. If meningitis develops, intense headache, nausea, vomiting, stiff neck, or a bulging soft spot (in infants) is typically present. A generalized rash may also be present.

How common is meningococcal invasive disease in child cares?
Clusters of meningococcal disease in child care rarely occur. The risk of spread at child care is about 1%, however, due to the severity of the illness and high mortality of cases, preventive measures are recommended for any contacts of a case.

What is the treatment for exposure to meningococcal invasive disease?
Specific antibiotics eliminate the organism from the nose and throat of persons carrying it, reducing the risk of contacts developing a serious infection. Antibiotics are recommended for all child care (usually only classroom) contacts (adults or children) having close or direct saliva contact with the case in the week prior to onset of illness or hospitalization. Antibiotics are not recommended for non-classroom contacts who have had only brief, casual contact with the case.

Rifampin is the treatment of choice for person less than 18 years of age. Persons who are known to be allergic to rifampin, and women who are pregnant or who might be pregnant should not take rifampin. However, other antibiotics may be used in these circumstances. Persons wearing soft contact lenses should remove the lenses for the two day treatment period as rifampin may discolor them. Rifampin will turn the urine a reddish-orange color and may decrease the effectiveness of birth control pills.

For further information, contact your local health department or the Iowa Department of Public health, CADE at (800) 362-2736.

FACT SHEET MENINGOCOCCAL DISEASE

(Spinal meningitis, Meningococcemia, Neisseria meningitis)

What is meningococcal disease?
Meningococcal disease is a severe bacterial infection of the blood and meninges (the thin covering of the brain and spinal cord). It is a relatively rare disease.

What are the symptoms of meningococcal disease?
Infection with the bacteria can cause fever, headache, nausea, vomiting, rash, a stiff neck and occasionally death.

How soon do symptoms appear?
The symptoms may appear 2 - 10 days after infection, but usually about 3 - 4 days after exposure.

How is meningococcal disease spread?
Meningococcal disease spreads by contact with mucus or droplets from the nose and throat of an infected person. Meningitis and septicemia (an infection of the blood) caused by *N. meningitidis* can be spread by direct contact with saliva, such as kissing or sharing items like eating utensils, drinks or cigarettes. Pneumonia caused by *N. meningitidis* can also be transmitted by droplets. Some people carry the bacteria in their nose and throat without any signs of illness, while others may develop serious symptoms.

Who gets meningococcal disease?
Anyone, but it is more common in infants, children and young adults.

How long is a person infectious?
A person may spread the disease from the time they are first infected until the germ is no longer present in discharge from the nose and throat. The bacteria usually disappear from the throat and nose 24 hours after appropriate antibiotics are started.

What is the treatment for meningococcal disease?
Antibiotics. Once the initial infection is treated, the person may also need another antibiotic to clear the bacteria from the nose and throat and reduce the chances of spreading it to others.

Can a person get this disease again?
Probably not.

Do infected people need to be excluded from school, work, or child care?
Yes, people with meningitis should be excluded from public places until a doctor says it is OK to return.

Should people who have been around a person infected with meningococcal disease be treated?
Household members, child care center attendees and staff, and close friends of infected persons need to ask their doctor about antibiotics. Persons who have had casual contact such as sitting or standing next to someone in a classroom, office or factory do not need treatment.

Is there a vaccine to prevent meningococcal disease?
Yes. Two vaccines protecting against most strains of *N. meningitidis* are available. A dose of vaccine is recommended for persons 11-12 years of age or on entry into high school. A booster dose should be given at age 16 years. A student entering college should get a dose of vaccine if they received the vaccine more than 5 years before starting college or had never received one.

The vaccine is also recommended for travelers where the disease is common and certain high-risk individuals, including laboratory personnel who are exposed routinely to *N. meningitides*, college freshman living in dormitories, and military recruits. For more information, contact your physician or county health department.

What can be done to help prevent the spread of meningococcal disease?
Anyone with cold- or flu-like symptoms should cough or sneeze into a disposable tissue or into their sleeve. Do not share food, drink, eating utensils or cigarettes with others. Frequent handwashing is always helpful in reducing the chances of catching diseases.

Note: Sample letter to be adapted on Local or state health department letterhead and to be used when case is reported within 14 days after case's last day in child care.

PARENT AND EMPLOYEE ADVISORY LETTER
Meningococcal Disease in a Child Care Center

Dear Parents of (name of child):

Your child has been in contact with a child who has been diagnosed as having [(meningococcal meningitis) or (a serious meningococcal infection) - use applicable description]. The disease is caused by bacteria that can cause an infection or meningitis in people of any age. Persons who have had close, personal contact to a person with a meningococcal infection have a slight risk of developing a serious infection. **Because your child was in the same classroom with the child with the meningococcal infection the week before illness, the Iowa Department of Public Health and the _____ Health Department recommend that your child take an antibiotic, called rifampin.** Rifampin eliminates the bacteria from the nose and throat of persons carrying it, which may help protect contacts from developing a serious meningococcal infection. Please contact your private physician to obtain this medication for your child. Persons who are known to be allergic to rifampin and women who are pregnant or who might be pregnant should not take rifampin, however other antibiotics may be used in these circumstances. Persons wearing soft contact lenses should remove the lenses for the two day period as rifampin may discolor them. Rifampin will turn the urine a reddish-orange color. Rifampin may also decrease the effectiveness of birth control pills.

Watch for the following signs of infection in your child: fever, severe headache, stiff neck, nausea, vomiting or rash. If your child develops any of these symptoms in the next few weeks, you should contact his/her health care provider, explain the symptoms and tell the health care provider that your child was in contact with a child who had [(meningococcal meningitis) or (a serious meningococcal infection)].

Please feel free to contact the _____ Health Department at (telephone number) or the Iowa Department of Public Health, Center for Acute Disease Epidemiology (CADE) at (800)362-2736 if you have questions regarding this subject.

Note for child care employees: Employees having greater than 8 hours household-like and or direct saliva contact with the child with meningococcal disease in the week before illness should also receive an antibiotic. Meningococcal disease can affect persons of all ages.

Sincerely,

_____ _____
(Name) (Local Health Department)

NOTE FOR YOUR DOCTOR: Rifampin for prevention of meningococcal disease is 10 mg/kg twice daily for 2 days (maximum dose 600 mg/dose or 1200 mg/day); for infants <1 month of age, 5 mg/kg twice daily for 2 days. Ciprofloxacin 500 mg orally once for nonpregnant persons 18 or older or Ceftriaxone 125 mg IM once for persons up to age 15, for those ≥15 years of age 250 mg IM once.

Meningococcal, invasive disease

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name: Facility phone: ( )- - Type:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Onset date: / / Diagnosis date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of death / /
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Event exception ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider type: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Specimen source: Result: ☐ Positive ☐ Negative ☐ No growth
Date received: / / Test type: ☐ PCR ☐ Gram stain ☐ Culture Serogroup: ☐ A ☐ B ☐ C ☐ W-135 ☐ Y
Result type: ☐ Preliminary ☐ Final Collection date: / /
Accession #: Result date: / / Organism: ***Neisseria meningitidis***

Laboratory: Specimen source: Result: ☐ Positive ☐ Negative ☐ No growth
Date received: / / Test type: ☐ PCR ☐ Gram stain ☐ Culture Serogroup: ☐ A ☐ B ☐ C ☐ W-135 ☐ Y
Result type: ☐ Preliminary ☐ Final Collection date: / /
Accession #: Result date: / / Organism: ***Neisseria meningitidis***

Laboratory: _____ Specimen source: _____ Result: ☐ Positive ☐ Negative ☐ No growth

Date received: / / Test type: ☐ PCR ☐ Gram stain ☐ Culture Serogroup: ☐ A ☐ B ☐ C ☐ W-135 ☐ Y

Result type: ☐ Preliminary ☐ Final Collection date: / /

Accession #: Result date: / / Organism: ***Neisseria meningitidis***

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

OTHER DEMOGRAPHIC INFO

Attending a college or university: ☐ Yes ☐ No ☐ Unk College/University name: _____

Student status: ☐ Active ☐ Inactive Year in college: ☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior ☐ Grad student

Housing: ☐ Other ☐ Apartment ☐ Dormitory ☐ Single-family home with family ☐ Single-family home with students

CLINICAL INFO & DIAGNOSIS

Purpura fulminans present: ☐ Yes ☐ No ☐ Unk

Antibiotic resistance testing performed: ☐ Yes ☐ No ☐ Unk

Resistant to ampicillin: ☐ Yes ☐ No ☐ Unk
Resistant to chloramphenicol: ☐ Yes ☐ No ☐ Unk
Resistant to rifampin: ☐ Yes ☐ No ☐ Unk
Resistant to sulfa: ☐ Yes ☐ No ☐ Unk

Infection type: ☐ Bacteremia ☐ Meningitis ☐ Pericarditis ☐ Peritonitis ☐ Pneumonia ☐ Other

Other infection type (specify): _____

Spinal tap ☐Yes ☐No ☐ Unk
Date: ____/____/____
Normal: ☐Yes ☐No ☐ Unk
Spinal fluid protein level: _____
Unit: ☐ mg/dL ☐ g/L ☐ µmol/L
Spinal fluid glucose level: _____
Unit: ☐ mg/dL ☐ µmol/L
White blood count: _____
Unit: ☐ cells/mm3 ☐ cells/mL

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

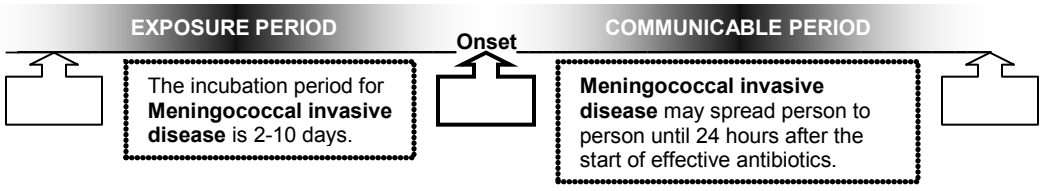
Antibiotic: _____
Date started: ____/____/____
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of times a day: _____ Route: _____

Antibiotic: _____
Date started: ____/____/____
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of times a day: _____ Route: _____

Antibiotic: _____
Date started: ____/____/____
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of times a day: _____ Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated for meningococcal: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: ____/____/____
Lot #: _____
Vaccine type: _____
Manufacturer: _____

Date vaccinated: ____/____/____
Lot #: _____
Vaccine type: _____
Manufacturer: _____

Number of vaccinations: ____

CONTACTS

Number of people living in case's household: ____

Additional close contacts of the case: ☐ Yes ☐ No ☐ Unknown

Close contacts of the case

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	_____ Zip code: Phone: - -

Relationship to case	List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian ☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other	_____	/ /	☐ Yes ☐ No

Post exposure prophylaxis given? ☐ Yes ☐ No ☐ Unk

Antibiotic:	Date started:	Dose:	Unit:	# of days:	# times/day:	Route:
_____	/ /	_____	☐ mg ☐ ml ☐ IU	_____	_____	_____

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone		
	/ /	☐ Male ☐ Female	______________________	Zip code:	Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

Post exposure prophylaxis given? ☐ Yes ☐ No ☐ Unk

Antibiotic:	Date started:	Dose:	Unit:	# of days:	# times/day:	Route:
______________	/ /	______	☐ mg ☐ ml ☐ IU	________	_________	______________

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone		
	/ /	☐ Male ☐ Female	______________________	Zip code:	Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

Post exposure prophylaxis given? ☐ Yes ☐ No ☐ Unk

Antibiotic:	Date started:	Dose:	Unit:	# of days:	# times/day:	Route:
______________	/ /	______	☐ mg ☐ ml ☐ IU	________	_________	______________

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone		
	/ /	☐ Male ☐ Female	______________________	Zip code:	Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

Post exposure prophylaxis given? ☐ Yes ☐ No ☐ Unk

Antibiotic:	Date started:	Dose:	Unit:	# of days:	# times/day:	Route:
______________	/ /	______	☐ mg ☐ ml ☐ IU	________	_________	______________

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone		
	/ /	☐ Male ☐ Female	______________________	Zip code:	Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

Post exposure prophylaxis given? ☐ Yes ☐ No ☐ Unk

Antibiotic:	Date started:	Dose:	Unit:	# of days:	# times/day:	Route:
______________	/ /	______	☐ mg ☐ ml ☐ IU	________	_________	______________

If this contact is a case create a new event and/or case for this contact.

NOTES:

MUMPS

Also known as: Infectious Parotitis

Responsibilities:
Hospital: Report by IDSS, facsimile, phone or mail
Lab: Report by IDSS, facsimile, phone or mail
Physician: Report by facsimile, phone or mail
Local Public Health Agency (LPHA): Report by IDSS, facsimile, phone or mail.
Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Mumps is caused by the mumps virus (genus *Paramyxovirus*, family *Paramyxoviridae*).

B. Clinical Description

Mumps is a systemic disease characterized by swelling of the salivary glands, which usually lasts several days. However, about one-third of infections do not cause clinically apparent salivary gland swelling. Respiratory symptoms are common. Encephalitis occurs rarely, and permanent sequelae or death is uncommon. Infection in adulthood is likely to produce a more severe disease, including mastitis, which occurs in up to 31% of females aged > 15 years, and orchitis, which occurs in 20% – 30% of post-pubertal males. Other rare complications include arthritis, renal involvement, myocarditis, cerebellar ataxia, pancreatitis, and hearing impairment. Mumps infection during the first trimester of pregnancy can increase the risk of spontaneous abortion, although no evidence exists that it causes congenital malformations. While death due to mumps is rare, more than half the fatalities occur in those $\geq$ 19 years of age.

Mumps should not be ruled out in someone who is vaccinated if he or she has clinically consistent symptoms.

Note: Swelling of the salivary glands can also be caused by infection with cytomegalovirus, parainfluenza virus types 1 and 3, influenza A, Coxsackie A, echovirus, lymphocytic choriomeningitis virus, HIV, and non-infectious causes such as drugs, tumors, immunologic diseases, and obstruction of the salivary duct.

C. Reservoirs

Humans are the only known reservoirs.

D. Modes of Transmission

Mumps is transmitted by droplet or direct contact with nasopharyngeal secretions of an infected person, and by the airborne route.

E. Incubation Period

The incubation period is usually 16 – 18 days, with a range of 12 – 25 days

F. Period of Communicability or Infectious Period

Virus has been isolated from saliva (from 7 days before the onset of parotitis to 9 days afterwards) and from urine (six days prior to fifteen days after). Infectiousness occurs between 3 days before

symptom onset until four days after or until symptoms resolve. Unapparent infections can be communicable.

G. Epidemiology

Mumps occurs worldwide. In the United States, it is endemic year-round, historically peaking in winter and spring; however seasonality no longer is evident, due to widespread immunization. Eighty-five percent of adults have serologic evidence of immunity. About one-third of the infections do not cause apparent parotitis but those infected can still transmit disease; most infections in children < 2 years of age are subclinical. The incidence of mumps in the U.S. has declined since the vaccine came into use in 1967. In 1986 and 1987, there was a relative resurgence of mumps, apparently due to the absence of comprehensive state immunization requirements as well as, in some instances, vaccine failure. The number of mumps cases reported in the U.S. declined steadily from 1989 to 2005, but a multi-state outbreak of Mumps in 2006 resulted in over 6000 reported cases, including almost 2000 cases in Iowa. Outbreaks in highly vaccinated populations still occur, probably due to vaccine mismanagement or vaccine failure.

H. Bioterrorism Potential

None

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider report. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. After completing the investigation and gathering the information to complete the investigation form, enter information into the Iowa Disease Surveillance System (IDSS), or FAX the report form with supporting laboratory documentation to (515) 281-5698 or mail (in an envelope marked "Confidential") to the IDPH/CADE, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

A. What to Report to the Iowa Department of Public Health

- A suspect or confirmed case of mumps, as diagnosed by a healthcare professional, or
- Isolation of mumps virus from clinical specimen, or
- Significant rise between acute and convalescent phase titers in serum mumps IgG antibody level by any standard serologic assay, or
- Positive serologic test for mumps IgM antibody.

B. Laboratory Testing Services Available

- Laboratory tests should be conducted on anyone with symptoms compatible with mumps without other apparent cause, regardless of vaccination history.
- All specimens described below should be obtained for all patients with suspected mumps.

1) **Testing for Mumps Virus:** The specimen should reflect the pathology of disease. Specimens sent to the University of Iowa State Hygienic Lab (SHL) should be submitted with a completed SHL "Viral Test" request form. Test request forms and specimen collection and shipment instructions can be found at the SHL web site at www.shl.uiowa.edu/kitsquotesforms/ . Unlabeled specimens will not be tested.

Parotid gland duct swab for polymerase chain reaction testing (in M4 viral transport medium) may be collected from date of onset of symptoms to 9 days after onset of symptoms. Massage the parotid (salivary) glands for 30 seconds prior to swabbing the buccal cavity (the space near the upper rear molars between the check and the teeth). Place swab into M4 Viral Transport Medium and do not remove swab. Specimen must be stored and shipped cold (on ice packs). Laboratories have M4 transport tubes available in the SHL Biodefense kits (blue box), herpes kits, and virus isolation kits.

2) Serologic Testing: collect 7-10 ml blood in a red top or serum separator tube (SST) with a completed SHL Serology Test Request form and ship either **a)** with culture specimens cold (on ice packs) or, **b)** at ambient temperature. Test request forms and instructions for collection and shipment of specimens can be found at the SHL web site at www.shl.uiowa.edu/kitsquotesforms/. Serum for mumps virus IgM should be collected 3 to 5 days after symptom onset. Mumps virus IgM peaks at 1 – 2 weeks after symptom onset.

Contact SHL at (319) 335-4500 to request test kits, specimen collection instructions, test request forms, and shipping instructions or visit www.shl.uiowa.edu

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify cases and susceptible exposed people rapidly and to prevent further spread of the disease.
- To confirm mumps infection as the cause of glandular swelling/pain.
- To distinguish between failure to vaccinate and vaccine failure and development of a plan to address the problems.

B. Initial Questions to Ask Healthcare Provider and Patient

To assess the likelihood that a suspect case is a true case prior to laboratory testing, LPHA and/or other public health staff helping in the investigation should ask about: 1) symptoms, 2) mumps immunization history, 3) recent history of dental work, 4) recent history of travel (to where and dates), 5) whether there were any recent out-of-town visitors (from where and dates), and 6) whether there was any recent contact with anyone with similar symptoms.

4) CONTROLLING FURTHER SPREAD

This section provides detailed control guidelines that are an integral part of case investigation.

A. Minimum Period of Isolation of Patient

From day of onset of symptoms to 4 days after (This includes the first day of symptoms as day zero; totaling 5 days after the onset of symptoms as the period of communicability.)

B. Protection of Contacts of a Case (includes outbreak situations)

Identify and immunize susceptible people within the same community. Susceptible persons are defined as those who have not had two MMRs or MMRVs. Note: mumps (MMR or MMRV*)* vaccination will not prevent infection in a person who has been recently exposed, but vaccinating may prevent future outbreaks.

- Case: Exclude through 5 days after onset of symptoms (counting the day of symptom onset as day zero). The suspect case may return to normal activities on the 6th day or once symptoms have resolved, whichever is later.
- Contacts: All contacts should be evaluated for vaccination status. If a person does not have 2 doses, refer for vaccination. If person has a contraindication or refuses vaccination, educate on personal protective measures and symptoms of mumps. Contacts may continue normal activities in the absence of symptoms. Note: mumps (MMR or MMRV) vaccination will not prevent infection in a person who has been recently exposed, but vaccinating may prevent future outbreaks.

1. Conduct active surveillance for mumps for 2 incubation periods (50 days) after onset of the last case.
2. Mumps vaccine, preferably MMR or MMRV, should be administered to all susceptible persons. As with any vaccine, there will be some individuals who will not gain immunity after the receipt of the mumps vaccine. Because effectiveness is not 100%, a second dose of mumps-containing vaccine is recommended for individuals who have previously received only one dose. Furthermore, birth before 1957 does not guarantee mumps immunity, thus mumps vaccine should be considered for those born before 1957, especially in outbreak situations.

C. Managing Mumps in Healthcare Settings

1. Proof of immunity: Birth in the U.S. before 1957 does not guarantee mumps immunity. Therefore, all healthcare workers should have documentation of at least one dose, preferably two doses, of mumps-containing vaccine on or after the first birthday or serologic proof of immunity. An effective routine MMR or MMRV vaccination program for healthcare workers (in addition to standard precautions) is the best approach to prevent nosocomial transmission.
2. Isolation of patients:
   - Patients should be placed on Droplet Precautions for the duration of their hospitalization. Unusual circumstances may need consultation with the Iowa Department of Public Health.
   - Exposed susceptible patients should be placed on Droplet Precautions from the 12th day after the earliest exposure through the 26th day after the last exposure. They may be taken off precautions on the 27th day.
3. Exclusion of staff:
   - Personnel who become sick should be excluded from work at least 5 days after the onset of symptoms (counting the day of symptom onset as day zero) or until symptoms resolve, whichever is later. These staff should be excluded from high-risk (i.e. patient's requiring a protective environment such as cancer unit, burn unit, bone marrow recipients, special-care nursery) patient contact at least 9 days after the onset of symptoms (counting the day of symptom onset as day zero) or until symptoms resolve, whichever is later.
   - Personnel who have been exposed to a mumps case and are susceptible (have no serological evidence of immunity) should be vaccinated and should remain home from the 12th day after the 1st exposure through the 26th day after their last exposure. Consult with IDPH for special situations.
     Note: All new staff should be assessed for mumps immunity.
4. Surveillance: Conduct active surveillance for mumps for 2 incubation periods (50 days) after onset of the last case.

D. Preventive Measures

Personal Preventive Measures/Education

Vaccination with MMR or MMRV of all susceptibles is the best preventive measure against mumps. Susceptibles are defined as anyone who has not had 2 doses of MMR or MMRV. Good personal hygiene (which consists of proper hand hygiene, disposal of used tissues, not sharing eating utensils, etc.) is also important. For more information on the measles, mumps and rubella vaccine, see the ACIP vaccine information statement.

Additional Information

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Mumps can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *Red Book 2003: Report of the Committee on Infectious Diseases, 26th Edition.* Illinois, American Academy of Pediatrics, 2003.

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CDC. Updated Recommendations for the Isolation of Persons with Mumps. *MMWR.* 2008, 57(40); 1103-1105

CDC. *Manual for the Surveillance of Vaccine-Preventable Diseases*, CDC, 2002.

CDC. Measles, Mumps, and Rubella—Vaccine Use and Strategies for Elimination of Measles, Rubella, and Congenital Rubella Syndrome and Control of Mumps. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR.* 1998, 47:RR-8.

Heymann, D.J., ed. *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

CDC. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Tenth Edition. March, 2008.

FACT SHEET

MUMPS
(Infectious parotitis)

What is mumps?
It is an infection caused by the mumps virus.

How is mumps spread?
Mumps is spread by airborne transmission with mucus or droplets from the nose or throat of an infected person, usually when a person coughs or sneezes.

Who gets mumps?
Anyone, but it is more common in infants, children and young adults. Of people who are not immunized, >85% will have mumps by adulthood, but symptoms may have been mild and therefore not recognized.

What are the symptoms of mumps?
The most common symptoms are fever, headache, and swollen salivary glands under the jaw. The disease can lead to hearing loss, aseptic meningitis (infection of the covering of the brain and spinal cord) and, in 20% to 30% of males who have reached puberty, the disease can cause painful, swollen testicles.

How soon do symptoms appear?
They may appear 12 - 25 days after infection, but usually within 18 days.

How long is an infected person able to spread the disease?
A person can spread disease from 3 days before they become ill until four days after or until symptoms resolve. Unapparent infections can be communicable.

What is the treatment for mumps?
There is no specific treatment. Supportive care should be given as indicated.

Is there a vaccine to prevent mumps?
Yes. Two doses of mumps-containing vaccine, given as combination MMR vaccine, separated by at least 4 weeks, are routinely recommended for all children. The first dose is given on or after the first birthday; the second is given at 4 - 6 years of age. MMR is a live, attenuated vaccine. Pregnant women and persons with immunodeficiency or immunosuppression should not receive live attenuated vaccines.

What can be done to stop the spread of mumps?
Anyone with mumps should not go back to child care, school, work, or other public places until 5 days after symptoms began or until they are well whichever is longer. People who are contacts to a mumps case should have their immunization status evaluated. Anyone who is not immune and has not received 2 doses of a mumps-containing vaccine should be vaccinated. Persons who may have been exposed should be educated on the signs and symptoms of mumps disease and should seek medical attention as soon as any of these symptoms begin.

Mumps

Agency: ______
Investigator: ______ Phone number: ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______
First and middle name: ______
Maiden name: ______ Suffix: ______
Address line: ______
Zip: ______ City: ______
State: ______ County: ______
Phone: ( )- - Type: ______
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ______

Date of Birth: / / Estimated? ☐ Age: ______
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ______
Parent/Guardian phone: ( )- - Type: ______

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom: ______
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ______ Country: ______

Healthcare provider information

Last name: ______
First name: ______
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - Type: ______

LABORATORY FINDINGS

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Mumps virus*** Type (e.g. serotype):

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Mumps virus*** Type (e.g. serotype):

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Mumps virus*** Type (e.g. serotype):

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Classic symptoms

Swelling OR pain of parotid gland: ☐ Yes ☐ No ☐ Unk
Swelling OR pain of sublingual or submandibular (submaxillary) glands: ☐ Yes ☐ No ☐ Unk
Did the glandular swelling or pain last at least 2 days: ☐ Yes ☐ No ☐ Unk

Other symptoms

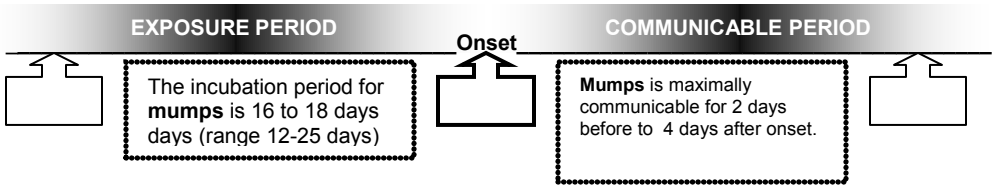
☐ Fever
☐ Orchitis
☐ Parotitis
☐ Swollen lymph nodes

Complications

☐ Aseptic meningitis
☐ Deafness

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

If pregnant during illness, how many weeks gestation was case at time of onset: _____

Vaccinated for mumps: ☐ Yes ☐ No ☐ Unknown

Date vaccinated:	/ /	Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:		Lot #:	
Vaccine type:		Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:		Manufacturer:	

Number of vaccinations: ____

If not vaccinated, reason: ☐ Lab evidence of previous disease ☐ Religious exemption ☐ Other ☐ Medical contraindication ☐ Under age 7 months ☐ Unknown ☐ Parental refusal

Transmission setting: ☐ Day care ☐ School ☐ Doctor's office ☐ Hospital ward ☐ Hospital ER ☐ Hospital outpatient clinic ☐ Home ☐ Work ☐ Unknown ☐ College ☐ Military ☐ Correctional facility ☐ Church ☐ International travel ☐ Other

Disease traced within 2 generations of known international import? ☐ Yes ☐ No ☐ Unk

Risk Factors/Travel Information – *In the 5 days prior to onset of symptoms had the case:*

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:	Departure date: / /	Return date: / /
Traveled within U.S.? ☐ Yes ☐ No ☐ Unk	State: City:	Departure date: / /	Return date: / /
Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:	Departure date: / /	Return date: / /

CONTACTS

Number of people living in case's household: ____

Are there close contacts of the case with similar symptoms: ☐ Yes ☐ No ☐ Unknown

Close contacts with similar symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES: _____

Diseases O-P

PERTUSSIS

Also known as: Whooping Cough

Responsibilities:
Hospital: Report by IDSS, facsimile, phone, or mail
Lab: Report by IDSS, facsimile, phone, or mail
Physician: Report by facsimile, phone, or mail
Local Public Health Agency (LPHA): Report by IDSS, **Follow-up required**

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Pertussis is caused by *Bordetella pertussis*, a gram-negative bacillus.

B. Clinical Description

Symptoms: Pertussis symptoms may vary by illness stage as described below:

- ***Catarrhal stage***: This is the most contagious stage of pertussis. The illness begins insidiously, similar to a common cold, with cough, sneezing, and/or a runny nose, sometimes lasting up to two weeks.
- ***Paroxysmal stage***: The classic symptoms start with a whooping cough of five to 15 consecutive coughs per single breath, followed by a high-pitched whoop as the person deeply inhales. Moments later another round of coughing occurs, sometimes accompanied by gagging and vomiting. The infected person usually appears normal between attacks. The cough is usually worse at night. Fever is most often absent or minimal throughout the course of the disease. The paroxysmal stage can last one to six weeks.
- ***Convalescent stage*****:** This stage can persist for three weeks to three months (seven weeks on average). Even after recovery, classic coughing episodes may recur for months. This is usually because the person is developing another upper respiratory infection that may irritate the previously damaged airways.

The clinical presentation of pertussis is variable and its diagnosis challenging.

- Infants under six months old may present with apnea and cyanosis rather than a whooping cough, and usually appear quite ill.
- Older children and adults also can have atypical manifestations, with persistent cough lasting > two weeks with no whoop, or they may present with more classical symptoms. They may also present with milder symptoms that mimic bronchitis or asthma.

Onset: Pertussis onset is acute or insidious with an irritating cough.

Complications: Complications from pertussis include pneumonia, seizures, encephalopathy, and death.

Duration: With or without treatment, the illness persists for three weeks to three months; the average duration is seven weeks.

C. Reservoir

Humans are the only known reservoir.

D. Modes of Transmission

Spread: Pertussis is most commonly spread by contact with respiratory droplets or by contact with airborne droplets of respiratory secretions. It occurs rarely by contact with an infected person's freshly contaminated articles.

E. Incubation Period

The incubation period is usually nine to 10 days, with a range of six to 20 days.

F. Period of Communicability or Infectious Period

Persons with pertussis are most infectious during the catarrhal period and the first two weeks after cough onset (i.e., approximately 21 days). For the purpose of surveillance and workup: The person is most efficient at spreading disease once the cough begins. To determine the period of communicability, take cough onset and go out 21 days or until person has completed the first five full days of an appropriate antibiotic.

G. Epidemiology

- Young infants (particularly preterm infants) are at highest risk for acquiring clinical pertussis and associated complications. Adolescents and adults are often the source of infection for infants.
- Pertussis occurs worldwide. It is endemic, with peaks occurring every two to five years.
- Pertussis exhibits no distinct seasonality in the U.S.; however, it may increase in the summer and fall.
- Long-term carriage (i.e., several months) of B. pertussis probably does not occur. However, it has been documented that persons can become infected and remain asymptomatic. Transmission from asymptomatic infected persons to others may occur but is less likely than for symptomatic persons since asymptomatic persons do not have a cough.
- Pertussis is highly infectious, with secondary attack rates of 80 to 90 percent among susceptible household contacts.
- Pertussis vaccine is 70 to 90 percent effective. Immunity wanes five to 10 years after the last dose of pertussis vaccine is given.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify sources and sites of transmission and any additional cases.
- To identify close contacts and recommend prophylaxis for those at risk for severe complications due to pertussis or those who may come in contact with those at risk for severe complications due to pertussis.
- To monitor the effectiveness of outbreak control strategies.
- To provide data for monitoring the effectiveness of new vaccine formulations.
- To analyze vaccination status by age to determine whether the problem is predominantly failure to vaccinate or vaccine failure.
- To characterize the epidemiology of pertussis disease in Iowa.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address: IDPH, CADE

Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Reporting forms are available at:
http://healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295.

C. Laboratory Testing:

- Who should be tested for pertussis?
  - Any person presenting with symptoms consistent with pertussis, regardless of contact with a case or an outbreak situation.
- Who should not be tested for pertussis?
  - Asymptomatic persons, regardless of contact with a case or an outbreak situation.
- Do symptomatic contacts of laboratory confirmed cases need to be tested?
  - It is not necessary to test the first "ring" out from a laboratory confirmed case if the contact was exposed while the lab confirmed case was infectious, proper incubation time has elapsed, and the signs and symptoms are compatible with pertussis.
  - It is recommended that the second "ring" out from a laboratory confirmed case be tested (e.g., contacts of a contact of a laboratory confirmed case).
- What test should be performed?
  - Polymerase chain reaction (PCR) testing is recommended and should be used for laboratory confirmation.
  - Serologic testing is not yet standardized and is not widely available. Due to lack of association between antibody levels and immunity to pertussis, results of serologic testing are difficult to interpret.
- Where can testing be performed?
  - PCR testing is available at the State Hygienic Laboratory. For more information on testing services provided by SHL, call 319-335-4500 or visit: www.shl.uiowa.edu/.
- Specimen Collection and Handling:
  - PCR is a very sensitive test and precautions should be taken to prevent cross-contamination of specimens (i.e., changing gloves and use of sterile scissors or decontamination of scissors using bleach solution) for each patient.
  - If possible, specimens should be collected prior to start of antibiotic treatment. However, PCR detects both live and dead bacteria, so it does not indicate active disease.
  - A properly obtained nasopharyngeal swab, wash, or aspirate is essential for optimal test results. Collection and handling instructions for each specimen type are described below.
  - Nasopharyngeal swab testing kits consisting of slides, media and swabs in mailing containers can be ordered from the State Hygienic Laboratory at (319) 335-4500.

Nasopharyngeal Swab:

1. Gently insert nasopharyngeal swab into a nostril until the posterior nasopharynx is reached. Use a dacron or calcium alginate swab, not cotton.
2. Leave the swab in place for 10 to 30 seconds.
3. Slowly remove with a rotating motion.
4. Place swab tip into 1.5 ml screw cap tube. Cut the excess length of the wire shaft with a sterile scissors, and cap the tube tightly. Treatment of scissors with 10 percent bleach prior to use is effective in removing contamination with bacterial DNA from other sources.
5. Repeat process to collect a second swab, and place in the glass vial containing the Regan-Lowe transport medium. Cut off excess length of shaft, and cap the tube tightly.
6. If the kit does not contain Regan-Lowe transport medium, then place second swab in the replicate 1.5 ml screw cap tube provided in the kit.
7. Label specimens, wrap in absorbent material, and place in a biohazard bag and seal. Use a single biohazard bag for each patient's specimens. Place the completed Test Request Form in the outside pocket of the biohazard bag.

Nasal Wash: Instill several milliliters of sterile saline into nostrils while patient's head is tilted back. Bring patient's head forward and catch saline flowing from the nostrils in a small container. Pour specimen (minimum volume 0.2 ml) into the 1.5 ml sterile tube contained in the kit.

Nasopharyngeal Aspirate: A small catheter with a suction trap or bulb aspirator is inserted through the nostrils into the nasopharynx. Apply suction while slowly removing the catheter or aspirator tip. The catheter or aspirator should be flushed with sterile saline or viral transport medium and contents (minimum volume 0.2 ml) placed into the 1.5 ml sterile tube contained in the kit.

- Test result interpretation:

Positive results indicate that the bacterium was detected in the specimen.

Negative results indicate that the bacterium was not detected in the specimen. Note: negative results may occur if the patient is tested greater than three weeks after symptom onset.

Equivocal results occur occasionally, meaning the PCR test does not clearly indicate a positive OR negative result. The clinician must then determine if the clinical symptoms and epidemiologic factors indicate a likely pertussis diagnosis or not. Public health follow up should depend on this determination.

Indeterminate results rarely occur. Indeterminate results are generally caused by an inadequate specimen or interfering substances in the specimen that inhibited the reaction. Retesting can be considered. Ultimately, the clinician must determine if the clinical symptoms and epidemiologic factors indicate a likely pertussis diagnosis or not. Public health follow up should depend on this determination.

D. Local Public Health Agency (LPHA) Follow-Up Responsibilities

Case Investigation

1. Pertussis follow-up and case investigation is undertaken by the local public health agency (LPHA) and coordinated, if necessary, with IDPH Center for Acute Disease Epidemiology (CADE).
2. LPHA is responsible for conducting pertussis follow-up. Case investigation includes but is not limited to the following steps.
   a. Confirm the case's diagnosis.
   b. Conduct the case interview, using the case interview form included this chapter and also in the Iowa Disease Surveillance System (IDSS).
   c. Identify all household contacts, close contacts at high risk of developing severe illness, and contacts who themselves have close contact with individuals at high risk.
   d. Determine whether any of the identified contacts are symptomatic.
      - Recommend prophylaxis for asymptomatic close contacts (See *Section 3. C. Post Exposure Antimicrobial Prophylaxis Recommendations* on page 7*)*.
      - Symptomatic contacts should receive antibiotic treatment, possibly test, and be isolated until they have completed the first five days of the full course of an appropriate antibiotic (symptomatic contacts who refuse antibiotics should stay home through 21 days after cough onset). Symptomatic contacts are considered "epi-linked cases" and should be investigated as new cases and reported accordingly into the Iowa Disease Surveillance System (IDSS).
      - If symptomatic contacts have already coughed for more than 21 days at the time of diagnosis, the individual is no longer contagious to others. In most cases neither treatment nor isolation are indicated *(See Section 3. B. Recommended Treatment Protocol* on page 6 and *Section 3. C. Post Exposure Antimicrobial Prophylaxis Recommendations* on page 7*.)*
   e. Use the Iowa Disease Surveillance System (IDSS) to complete the Pertussis Case Investigation form. If IDSS is not available, paper forms can be used. This will drive the investigation. If paper forms are used, fax to the Center for Acute Disease Epidemiology (CADE) at (515)281-5698.

Contact the assigned field epidemiologist with questions or if assistance is needed. (800-362-2736)

3) CONTROLLING FURTHER SPREAD AND PREVENTING DISEASE

A. Identifying close contacts and high risk populations

Close Contact: While each situation should be evaluated separately and exposure defined based on information acquired through the investigation, close contacts are generally defined as persons who:

- Shared confined space in close proximity with a symptomatic case patient for greater than one hour;
- Had direct face-to-face contact for a period (not defined) with a symptomatic case while they were infectious; or
- Had direct contact with respiratory, oral, or nasal secretions from a symptomatic case-patient (e.g., an explosive cough or sneeze in the face, sharing food, sharing eating utensils during a meal, kissing, mouth-to-mouth resuscitation, or performing a medical exam including examination of the nose and throat).

High Risk Populations: The following groups are generally considered to be at high risk of developing severe illness:

- Infants and women in their third trimester of pregnancy -- severe and sometimes fatal pertussis-related complications occur in infants aged <12 months, especially among infants aged <4 months. Women in their third trimester of pregnancy may be a source of pertussis to their newborn infant.
- All persons with pre-existing health conditions that may be exacerbated by a pertussis infection (for example, but not limited to immunocompromised persons and patients with moderate to severe medically treated asthma).

B. Recommended Treatment Protocol:

The symptoms of pertussis may be modified if treatment is begun early, during the catarrhal stage. If started later in the course of the illness, treatment will decrease the infectious period, but may not decrease the duration of cough or severity of disease.

If symptomatic people are already beyond their infectious period, which ends 21 days after cough onset, treatment is generally not beneficial. However, for certain high-risk settings or individuals (such as pregnant women in their third trimester or infants less than 12 months), healthcare providers may consider extending the period for initiating treatment up to six weeks after symptoms start.

A specific class of antibiotics called macrolides is most effective against pertussis. The table below summarizes recommended oral antibiotics and dosages by age group.

Summary of oral macrolide treatment by age group.
(Recommended Antimicrobial Agents for the Treatment and Postexposure Prophylaxis of Pertussis, 2005 CDC Guidelines, available at: www.cdc.gov/mmwr/preview/mmwrhtml/rr5414a1.htm?s_cid=rr5414a1_e)

Age group	Azithromycin	Clarithromycin	Erythromycin
<1 month	Recommended agent. 10 mg/kg per day in a single dose for 5 days (only limited safety data available)	Not recommended. (safety data unavailable)	Not recommended. Erythromycin is associated with infantile pyloric stenosis. Use if azithromycin is unavailable. 40-50 mg/kg per day in 4 divided doses for 14 days
1-5 months	10 mg/kg per day in a single dose for 5 days.	15 mg/kg per day in 2 divided doses for 7 days.	40-50 mg/kg per day in 4 divided doses for 14 days.
Infants (aged ≥6 months) and children	10 mg/kg in a single dose on day 1, then 5 mg/kg per day (maximum: 500 mg) on days 2-5.	15 mg/kg per day in 2 divided doses (maximum: 1 g per day) for 7 days.	40-50 mg/kg per day (maximum: 2 g per day) in 4 divided doses for 14 days.

Adults	500 mg in a single dose on day 1, then 250 mg per day on days 2-5.	1 g per day in 2 divided doses for 7 days.	2 g per day in 4 divided doses for 14 days.

Trimethoprim sulfamethoxazole (TMP-SMZ) may be used as an alternative agent in patients aged ≥2 years who are allergic to macrolides, who cannot tolerate macrolides, or who are infected, rarely, with a macrolide-resistant strain of *Bordetella pertussis*.

- The recommended dose in children is trimethoprim 8 mg/kg/day, sulfamethoxazole 40 mg/kg/day in two divided doses for 14 days.
- For adults, the recommended dose is trimethoprim 320 mg/day, sulfamethoxazole 1600 mg/day in two divided doses for 14 days.

NOTE: Because of the risk of kernicterus, TMP-SMZ should not be given to pregnant women, nursing mothers, premature neonates, or infants <two months of age.

NOTE: Only limited data from small clinical trials are available that confirm the microbiologic effectiveness of macrolides in infants < six months of age with pertussis, who are more likely to be partially or unimmunized and whose colonization is more likely to be prolonged compared with older, previously immunized individuals with pertussis.

- Nevertheless, considering theoretical rationale, in vitro effectiveness, safety and clinical data in older individuals with pertussis, and treatment adherence issues, the macrolides listed above may be used as a first line agent in infants 1 to 6 months of age.
- For infants <1 month of age, the risk of developing severe pertussis and life threatening complications outweighs the potential risk of infantile hypertrophic pyloric stenosis (IHPS) that is associated with macrolide use. All infants <1 month of age who receive any macrolide should be monitored for the development of IHPS and, as with other antibiotics with limited experience, for other serious adverse events.

C. Post Exposure Antimicrobial Prophylaxis Recommendations

The primary goal of post exposure antimicrobial prophylaxis is to prevent death and serious complications from pertussis in individuals at increased risk of severe disease. Appropriate administration of antimicrobial prophylaxis to asymptomatic contacts can prevent symptomatic infection.

Prophylaxis is generally indicated when:

A. The asymptomatic contact was exposed to the case during the case's infectious period (<21 days after onset of cough in the case), and
B. The asymptomatic contact's last exposure to the infectious case occurred <21 days (one incubation period) ago.

However, at their discretion, healthcare providers could consider prophylaxis of high-risk close contacts up to six weeks after exposure.

Prophylaxis is generally recommended for the following groups, regardless of their immunization status:

1. All household contacts (within families, secondary attack rates have been demonstrated to be high, even when household contacts are current with immunizations),
2. Close contacts at high risk of developing severe illness, or
3. Close contacts who themselves have close contact with either infants under 12 months, pregnant women in their third trimester, or individuals with pre-existing health conditions that may be exacerbated by a pertussis infection.

4. All contacts in high risk settings that include infants (<12 months) or pregnant women in their 3rd trimester (such as neonatal intensive care units, childcare settings, and maternity wards).

(See *Section A. Identifying close contacts and high risk populations* on page 5, for further clarification of "close contacts" and "high risk")

A broader use of PEP may be recommended in rare situations. Please contact your field epidemiologist or CADE for consultation or questions regarding these situations.

The recommended antibiotics and dosage by age group is identical for treatment and prophylaxis. Therefore, refer to the table in Section 3.B Recommended Treatment Protocol on page 6 for the schedule.

D. Isolation

Cases:

- If the patient has already coughed for more than 21 days at the time of diagnosis, the individual is no longer contagious to others and isolation is not indicated.
- Cases who have been coughing fewer than 21 days should stay home (this includes exclusion from social settings such as school, child care, work, church, and the mall) until they have completed the first five days of the full course of an appropriate antibiotic. During this time, they also should not have visitors.
- Cases who refuse antibiotics should stay home (this includes exclusion from social settings such as school, child care, work, church, and the mall) through 21 days after cough onset. During this time, they should not have visitors.

Asymptomatic contacts:

- Prophylactic antibiotics are offered (to household contacts, close contacts at high risk of developing severe illness, and to close contacts who themselves have close contact with persons at high risk) to prevent others from becoming ill with pertussis or spreading the disease to those at high risk for severe disease.
- Therefore, asymptomatic close contacts are not contagious and they do not need to be excluded from social settings. They should be monitored for the development of symptoms.

Symptomatic contacts (Epi-link case):

- Symptomatic contacts should be referred to a physician for treatment and testing if appropriate (*See section 2.C. Laboratory Testing on page 3*).
- If symptomatic contacts have already coughed for 21 days at the time of diagnosis, the individual is no longer contagious to others and isolation is not indicated.
- Symptomatic contacts, who have coughed fewer than 21 days, should be placed on antibiotics, isolated to home, and considered infectious until having completed the first five days of the full course of an appropriate antibiotic.
- Symptomatic contacts who refuse antibiotics should stay home (this includes exclusion from social settings such as school, child care, work, church, and the mall) through 21 days after cough onset. During this time, they should not have visitors.
- If the physician defers antibiotics until diagnostic test results are available, the symptomatic contact should be excluded from social settings until results become available. If results are negative, the individual may return immediately unless the clinician makes the diagnosis of pertussis on the basis of clinical and epidemiologic data.

E. Vaccination and Preventive Measures

The focus of vaccination is the prevention of the spread of pertussis in general; therefore all contacts that are not up to-date with DTaP/DTP/Tdap should be brought up-to-date.

For current recommendations for vaccination, visit the IDPH Bureau of Immunization and Tuberculosis web page at: www.idph.state.ia.us/ImmTB/Immunization.aspx?prog=Imm&pg=ImmHome.

The follow points provide additional detail and clarification related to pertussis immunizations:

- Active immunization started after exposure will not protect against disease resulting from that exposure, but it is not contraindicated. It will decrease the risk for disease from future exposure. The best protection is obtained by adhering to the recommended schedule.
- Assess the immunization status of close contacts. Children who are unimmunized or underimmunized should have immunization initiated, completing the series with minimum intervals.
- Children who have received their third dose of DTP/DTaP ≥six months before exposure should receive a fourth dose.
- Supplemental vaccination is not recommended for children who are up-to-date for age.
- While the use of an accelerated routine schedule of pertussis vaccination for infants (e.g., aged <two months at initial vaccination) during pertussis outbreaks is considered an acceptable outbreak control measure, it is usually not recommended because it would not match the schedule of other needed vaccinations. DTaP vaccines are not licensed for use in infants less than six weeks of age. The impact of implementing an accelerated schedule is likely to be modest, but could result in some decrease in pertussis morbidity among infants between 14 weeks and six months of age.
- Pertussis vaccine does not protect against infection by *B. parapertussis*.
- Many experts recommend children (especially infants aged <12 months) who have had a history of pertussis disease complete the routine vaccination series for pertussis with DTaP. This is because the duration of protection from pertussis disease is unknown and the diagnosis of pertussis can be difficult to confirm, especially if testing methods other than PCR are used. At least one study found that infants (age<12 months) may have a suboptimal immune response following pertussis disease.

While routine vaccination is the best preventive measure against pertussis, good personal hygiene (which consists of proper hand hygiene, disposal of used tissues, etc.) is also important.

F. Managing Special Situations: While the basic principles of case investigation, treatment of cases, and close contact prophylaxis also apply to these settings, additional considerations are included below.

Schools and Preschools: (*If preschool is part of larger childcare setting, see child care center section below.*)

Pertussis outbreaks have occurred even with high vaccine coverage levels (persons with three or more doses of pertussis containing vaccine). Often outbreaks are not limited to a single class or grade. Attack rates vary by grade and school activities. Transmission in school settings may include other children, the teacher in the classroom, or other social groups such as athletic teams or clubs.

Prophylaxis recommendations follow those outlined in Section 3. C. Post Exposure Antimicrobial Prophylaxis Recommendations on page 7. When identifying close contacts, it is important to determine if there are any patterns of interaction that would increase exposure time among a group (such as children living in the same neighborhood, riding the same bus, going to the same school, and participating in the same activities, etc.).

The following checklist should be used when investigating cases and outbreaks in school and preschool settings:

Work with the school nurse and appropriate teachers to take the following actions:

1. Identify close contacts among students and staff who interact directly with the case.
2. Evaluate close contacts (students and staff) for cough illness.
3. Refer close contacts to their healthcare provider for appropriate treatment, isolation, or prophylaxis (*see Section 3. B. Recommended Treatment Protocol on page 6, Section C. Post Exposure Antimicrobial Prophylaxis Recommendations page 7, and Section 3.D. Isolation on page 8*). A School/Childcare Close Contact Letter Template is included in this chapter for distribution among close contacts; these may be issued on the stationery of the local public health agency or the affected institution.

4. Consider sending a general notification home with all students, acknowledging that there has been a case of pertussis in the school and encouraging parents to ensure their children are "up to date" on vaccine (in particular the adolescent booster) and to be aware of signs and symptoms and what to do if they occur. A School-wide / Childcare-wide General Notification Pertussis Letter Template is included in this chapter; these may be issued on the stationery of the local public health agency or the affected institution.

5. Request that all teachers in the school refer coughing students to the nurse's office.

6. Maintain a pertussis surveillance log that includes a line listing for all symptomatic individuals with cough onset and duration, labs, antibiotic type and start and finish date, location (in schools, grade and home room), and other symptoms present. On a separate list, keep track of the close contacts**,** recording the names and locations of students and staff (classrooms, teams, etc.). See school contact letter included in this chapter.

NOTE: Close Contact letters that recommend consideration of prophylactic antibiotics given to minors should be accompanied by a phone or email to parents notifying them of the letter. This follow-up could be performed by secretarial staff, for example, and does not have to be done by a health professional. This additional phone or email communication is NOT necessary for the school-wide, general notification letter.

Childcare:

Usually children in child care centers have extensive contact with each other and it can be difficult to distinguish individuals with or without significant exposure.

Exposures occurring in child care settings without children less than 12 months of age (no infants in the childcare center) should be managed in accordance with Section 3.C. Post Exposure Antimicrobial Prophylaxis Recommendations on page 7.

For cases occurring in child care settings with children less than 12 months of age (there are infants in the childcare center), the recommendations are based upon whether children are divided into multiple classrooms.

- If there are multiple classrooms that do not intermingle, and:

  - The exposure occurs in a room with children less than 12 months of age, it is recommended that the case's entire class and assigned staff be considered close contacts and they should all be advised to receive prophylaxis (because they are or have contact close contact with a child less than 12 months).
  - The exposure occurs in a room with children greater than 12 months of age, all children should be considered exposed and prophylaxis should be managed in accordance with Section 3.C. Post Exposure Antimicrobial Prophylaxis Recommendations on page 7.
    - In this situation, it would be appropriate to distribute the School/Childcare Close Contact Letter Template to all children and staff assigned to the same classroom as the case.
  - In both cases, the School-wide / Childcare-wide General Notification Pertussis Letter Template should be distributed to all children and staff in the facility (all classrooms).

- If the child care center is not divided into separate classes, it is recommended that the entire center and all staff be considered close contacts and receive prophylaxis (because they have contact close contact with a child less than 12 months).
  - In this situation, the School/Childcare Close Contact Letter Template would be appropriate to distribute to all children/families and staff.

In home-based child care settings with at least one child less than 12 months of age, it is recommended that all children and all child care providers (including any members of the child care providers' families who had any contact with the case during their infectious period) receive prophylaxis.

- In this situation, the School/Childcare Close Contact Letter Template would be appropriate to distribute to all children/families and staff.

Offices and other facilities:
The basic principles of case and contact investigation, treatment of cases, and prophylaxis of close contacts apply (*see Section 3. B. Recommended Treatment Protocol on page 6, Section C. Post Exposure Antimicrobial Prophylaxis Recommendations page 7, and Section 3.D. Isolation on page 8*). A General Close Contact Letter Template for distribution among close contacts is included in this chapter; these may be issued on the stationery of the local public health agency or the affected facility.

Depending upon the situation and facility a general notification letter may also be appropriate. A General Pertussis Notification Letter Template is also included in this chapter; these may be issued on the stationery of the local public health agency or the affected facility.

NOTE: Close Contact letters, which recommend prophylactic antibiotics according to the high risk criteria, that are given to minors should be accompanied by a phone or email to parents notifying them of the letter. This follow-up could be performed by secretarial staff, for example, and does not have to be done by a health professional. This additional phone or email communication is NOT necessary for the general notification letter.

Healthcare Facilities:
In healthcare settings, surveillance should be initiated immediately after identification of a suspect case and continue through two incubation periods (42 days) after the date of cough onset in the last case. Healthcare provider's pertussis vaccination should be up-to

date. A single dose of Tdap is recommended for all health care personnel who have not previously received Tdap as an adult.

Regardless of their vaccination status, healthcare providers should use appropriate masks in the presence of a patient with cough illness to prevent exposures from occurring.

- Healthcare workers exposed to a case who have appropriately followed Standard Precautions and Droplet Precautions (including wearing a mask) during close contact with the case, do not require prophylaxis.
- Recommendations for healthcare workers exposed to a case, who have not appropriately followed Standard Precautions and Droplet Precautions (did not wear a mask) during close contact with the case, are based upon the setting and patient populations they serve:
    - Asymptomatic healthcare workers, who work with patients at risk for severe pertussis (*see Section 3. A. Identifying close contacts and high risk populations on page 5*) should receive prophylaxis *(see Section 3. C. Post Exposure Antimicrobial Prophylaxis Recommendations on page 7*). Examples of these high risk settings would include neonatal intensive care units, cancer treatment units, and maternity wards.
    - Other asymptomatic healthcare workers, who do not work with high risk patients, can be monitored for 21 days after exposure and prophylaxis is not required. If the healthcare worker becomes symptomatic, they should be excluded immediately.
- When cases occur within healthcare facilities (i.e., a patient is hospitalized with pertussis):
    - Apply Droplet and Standard Precautions to all staff, patients, and families in close contact with the case.
      In healthcare settings, "close contact" is defined as the following:
        1. having face-to-face contact, within three feet of the case; this includes conducting a medical examination, obtaining a nasopharyngeal swab, suctioning, intubating, performing bronchoscopy or similar procedure without appropriate PPE;
        2. conducting any procedure that induces coughing of the case, even if farther from the case than three feet without appropriate PPE;
        3. coming into mucosal contact with respiratory, oral, or nasal secretions of the case directly; and
        4. sharing a room with the case.
    - The basic principles of case and contact investigation, treatment of cases, and prophylaxis of close contacts apply (*see Section 3. B. Recommended Treatment Protocol on page 6, Section C. Post Exposure Antimicrobial Prophylaxis Recommendations page 7, and Section 3.D. Isolation on page 8*).
    - Providers, department heads, infection prevention, employee health, and other relevant personnel/departments should be notified of the case.

Other:

Institutional Setting:

In institutional settings (e.g. correctional facilities), prophylaxis recommendations may vary depending upon this situation. Please contact your field epidemiologist or CADE for consultation or questions regarding these situations.

Repeat Exposures:

When continued transmission of pertussis is evident, multiple rounds of antibiotics are not recommended unless:

1) the close contact is determined to be at high risk, or
2) the close contact has close contact with persons at high risk.
(*Section 3. A. Identifying close contacts and high risk populations* on page 5)

Rather than repeating a course of antibiotics, close contacts determined not to be at high risk and not to have close contact with persons at high risk, should be monitored for onset of signs and symptoms of pertussis for 21 days.

ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Pertussis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top.

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *Red Book 2009: Report of the Committee on Infectious Diseases, 28h Edition*. Illinois, American Academy of Pediatrics, 2009.
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CDC. Pertussis: Summary of Vaccine Recommendations. January, 2011 www.cdc.gov/vaccines/vpd-vac/pertussis/recs-summary.htm
Heymann, David L., ed., *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.
Honein, M.A., Paulozzi, L.J., Himelright, I.M., *et al*. Infantile hypertrophic pyloric stenosis after pertussis prophylaxis with erythromycin: a case review and cohort study. *Lancet* 1999; 354:2101–2105.
CDC: Epidemiology and Prevention of Vaccine-Preventable Diseases “Pink Book”. Ninth edition, January 2006.

Additional Resources

CDC website providing Guidelines for the Control of Pertussis Outbreaks: www.cdc.gov/vaccines/pubs/pertussis-guide/guide.htm.

CDC Advisory Committee on Immunization Practices Link to recommendations including pertussis: www.cdc.gov/vaccines/pubs/ACIP-list.htm.

FACT SHEET

PERTUSSIS
(Whooping Cough)

What is pertussis (whooping cough)?
Pertussis is a disease caused by bacteria. It causes severe spells of coughing. These spells can interfere with eating, drinking and breathing. Pertussis can lead to pneumonia, convulsions, inflammation of the brain (encephalitis) and sometimes death.

Who can get pertussis?
Pertussis can occur at any age. It is most common in infants less than one year old, but anyone can get it. Pertussis can be hard to diagnose in teens and adults because their symptoms often look like a cold with a nagging cough.

How is pertussis spread?
Pertussis is spread through the air after an infected person coughs or sneezes. Other people breathe in infected droplets.

What are the symptoms of pertussis?
Pertussis starts like a cold with symptoms of runny nose and an irritating cough. Within one to two weeks the cough develops into coughing fits. The fits are a series of violent coughs during which the victim struggles for breath. A gasping for air, which produces a high-pitched whooping sound, follows the coughing. The coughing fits occur more frequently at night, and are often followed by vomiting. Between spells, the person usually appears to be well. Adults, teens, and vaccinated children may have milder symptoms.

How long is an infected person able to spread pertussis?
Without treatment an infected person can spread the disease from the time he or she starts coughing until 21 days after the start of the cough. After five days of treatment with an appropriate antibiotic, an infected person cannot spread the disease.

Can a person get pertussis again?
Yes.

How is pertussis diagnosed?
A doctor may think a patient has pertussis because of the symptoms, but a sample of mucus must be taken from the back of the nose for testing. This sample is then sent for testing to determine whether the patient has pertussis.

What is the treatment for pertussis?
Treatment with an appropriate antibiotic may help if given early in the illness. Other treatments such as fluids, oxygen, and mild sedation may help the child during the prolonged period of severe coughing.

Should people who have been around a person with pertussis be treated?
People with symptoms should see their healthcare provider.

Even without symptoms, all household contacts and other close contacts determined to be at high risk for severe pertussis or in contact with someone at high risk and who don't have symptoms should receive postexposure prophylaxis (PEP), regardless of age or vaccine status.

Vaccination status should be assessed.

How can pertussis be prevented?
Pertussis may be prevented through routine immunization. Pertussis is spread through the air after an infected person coughs or sneezes. Other people breathe in infected droplets. Cover your mouth when you cough, stay away from others when they are coughing, wash your hands frequently. Ask your health care clinician/local public health department about vaccine for adolescents/adults.

Where is pertussis vaccine available?
All county health departments in Iowa give this vaccine. You may also check with your private health care provider.

Where can you get more information?

- Your doctor or nurse, your local health department (listed in the telephone book under local government).
- Iowa Department of Public Health, Bureau of Disease Prevention and Immunization, (800) 831-6293.

FACT SHEET
Information for health professionals

PERTUSSIS
(Whooping Cough)

What is pertussis (whooping cough)?
Pertussis is caused by the *Bordetella pertussis*, and can cause severe spells of coughing that lasts weeks to months. These spells can interfere with eating, drinking, sleeping and breathing. Pertussis can lead to pneumonia, convulsions, encephalitis and sometimes death (especially in young children). In adolescents and adults the most common symptom is a prolonged cough lasting over 2 weeks.

Who can get pertussis?
Pertussis can occur at any age. It is most commonly diagnosed in infants less than one year old, but anyone can get it.

How is pertussis spread?
Pertussis is spread through the air after an infected person coughs or sneezes.

What are the symptoms of pertussis?
Pertussis often begins with cold-like symptoms (runny nose and irritating cough). Within one to two weeks the cough develops into coughing spells, where the patient has violent coughs, and struggles for breath. A gasping for air, which produces a high-pitched whooping sound, (mainly in infants), follows the coughing, and gives the disease its name. This whoop is almost never heard in older children or adults. In all ages, these coughing spells frequently occur at night, and can be followed by vomiting and cyanosis. Between spells, the person usually appears to be well. Adults, teens, and those vaccinated typically have milder symptoms.

How long is an infected person able to spread pertussis?
Without effective antibiotic treatment an infected person can spread the disease from the time he or she starts coughing through 21 days after the start of the cough. After five days of treatment with an appropriate antibiotic, the patient is no longer considered infectious.

Can a person get pertussis again?
Yes. Disease does not confer lifetime immunity. Up-to-date vaccinations significantly reduce the risk of disease.

How is pertussis diagnosed?
A properly obtained nasopharyngeal swab or aspirate is essential for optimal test results. Nasopharyngeal swab testing kits (consisting of slides, media and swabs in mailing containers) can be ordered from the State Hygienic Laboratory (SHL) at (319) 335-4500 or www.shl.uiowa.edu/kitsquotesforms/. The best test for pertussis is the Polymerase chain reaction (PCR) test, which is available at SHL.

What is the treatment for pertussis?
Early treatment with an appropriate antibiotic will reduce the severity and length of illness. Unfortunately, antibiotics given more than 21 days after the cough began will not change the course of illness and is not recommended. However, for certain high-risk

settings or individuals, healthcare providers may consider extending the period for initiating treatment up to 6 weeks after symptoms start.

How should those around a pertussis patient be treated?
Symptomatic contacts need evaluation and treatment as warranted.

All household contacts and other close contacts determined to be at high risk for severe pertussis or in contact with someone at high risk and who are asymptomatic, should receive post exposure prophylaxis (PEP), regardless of age or vaccine status.

When continued transmission of pertussis is evident, multiple rounds of antibiotics are not recommended unless:

1) the close contact is determined to be at high risk, or
2) the close contact has close contact with persons at high risk.

Rather than repeating a course of antibiotics, close contacts determined not to be at high risk and not to have close contact with persons at high risk, should be monitored for onset of signs and symptoms of pertussis for 21 days.

If repeat prophylaxis is appropriate, the additional points should be considered:

- If the repeat exposure occurred less than 5 days after completion of the initial course of azithromycin (5 day course), no additional prophylaxis is needed.
- If the repeat exposure occurred more than 5 days after completion of the initial course of azithromycin or if a different prophylactic antibiotic (Clarithromycin, Erythromycin, or TMP-SMZ) was prescribed for the first exposure, another course of antibiotics should be prescribed.

Vaccination status should be assessed and brought up to date.

How can pertussis be prevented?
Pertussis may be prevented through routine immunization.

Instruct everyone to cover their mouth and nose when coughing and sneezing and to wash hands frequently. Everyone, including healthcare providers should be up-to-date on pertussis vaccine (the new tetanus booster contains pertussis vaccine).

When examining a person with a cough illness, a surgical mask should be worn for protection. Wearing of a mask at the appropriate times will reduce the need for post-exposure antibiotics. Remember, prophylactic antibiotics are recommended regardless of vaccine status.

Where can you get more information or call for consultation?
Iowa Department of Public Health, Center for Acute Disease Epidemiology, (800)362-2736 or visit:
www.idph.state.ia.us/CADE/DiseaseIndex.aspx?disease=Pertussis

Pertussis

Agency: ______ Investigator: ______ Phone number: ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______ Date of Birth: / / Estimated? ☐ Age:
First and middle name: ______
Gender: ☐ Female ☐ Male ☐ Other ____
Maiden name: ______ Suffix: ______
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Address line: ______
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Zip: ______ City: ______
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
State: ______ County: ______
Phone: ( )- - Type: ______
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Parent/Guardian name: ______
Facility name: ______
Parent/Guardian phone: ( )- - Type: ______

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom: ______
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ______ Country: ______

Healthcare provider information

Last name: ______
First name: ______
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - Type: ______

LABORATORY FINDINGS

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______
Test type: ☐ Culture ☐ PCR
Result type: ☐ Preliminary ☐ Final Result date: / /
Result: ☐ Negative ☐ No growth ☐ Positive ☐ Indeterminate ☐ Equivocal
Organism:

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______
Test type: ☐ Culture ☐ PCR
Result type: ☐ Preliminary ☐ Final Result date: / /
Result: ☐ Negative ☐ No growth ☐ Positive ☐ Indeterminate ☐ Equivocal
Organism:

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______
Test type: ☐ Culture ☐ PCR
Result type: ☐ Preliminary ☐ Final Result date: / /
Result: ☐ Negative ☐ No growth ☐ Positive ☐ Indeterminate ☐ Equivocal
Organism:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Note: The cough duration, cough type, and symptoms must be documented for IDPH to status case.

Symptoms

Cough: ☐ Yes ☐ No ☐ Unk

Cough type: ☐ Paroxysmal ☐ Whoop ☐ Other

Onset Date: / /

Symptoms: ☐ Apnea event ☐ Pneumonia ☐ Post-tussive vomiting ☐ Seizures ☐ None listed above

Chest X-ray done: ☐ Yes ☐ No ☐ Unk

X-ray date / /

X-ray result: _____

Encephalopathy ☐ Yes ☐ No ☐ Unk

Pneumonia: ☐ Yes ☐ No ☐ Unk

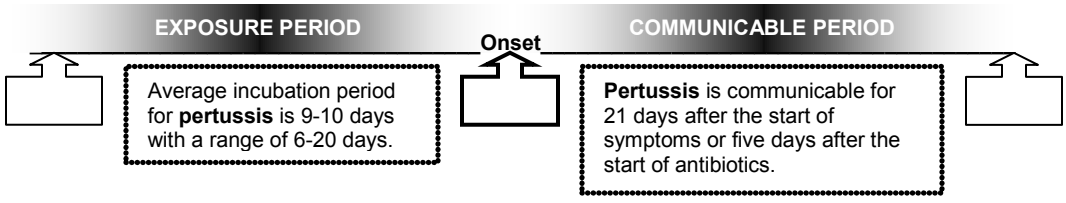
Final interview date: / /

Cough at final interview: ☐ Yes ☐ No ☐ Unk

Duration in days: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:		Antibiotic:		Antibiotic:	
Date started:	/ /	Date started:	/ /	Date started:	/ /
Dose:		Dose:		Dose:	
Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU
# of days:		# of days:		# of days:	
# of times a day:		# of times a day:		# of times a day:	
Route:		Route:		Route:	

RISK FACTORS/TRAVEL

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:	Departure date: / /	Return date: / /
Traveled within U.S.? ☐ Yes ☐ No ☐ Unk	State: City:	Departure date: / /	Return date: / /
Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:	Departure date: / /	Return date: / /

Setting Acquired

Child care ☐ Yes ☐ No ☐ Unk	Home ☐ Yes ☐ No ☐ Unk	Military ☐ Yes ☐ No ☐ Unk
Church ☐ Yes ☐ No ☐ Unk	Hospital ward ☐ Yes ☐ No ☐ Unk	School ☐ Yes ☐ No ☐ Unk
College ☐ Yes ☐ No ☐ Unk	Hospital outpatient ☐ Yes ☐ No ☐ Unk	Work ☐ Yes ☐ No ☐ Unk
Correctional Facility ☐ Yes ☐ No ☐ Unk	Hospital ER ☐ Yes ☐ No ☐ Unk	Other _____
Doctors office ☐ Yes ☐ No ☐ Unk	International travel ☐ Yes ☐ No ☐ Unk	

Secondary spread

Child care ☐ Yes ☐ No ☐ Unk	Home ☐ Yes ☐ No ☐ Unk	Military ☐ Yes ☐ No ☐ Unk
Church ☐ Yes ☐ No ☐ Unk	Hospital ward ☐ Yes ☐ No ☐ Unk	School ☐ Yes ☐ No ☐ Unk
College ☐ Yes ☐ No ☐ Unk	Hospital outpatient ☐ Yes ☐ No ☐ Unk	Work ☐ Yes ☐ No ☐ Unk
Correctional Facility ☐ Yes ☐ No ☐ Unk	Hospital ER ☐ Yes ☐ No ☐ Unk	Other _____
Doctors office ☐ Yes ☐ No ☐ Unk	International travel ☐ Yes ☐ No ☐ Unk	

Worked with a case: ☐ Yes ☐ No ☐ Unk From date: / / To date: / /

Lived with another case: ☐ Yes ☐ No ☐ Unk From date: / / To date: / /

Vaccinated for pertussis? ☐ Yes ☐ No ☐ Unk

Vaccination

Date vaccinated: / /	Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:
Date vaccinated: / /	Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

# of vaccinations: _____

Reason not vaccinated (check only one):

☐ Religious exemption
☐ Medical contraindication
☐ Previous disease confirmed by culture or MD
☐ Parent refusal
☐ Age less than 7 months
☐ Other _____
☐ Unknown

CONTACTS

Number of people who may have been exposed by the case: _____

Number of people prophylaxed: _____

List Contacts with symptoms. Initiate an IDSS case and start an investigation for each symptomatic contact listed.

Name	Address (if different from case)	Phone number

NOTES:

(General Close Contact Letter Template- Pertussis)

Dear:

You/your child have/has been exposed to pertussis (whooping cough). Pertussis is an infection that affects the airways and is easily spread from person to person by coughing or sneezing. It causes a severe cough that can last for weeks or months, sometimes leading to coughing fits and/or vomiting. Anyone can get pertussis, but it can be very dangerous for infants and people with weakened immune systems or lung problems.

Recommendations:

1. If you/your child have/has a cough:
   Make an appointment with your/your child's healthcare provider as soon as possible and tell the healthcare provider that you/your child have/has been exposed to pertussis.
   - Keep your child /stay home from work and activities until your/your child's healthcare provider determines that you/your child do/does not have pertussis.
   - If your/your child's healthcare provider determines that you/your child does have/has pertussis, it is important that you/your child continue/s to stay home from work/school/childcare and other activities until you/your child have/has been on an antibiotic for five days. If you/your child has already been coughing for more than 21 days you/your child is no longer contagious so will not need antibiotics and will not need to stay home. However, you/your child may have spread pertussis to others during those 21 days.
   - If your/your child's healthcare provider confirms (via testing or examination) that you/your child do/does NOT have pertussis, you/your child can return to work/school/childcare and other activities at any time.
2. If you/your child do/does NOT have a cough:
   - If you/your child are/is
     - pregnant in your/their third trimester, or
     - is less that 12 months of age, or
     - have/has a weakened immune system or lung problems (like severe asthma or cystic fibrosis)

     you / your child needs to be started on antibiotics to prevent them from becoming ill. Ask your /your child's healthcare provider to prescribe antibiotics to you/your child as soon as possible to prevent pertussis.
   - And if you/your child live/s with or has a lot of contact with any of the following high risk people, ask your healthcare provider to prescribe antibiotics for you/your child as soon as possible so that you / your child does not give pertussis to them:
     - A woman who is pregnant in her third trimester,
     - An infant younger than 12 months old, or
     - Anyone with a weakened immune system or lung problems (like severe asthma or cystic fibrosis).
   - If you/your child do/does not meet the criteria listed above (you/your child is/are not, do not have, and do/does not have contact with pregnant women, infants less than 12 months of age, and weakened immune system/lung problems), you/your child do not need to receive antibiotics because of your / your child's pertussis exposure.
   - However, please watch for signs of pertussis (such as a cough) for 21 days and call your/your child's healthcare provider if you/they start coughing. At that time tell your/your child's health care provider that you/your child were exposed to pertussis.

Please make sure your family's vaccinations for pertussis are up-to-date. If you need the Tdap vaccine, contact your healthcare provider or call [insert contact] to find a vaccine provider near you.

When you go to a healthcare provider for pertussis, please show this letter to him or her. If you have any questions or concerns, please call us at [insert contact].

Sincerely,

Dear Colleague:
Your patient may have been exposed to pertussis.

If your patient does not have symptoms of pertussis:

National guidelines state: As a precaution to protect vulnerable individuals, if your patient meets **one or more** of the following criteria, we recommend antibiotic prophylaxis:

- Your patient is or has ongoing close contact with a woman who is pregnant in her third trimester.
- Your patient is or has ongoing close contact with an infant less than 12 months old.
- Your patient is or has ongoing close contact with a person with pre-existing health conditions that may be exacerbated by a pertussis infection (such as immunocompromised persons and patients with moderate to severe medically treated asthma).

If your patient does not meet any of the criteria listed above, antibiotic prophylaxis is not recommended. However, please educate your patient on how to watch for signs and symptoms.

If your patient does have symptoms of pertussis:

[insert public health agency], the Iowa Department of Public Health, and national guidelines recommend the following actions when assessing and treating patients exposed to pertussis :

If your patient has been coughing for less than 21 days:

1. Collect nasopharyngeal swabs, nasal aspirate, or nasal wash for pertussis PCR testing and send the specimens to the State Hygienic Laboratory for testing.
2. Do not delay treatment with appropriate antibiotics while waiting for laboratory results if there is no alternative diagnosis.
3. Document and communicate all clinical decisions related to pertussis to [insert public health agency or school name and contact information] (this includes children for whom pertussis has been ruled out) so that appropriate public health action can continue to be taken.
4. Strongly consider antibiotic prophylaxis for all household members, this is especially important if a pregnant woman, an infant less than 12 months old, or anyone with a pre-existing health conditions that may be exacerbated by a pertussis infection lives in the household.

If you patient has been coughing for 21 days or more:

1. Testing for pertussis is not recommended as the infection has resolved even though the symptoms may continue for weeks due to damage done by the infection. Testing after 3 weeks of cough is of limited benefit since PCR and culture are only sensitive during the first 2-3 weeks of cough when bacterial DNA is still present in the nasopharynx.
2. Treatment is generally no longer necessary after 21 days. However, because they are at higher risk of severe disease, infants or pregnant women in their third trimester could be treated up through 6 weeks after cough onset.
3. The patient is no longer infectious and can return to work/school/childcare/ and other activities.

For all households: Please make sure that all pertussis vaccinations are up to date for all household members or refer for vaccination [insert contact].

Additional clinical and laboratory guidance may be found on the IDPH website:
www.idph.state.ia.us/CADE/DiseaseIndex.aspx?disease=Pertussis.

Should you have any questions or concerns, please call [insert contact].

Sincerely,

(General Pertussis Notification Letter Template)

Dear:

This note is to let you know that at least one person at your (work, church) has been identified as having pertussis and is being treated with antibiotics. Pertussis is an infection that affects the airways and is easily spread from person to person by coughing or sneezing. It causes a severe cough that can last for weeks or months, sometimes leading to coughing fits and/or vomiting. Anyone can get pertussis, but it can be very dangerous for infants and people with weakened immune systems or lung problems.

Letters have already been sent to those people that the public health investigation identified as being at highest risk of becoming ill. If you have not received a previous letter you are not at high risk of getting pertussis.

However, since pertussis has been confirmed at your (work, church) public health recommends that you make sure your family's vaccinations are up-to-date. Basic protection against pertussis is provided by childhood pertussis vaccine, but this protection can decrease over time. Therefore, children (11 years of age and over) and all adults should get a booster shot for pertussis (Tdap) to boost their immunity. If you or a family member needs any pertussis vaccines, contact your healthcare provider or call [insert contact].

For more information on pertussis, please visit: (insert Webpage) or contact your local public health department.

Sincerely,

(School-Childcare Close Contact Letter)

Dear Parent or Guardian:

Your child has been exposed to pertussis (whooping cough). Pertussis is an infection that affects the airways and is easily spread from person to person by coughing or sneezing. It causes a severe cough that can last for weeks or months, sometimes leading to coughing fits and/or vomiting. Anyone can get pertussis, but it can be very dangerous for infants and people with weakened immune systems or lung problems.

Recommendations:

1. If your child has a cough:

   Make an appointment with your child's healthcare provider as soon as possible and tell the healthcare provider that your child has been exposed to pertussis.

   - Keep your child home from school and other activities outside of your home (such as afterschool activities, trips to the grocery store, or playing at another child's house) until your child's healthcare provider determines that your child does not have pertussis.
   - If your child's healthcare provider determines that child does have pertussis, it is important that your child continues to stay home from school and other activities until your child has been on an antibiotic for five days. If your child has already been coughing for more than 21 days your child is no longer contagious so will not need antibiotics and will not need to stay home. However, your child may have spread pertussis to others during those 21 days.
   - If your child's healthcare provider confirms (via testing or examination) that your child do NOT have pertussis, your child can return to school and other activities at any time.

2. If your child does NOT have a cough:

   - And your child is
     i. pregnant in her third trimester, or
     ii. is less that 12 months of age, or
     iii. has a weakened immune system or lung problems (such as severe asthma or cystic fibrosis),

     your child needs to be started on antibiotics to prevent them from becoming ill. Ask your child's healthcare provider to prescribe antibiotics as soon as possible to prevent pertussis.
   - And if your child lives with or has a lot of contact with any of the following high risk people, ask your healthcare provider to prescribe antibiotics for your child as soon as possible so that your child does not give pertussis to them:
     i. A woman who is pregnant in her third trimester,
     ii. An infant younger than 12 months old, or
     iii. Anyone with a weakened immune system or lung problems (like severe asthma or cystic fibrosis).
   - If your child does not have a cough nor meets either of the criteria listed above (your child is not, does not have, or does not have contact with pregnant women in their third trimester, infants less than 12 months of age, and persons with weakened immune systems or lung problems), your child does not need to receive antibiotics because of their pertussis exposure.
   - However, please watch for signs of pertussis such as a cough for 21 days and call your child's healthcare provider if they start coughing. At that time tell your help care provider that your child was exposed to pertussis.

Please make sure your family's vaccinations for pertussis are up-to-date. Contact your healthcare provider or call [insert contact] to find a vaccine provider near you.

When you go to a healthcare provider for pertussis, please show this letter to him or her. If you have any questions or concerns, please call us at [insert contact].

BACK OF LETTER

Dear Colleague:

Your patient may have been exposed to pertussis.

If your patient does not have symptoms of pertussis:

National guidelines state: As a precaution to protect vulnerable individuals, if your patient meets **one or more** of the following criteria, we recommend antibiotic prophylaxis:

2. Your patient is or has ongoing close contact with a woman who is pregnant in her third trimester.
3. Your patient is or has ongoing close contact with an infant less than 12 months old.
4. Your patient is or has ongoing close contact with a person with pre-existing health conditions that may be exacerbated by a pertussis infection (such as immunocompromised persons and patients with moderate to severe medically treated asthma).

If your patient does not meet any of the criteria listed above, antibiotic prophylaxis is not recommended. However, please educate your patient on how to watch for signs and symptoms.

If your patient does have symptoms of pertussis:

[insert public health agency], the Iowa Department of Public Health, and national guidelines recommend the following actions when assessing and treating patients exposed to pertussis :

If your patient has been coughing for less than 21 days:

1. Collect nasopharyngeal swabs, nasal aspirate, or nasal wash for pertussis PCR testing and send the specimens to the State Hygienic Laboratory for testing.
2. Do not delay treatment with appropriate antibiotics while waiting for laboratory results if there is if no alternative diagnosis.
3. Document and communicate all clinical decisions related to pertussis to [insert public health agency or school name and contact information] (this includes children for whom pertussis has been ruled out) so that appropriate public health action can continue to be taken.
4. Strongly consider antibiotic prophylaxis for all household members, this is especially important if a pregnant woman, an infant less than 12 months old, or anyone with a pre-existing health conditions that may be exacerbated by a pertussis infection lives in the household.

If you patient has been coughing for 21 days or more:

1. Testing for pertussis is not recommended as the infection has resolved even though the symptoms may continue for weeks due to damage done by the infection. Testing after 3 weeks of cough is of limited benefit since PCR and culture are only sensitive during the first 2-3 weeks of cough when bacterial DNA is still present in the nasopharynx.
2. Treatment is generally no longer necessary after 21 days. However, because they are at higher risk of severe disease, infants or pregnant women in their third trimester could be treated up through 6 weeks after cough onset.
3. The patient is no longer infectious and can return to work/school/childcare/ and other activities.

For all households: Please make sure that all pertussis vaccinations are up to date for all household members or refer for vaccination [insert contact].

Additional clinical and laboratory guidance may be found on the IDPH website: www.idph.state.ia.us/CADE/DiseaseIndex.aspx?disease=Pertussis.

Should you have any questions or concerns, please call [insert contact].

Sincerely,

(School-wide / Childcare-wide General Notification Pertussis Letter Template)

Dear Parent or Guardian:

This note is to let you know that at least one person at (insert name of school / childcare center) has been identified as having pertussis and is being treated with antibiotics. Pertussis is an infection that affects the airways and is easily spread from person to person by coughing or sneezing. It causes a severe cough that can last for weeks or months, sometimes leading to coughing fits and/or vomiting. Anyone can get pertussis, but it can be very dangerous for infants and people with weakened immune systems or lung problems.

Letters have already been sent to the parents of children who the public health investigation identified as being at highest risk of becoming ill. If you have not received a previous letter your child is not at high risk of getting pertussis.

However, since pertussis has been confirmed at your child's school/childcare center public health recommends that you make sure your family's vaccinations are up-to-date. Basic protection against pertussis is provided by childhood pertussis vaccine, but this protection can decrease over time. Therefore, children (11 years of age and over) and all adults should get a booster shot for pertussis (Tdap) to boost their immunity. If you or a family member needs any pertussis vaccines, contact your healthcare provider or call [insert contact].

For more information on pertussis, please visit: (insert Webpage) or contact your local public health department.

Sincerely,

Iowa Department of Public Health

Pertussis Outbreak Worksheet

Case Name: _____ **IDSS #:** _____ **Address:** _____ **Phone:** _____ **School/Etc** _____

Ref #	Name	Age	Phone	County of Residence	Case/epi-link/close contact	Cough onset date	Signs and Symptoms	NP swab date	Antibiotics (type/date started)	Setting	Relationship	Other Concerns
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												

Iowa Department of Public Health

Pertussis Outbreak Worksheet

Ref #	Name	Age	Phone	County of Residence	Case/epi-link/close contact	Cough onset date	Signs and Symptoms	NP swab date	Antibiotics (type/date started)	Setting	Relationship	Other Concerns
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

Iowa Department of Public Health

Pertussis Outbreak Worksheet

Ref #	Name	Age	Phone	County of Residence	Case/epi-link/close contact	Cough onset date	Signs and Symptoms	NP swab date	Antibiotics (type/date started)	Setting	Relationship	Other Concerns
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												

PLAGUE

Report Immediately by Phone

Potential Bioterrorism Agent Category A

Also known as Pestis, Bubonic Plague, Black Plague, Black Death

Responsibilities:
Hospital/Infection Preventionist: Report by phone immediately
Lab: Report by phone immediately
Physician: Report by phone immediately
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 282-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Plague is caused by the bacterium *Yersinia pestis*. It is a zoonotic disease of rodents and their fleas, which can be spread to humans.

B. Clinical Description

The initial signs and symptoms of plague in humans are usually non-specific, and include fever, chills, malaise, sore muscles (myalgia), nausea, sore throat, headaches, and weakness. Bubonic plague, the most common form, is a syndrome that includes painful swelling of lymph nodes. Pneumonic plague refers to a form affecting the lungs; septicemic plague is a form caused by disseminated infection of the blood stream. Meningeal plague, or plague affecting the membranes lining the brain and spinal cord, is rare. Both pneumonic and septicemic plague can be primary or secondary to another form of plague. Untreated bubonic plague is fatal in 50% – 60% of cases, while untreated primary septicemic and pneumonic plague are fatal in 100% of cases.

C. Reservoirs

Certain wild rodents and their fleas carry *Y. pestis*. In the United States, ground squirrels and prairie dogs in the western U.S. are the primary reservoirs of *Y. pestis*. Lagomorphs (rabbits and hares), wild carnivores (meat-eating mammals) and domestic cats may also be a source of infection to people. There is probably no wild reservoir in Iowa.

D. Modes of Transmission

Plague is acquired primarily through the bite of an infected flea or through inhalation of airborne *Yersinia pestis*, either through proximity to a human or animal case of pneumonic plague or by accidental exposure in a laboratory. Plague can also be acquired by handling tissues of infected animals or by being bitten or scratched by an infected animal.

E. Incubation Period

From 1 - 7 days.

F. Period of Communicability or Infectious Period

Patients with pneumonic plague are considered infectious throughout their symptomatic illness and for 72 hours following initiation of antibiotic treatment. Discharge from lesions in patients with bubonic plague is considered infectious.

G. Epidemiology

Wild rodent plague exists in large areas of South America, Africa, Eastern Europe and Asia. In 2007, 7 countries reported 2021 cases with 156 deaths. Among these, 99.6% of cases were reported from Africa. In the United States, wild rodent plague occurs primarily in ground squirrels and prairie dogs in the western part of the country. Human cases there occur sporadically, usually following exposure to wild rodents or their fleas. Approximately 10 people are diagnosed with plague each year in the United States. Five instances of primary plague pneumonia through cat-to-human transmission have been recorded. No person-to-person transmission has been documented in the United States since 1925.

H. Bioterrorism Potential

Category A Agent *Y. pestis* is considered a potential bioterrorism agent. If effectively disseminated, *Y. pestis* could cause a serious public health challenge in limiting casualties and controlling other repercussions. **All cases of plague need to be reported immediately by phone.** (See reporting requirements below).

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify potential sources of transmission in the United States (such as wild rodents or other animals).
- To identify sources of transmission and geographical areas of risk outside of the United States.
- To stop transmission from such sources.
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.
- To assess appropriate treatment.

B. Laboratory and Healthcare Provider Reporting Requirement

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider immediately report any suspected or confirmed case. Report any suspicion of plague called to your attention by a healthcare provider or any positive laboratory result pertaining to plague. Also, report any potential exposure to plague that may be the result of bioterrorism. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. If after business hours, call IDPH at the same number and instructions will be given on how to reach on-call staff.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides services for testing clinical specimens for *Yersinia pestis* and for confirmation of isolates from sentinel laboratories. Sentinel laboratories can send specimens (blood, tissue biopsies, discharge fluid, vesicle fluid, etc.) to SHL. Isolates submitted from other laboratories will be confirmed and/or identified. Additionally, SHL requests that all laboratories submit all isolates cultured for further identification as rapidly as possible, to aid in the public health surveillance necessary for this illness. SHL needs to be contacted before samples are submitted. For more information on submitting samples, contact SHL at 319-335-4500.

C. Local Public Health Agency (LPHA) Follow-up Responsibilities
Case Investigation

a. **The most important thing an LPHA can do if it learns of a suspect or confirmed case of plague, or a potential exposure that may be a bioterrorism event, is to**

immediately call IDPH, any time of the day or night. The number for the 24-hour disease reporting hotline is (800) 362-2736.

b. Case investigation of plague in Iowa residents will be directed by IDPH Center for Acute Disease Epidemiology. If a bioterrorism event is suspected, IDPH and other authorities will work closely with the local public health agency and provide instructions and information on how to proceed.
c. The local public health agency may asked to assist in investigating cases that live within their communities, including gathering the following:
   1) The case's name, age, address, phone number, status (hospitalized, at home, deceased), and parent/guardian information, if applicable.
   2) The name and phone number of the hospital where the case is or was hospitalized.
   3) The name and phone number of the case's attending physician.
   4) The name and phone number of the infection-control official at the hospital.
   5) The names and phone numbers of patients seen by a healthcare provider before hospitalization or of other hospitals if seen at more than one hospital.

d. Disease control is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below (in Section 4), in Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

- **Minimum Period of Isolation of Patient**
  Droplet Precautions are indicated when caring for patients with plague until pneumonia is excluded and appropriate antibiotic therapy has been initiated. In patients with pneumonic plague, Droplet Precautions should be maintained for 72 hours after starting treatment. For patients with bubonic plague, Standard Precautions are advised.

- **Minimum Period of Quarantine of Contacts**
  See Section 4) B, Protection of Contacts, below.

B. Protection of Contacts of a Case

- Cases with **pneumonic** plague are considered infectious throughout their symptomatic illness and for 72 hours following initiation of antibiotic treatment. People who have been in household or face-to-face contact with a case with pneumonic plague during the infectious period should be educated regarding signs and symptoms and recommended prophylaxis, and referred to their healthcare provider for antibiotic prophylaxis. They should be placed under surveillance for symptoms for 7 days. If contacts of a pneumonic plague case are unable to receive antibiotic prophylaxis, they should be placed under a strict quarantine for a 7-day period.
- **Bubonic** plague is generally not transmitted person-to-person. Quarantine would generally not be required.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If multiple cases of plague occur, or if an outbreak is suspected, an investigation to determine the source of infection and mode of transmission (*e.g.,* contact with diseased rodents) is needed. Plague in Iowa would most likely be associated with travel to the western part of the United States or another country with a known outbreak. Contact the Center for Acute Disease Epidemiology as soon as possible. The Center can help determine a course of action to prevent further cases and can perform surveillance for cases across county lines.

Note: If bioterrorism is suspected, IDPH and other authorities will work closely with local public health and public safety and provide instructions and information on how to proceed.

D. Preventive Measures

Personal Preventive Measures/Education

When handling the bubo aspirate and blood, laboratory personnel must use gloves and care to avoid aerosolization of these infected fluids. Laboratory workers who process the cultures should be alerted to take precautions; however, standard bacteriologic techniques that safeguard against skin contact with and aerosolization of cultures should be adequate.

To avoid plague, people should reduce the likelihood of being bitten by infected fleas or being exposed to patients with pneumonic plague by:

- Understanding the modes of transmission and heeding any plague advisories while visiting the southwest U.S.
- Preventing rodent access to food and shelter by ensuring appropriate storage and disposal of food, garbage and refuse.
- Using insect repellents while camping in rural plague-infected areas avoiding and reporting dead or sick animals to park rangers or public health authorities.
- Preventing flea infestations of pet dogs and cats.
- Avoiding unnecessary contact with rodents or rabbits, and using protective gloves if handling is necessary.

Additionally, a *Y. pestis* vaccine is recommended for persons whose occupations put them at high risk for exposure to *Y. pestis* or plague-infected rodents... Also, vaccine may be considered for persons traveling to, or residing in, areas with epizootic or epidemic plague.

National and International Travel

- For more information regarding national/international travel and plague, contact the CDC's Traveler's Health Office at (877) 394-8747 or through the Internet at www.cdc.gov/travel.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Plague can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2009 Red Book: Report of the Committee on Infectious Diseases.* 28th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009

CDC. Plague website. www.cdc.gov/plague/

Heymann, David L., ed., *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

Additional Resources

www.who.int/topics/plague/en/

Plague

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative
Organism: *Yersinia pestis* Antigen:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Negative ☐ Positive
Organism: *Yersinia pestis* Antigen:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Negative ☐ Positive
Organism: *Yersinia pestis* Antigen:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Type: Bubonic ☐ Yes ☐ No ☐ Unk Pharangeal ☐ Yes ☐ No ☐ Unk Pneumonic ☐ Yes ☐ No ☐ Unk Septicemic ☐ Yes ☐ No ☐ Unk

Fever: ☐ Yes ☐ No ☐ Unk Onset date: / / Highest known fever: _____ ☐ Celsius ☐ Fahrenheit

Cough: ☐ Yes ☐ No ☐ Unk Onset date: / / **Productive cough:** ☐ Yes ☐ No ☐ Unk Onset date: / /

Bubo: ☐ Yes ☐ No ☐ Unk Bubo: Cervical ☐ Left ☐ Right Auxillary ☐ Left ☐ Right Femoral ☐ Left ☐ Right Inguinal ☐ Left ☐ Right

Bubo size: _____ ☐ inches ☐ cent Tender: ☐ Yes ☐ No ☐ Unk

Chest x-ray: ☐ Yes ☐ No ☐ Unk Date: / / Result: _____

TREATMENT

Antibiotics prescribed: ☐ Yes ☐ No ☐ Unknown

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU # of days: _____
# of times a day: _____ Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU # of days: _____
# of times a day: _____ Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU # of days: _____
# of times a day: _____ Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.

EXPOSURE PERIOD | Onset | COMMUNICABLE PERIOD

The incubation period for **Plague** is 1-7 days.

Plague is typically spread by infected fleas. Plague may be spread person to person if there is contact with pus from suppurating buboes.

RISK FACTORS/TRAVEL

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk City in Iowa: ____________ Departure date: __/__/____ Return date: __/__/____

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk State: ______ City: ____________ Departure date: __/__/____ Return date: __/__/____

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk Country: ____________ Departure date: __/__/____ Return date: __/__/____

Worked with a Case: ☐ Yes ☐ No ☐ Unk From date: __/__/____ To date: __/__/____

Lived with another Case: ☐ Yes ☐ No ☐ Unk From date: __/__/____ To date: __/__/____

CONTACTS

Number of people living in case's household: _____

Others in contact or with the same exposures

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES: ______________________________

POLIOMYELITIS

Report Immediately by phone

Also known as: Polio, Polioviral Fever and Infantile Paralysis

Responsibilities:
Hospital: Report immediately by phone
Lab: Report immediately by phone, send isolate to University Hygienic Lab (ULH)
Physician: Report immediately by phone
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Polio is caused by poliovirus (genus *Enterovirus*), which has three serotypes. Type 1 virus is most frequently involved in epidemics and is most often isolated from paralytic cases of poliomyelitis. Type 3 and, to a lesser degree, types 1 and 2 can also cause paralysis. All three are contained in the vaccine.

B. Clinical Description

Infection with poliovirus results in a spectrum of manifestations. The overwhelming majority of infections (95%) are asymptomatic. About 4 – 8% of infected individuals will experience non-specific viral symptoms, such as a low-grade fever, headache, sore throat, nausea, abdominal pain, constipation, diarrhea, and/or vomiting (referred to as abortive disease). About 1–2% of infections will result in aseptic meningitis, involving stiffness of the back, neck and/or legs, at times with paresthesias, a few days after the minor illness has resolved. Less than 1% of infections will progress to acute flaccid paralysis (AFP) with loss of reflexes in the involved limbs, usually with fever present (paralytic poliomyelitis). Please note, today in the U.S., the most common cause of AFP is Guillain-Barré syndrome (GBS). Polio has been eradicated from the western hemisphere.

Progression to paralytic poliomyelitis usually occurs within 2 – 4 days and rarely continues after the fever subsides. Spinal paralysis is typically asymmetric and more severe proximally than distally. Paralysis may compromise respiration and swallowing. After the acute episode, many patients recover at least some muscle function and prognosis for recovery can usually be established within 6 months after onset of paralytic disease. Between 2 – 5% of paralytic infections in children are fatal, in adults it is up to 15 – 30%. Risk factors for paralytic disease include larger inoculum of poliovirus, increasing age, pregnancy, strenuous exercise, tonsillectomy, and intramuscular injections administered while the patient is infected with poliovirus.

C. Reservoirs

Humans are the only known host.

D. Modes of Transmission

The principal mode of transmission is person-to-person by the fecal-oral route. Transmission via oral secretions, such as saliva, is very uncommon but may account for some cases. In rare instances, the virus may be transmitted by contaminated sewage or water. Asymptomatic individuals, especially children, comprise a significant source of infections. No reliable evidence of spread by insects exists.

No long-term carrier state is known. In temperate climates, poliovirus infections are most common in the summer and fall.

E. Incubation period

Paralytic polio: The incubation period is usually 7 - 14 days, with a range of 3 - 35 days.

F. Period of Communicability or Infectious Period

The period of communicability is not precisely defined. It appears to be greatest 7 - 10 days before and after onset of clinical symptoms, when poliovirus is present in the throat and excreted in the highest quantities in the feces. Poliovirus can continue to be shed in the feces for 3 - 6 weeks. Poliovirus can be found in throat secretions as early as 36 hours and in the feces 72 hours after exposure to infection in both symptomatic and asymptomatic cases.

G. Epidemiology

Prior to the widespread use of polio vaccine, poliomyelitis occurred worldwide. Polio was epidemic in the U.S. for the first half of the 20th century with over 20,000 cases of paralytic disease in 1952. The first inactivated poliovirus vaccine (IPV) was introduced in 1955, monovalent oral poliovirus vaccine (OPV) in 1961, trivalent (TOPV) in 1963, and enhanced inactivated poliovirus vaccine (eIPV) in 1987. After the introduction of vaccination, the reported number of cases of poliomyelitis in the U.S. dropped to <100 in 1965 and <10 cases in 1973. The last cases of indigenously-transmitted wild-type poliovirus in the U.S. were in 1979. The last case of wild-type polio disease in the Western Hemisphere was detected in Peru in 1991. The Western Hemisphere was declared free from indigenous wild-type poliovirus transmission in 1994. Poliomyelitis is now on the verge of worldwide eradication.

Almost the entire world is now considered polio-free. Worldwide efforts to eradicate polio in the few countries where the disease is still endemic are underway. Strategies include: (1) achieving and maintaining high vaccination coverage among infants < 1 year old; (2) developing sensitive surveillance systems for AFP including a laboratory network; (3) conducting National Immunization Days; (4) and conducting “mopping-up” campaigns to directly target geographic areas known to be high risk for polio transmission. The number of countries where poliovirus continues to be isolated has decreased substantially, with Afghanistan, Egypt, India, Niger, Nigeria, and Pakistan the major areas of wild-type virus circulation.

Due to the success of global efforts towards eradication and the elimination of indigenously transmitted disease in the Western Hemisphere, cases of paralytic poliomyelitis in the industrialized countries have become almost non-existent. During the period 1980–94, there was an average of 8–9 cases of paralytic polio reported annually in the U.S. Most of these cases were vaccine-associated paralytic poliomyelitis (VAPP), which can occur after receipt of OPV. This very rare disease accounted for an average of 8 reported cases per year in the US, during the period 1980–94 (or 1 case for every 2.4 million doses of OPV distributed). The risk for VAPP is highest after receipt of the first dose of poliovirus vaccine, occurring at one case per 750,000 doses distributed. Since 1986, the only cases of paralytic poliomyelitis occurring in the US have been vaccine-associated.

In January 1997, in an effort to reduce the risk of VAPP, a sequential polio vaccination schedule (IPV for doses 1 and 2, OPV for doses 3 and 4) was recommended in the US. With the continued success of worldwide efforts to eradicate poliovirus and in the interest of completely eliminating the occurrence of VAPP, an all-IPV immunization schedule was initiated on January 1, 2000 in the US.

Despite the great achievement in polio eradication in the U.S., vigilance is needed because of the possibility of importation of wild poliovirus from areas of the world where it is endemic. The importation of wild poliovirus from polio-endemic regions of the world may occur among under-immunized (1) tourists, (2) immigrants revisiting their countries of origin, or (3) members of religious groups opposed to vaccination, regardless of travel history. In 1992–93 an outbreak occurred in the Netherlands among members of a religious group that refuse immunization. Poliovirus has also been

isolated from members of a similar religious group in Canada, although no cases of disease occurred. Polio remains endemic in three countries: Afghanistan, Nigeria and Pakistan. Transmission has been re-established in Angola, Chad, and the Democratic Republic of the Congo. Several more countries had ongoing outbreaks in 2011 due to importations of poliovirus.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To distinguish between wild-type and vaccine-associated polio and to identify susceptible people exposed to wild-type polio.
- To maintain indigenous transmission rates of wild-type poliovirus at zero.
- To identify cases of VAPP that might occur secondary to immunization with OPV given in another country.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report any suspected or confirmed cases of polio immediately. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. If after business hours, call IDPH at the same number and instructions will be given on how to reach on-call staff.

Laboratory Testing Services Available

After communicating with IDPH, contact the University of Iowa State Hygienic Laboratory (SHL) bacteriology department at (319) 335-4500 for further instructions.

The likelihood of poliovirus isolation is highest from stool specimens, intermediate from pharyngeal swabs, and very low from blood or spinal fluid. The isolation of poliovirus from stool specimens contributes to the diagnostic evaluation but does not constitute proof of a causal association of such viruses with paralytic poliomyelitis. Isolation of virus from the cerebrospinal fluid (CSF) is diagnostic but is rarely accomplished.

To increase the probability of poliovirus isolation, at least two stool specimens and two throat swabs should be obtained 24 hours apart from patients with suspected poliomyelitis as early in the course of the disease as possible (i.e., immediately after poliomyelitis is considered as a possible differential diagnosis), but ideally within the first 14 days after onset of paralytic diseased. Specimens should be sent to the State Hygienic Lab.

C. Local Public Health Agency Follow-up Responsibilities

Polio follow-up and case investigation is undertaken by the Local Public Health Agency (LPHA) and will be coordinated if necessary with IDPH Bureau of Disease Prevention and Immunization.

Initial Question to Ask Healthcare Provider and Patient

In order to assess the likelihood that a suspect case is a true case prior to laboratory testing, LPHA and/or other public health staff helping in the investigation should ask about: 1) clinical information, 2) polio immunization history of case and close contacts, 3) pertinent medical history including underlying illness/immunosuppression, 4) membership in religious/social group that might refuse immunization, 5) country of origin and length of residence in US, 6) recent history of travel (where and dates), 7) whether there were any recent out-of-town visitors (from where and dates), and 8) whether occupation entails handling of specimens that might contain poliovirus (*e.g.,* lab work).

3) CONTROLLING FURTHER SPREAD

A. Minimum Period of Isolation of a Suspect or Confirmed Case

Place case on enteric precautions for six weeks after onset of symptoms or until poliovirus can no longer be recovered from feces (the number of negative specimens needed will be determined by the IDPH on a case-by-case basis).

B. Minimum Period of Quarantine of Contacts

None.

C. Protection of Contacts of a Case

Implement control measures as described below while waiting for laboratory confirmation. While indigenous transmission of wild-type poliovirus in the United States (and the Western Hemisphere as a whole) has not occurred since 1991, the importation of poliovirus from polio-endemic regions may occur among under-immunized (1) tourists, (2) immigrants revisiting their countries of origin, or (3) members of religious groups who might refuse immunization, regardless of travel history. Polio-endemic regions include Afghanistan, Egypt, India, Niger, Nigeria, and Pakistan. An IDPH epidemiologist can help assess the likelihood of exposure to wild-type polio.

OPV is still being used outside of the U.S. Vaccine-associated paralytic poliomyelitis (VAPP) should also be considered as a cause of paralysis, especially if a patient has onset of paralysis after receipt of a first dose of OPV. No control measures are indicated if the case is determined to likely be VAPP. It is also possible that the case of paralysis is due to an infectious agent other than poliovirus, such as enterovirus, or due to some other noninfectious cause, and therefore not contagious. Therefore, it is crucial that laboratory testing be initiated to determine if the causative agent of paralysis is poliovirus and to differentiate wild-type from vaccine strain poliovirus.

Identify individuals or groups who may have been exposed to the case. Also, attempt to identify the route of introduction of poliovirus into the community. To identify these groups, think in terms of "zones of exposure" and consider members of the following groups:

- Household members
- School/ child care associates (students/attendees and staff)
- Staff and patients at medical facility where patient was cared for, especially if there was the potential for direct contact with feces or oral secretions
- Religious/social groups
- Sports teams and other extracurricular groups
- Bus mates
- Close friends
- Travelers from polio-endemic regions such as Afghanistan, Egypt, India, Niger, Nigeria, and Pakistan
- Any other persons who may have come in direct contact with the case's feces or oral secretions

Identify high-risk susceptibles who had contact with the case during infectious period:

- Pregnant women should be referred to their obstetricians. (In child care or school settings remember to determine whether teachers, student-teachers, staff or students are pregnant.)
- Immunocompromised individuals should be referred to their healthcare providers.
- Infants < 6 weeks old (who are too young to have been vaccinated) should be referred to their pediatricians.

Identify and vaccinate all other susceptibles $\geq$ 6 weeks old with IPV (if not contraindicated). These are individuals without proof of immunity, including those with medical or religious exemptions to immunization. Proof of immunity to poliovirus is defined as:

- For children (< 18 years of age): documentation of receipt of $\geq$ 4 doses of polio vaccine with a minimum interval of 4 weeks between doses; only 3 doses are needed when the third dose is given on or after the fourth birthday.
- For adults ($\geq$ 18 years of age): documentation of receipt of $\geq$ 3 doses of polio vaccine with a

minimum interval of 4 weeks between doses with documentation of ≥ 1 booster dose.

Remember, an individual who has received a primary series consisting of ≥ 3 doses of vaccine AND has received ≥ 1 booster dose does **NOT** need to receive another dose.

Note:

- Vaccinating an exposed individual who may be incubating poliovirus is not harmful. Immune globulin (IG) has been found to be of no value as postexposure prophylaxis and is not recommended. (If the use of OPV for a mass vaccination campaign to control a polio outbreak in the U.S. is indicated, the CDC will advise the IDPH on how to obtain an emergency supply of OPV, who should receive OPV, and any other pertinent control measures.)

Apply precautions and isolate/exclude as follows:

- Case: Place on enteric precautions and exclude for 6 weeks after onset or until virus can no longer be recovered from feces (the number of negative specimens needed will be determined on a case-by-case basis).
- Contacts: Administer IPV; do not exclude.

Surveillance

Active surveillance for acute flaccid paralysis and other symptoms of polio infection should continue for at least 2 incubation periods (*i.e.,* up to 70 days) beyond the onset of the last case in an area.

D. Preventive Measures

Vaccination, including routine childhood vaccination, catch-up vaccination of adolescents, and targeted vaccination of high-risk adult groups, is the best preventive measure against polio. Good personal hygiene (particularly proper handwashing) is also very important.

Routine Polio Childhood Immunization Recommendations

An all-IPV polio immunization schedule is now the recommended schedule. OPV is no longer recommended and is not available in the U.S. Four doses of IPV are usually needed to complete the primary series: doses are recommended at ages 2 months, 4 months, 6-18 months, and 4–6 years. At least 28 days are needed between doses, although a 6–8 week interval is preferred between doses 2 and 3 and a 6-month interval is preferred between doses 3 and 4. Only 3 doses are needed when the third dose is given on or after the fourth birthday. Polio vaccine is not routinely recommended for those ≥ 18 years unless there is potential for exposure.

Polio Vaccine and Adults

Routine vaccination of persons ≥18 years of age residing in the U.S. is not necessary. However, polio vaccination is indicated for the following groups:

- Laboratory workers who handle poliovirus;
- Healthcare workers caring for polio patients;
- Persons traveling to regions of the world where polio is endemic or epidemic.

Polio Vaccination and Travel

In assessing the risk to a traveler for polio transmission, healthcare providers are urged to determine first if their patients will truly be traveling to a polio endemic or epidemic area, including Afghanistan, Egypt, India, Niger, Nigeria, and Pakistan. Visit: www.cdc.gov/travel to obtain information on the risk of transmission of poliovirus in specific countries.

If travel to a polio-endemic or epidemic region is anticipated, please review the patient's history of polio immunization. Ninety percent or more of vaccine recipients develop protective immunity to all three poliovirus types after two doses, and at least 99% are immune following three doses.

- If the patient has received a complete primary series of ≥ 3 doses of polio vaccine, administer a booster dose of IPV. Remember, a single booster dose is all that is needed.
- If the patient is unimmunized or partially immunized, follow an accelerated schedule to complete as much of the series as possible before departure, as outlined in the table below:

Weeks Available	Accelerated IPV Schedule*
≥ 8 weeks	3 doses, given 4 weeks apart
4-7 weeks	2 doses, given 4 weeks apart
< 4 weeks	1 dose

*1st dose may be given as early as 6 weeks of age

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Polio can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

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IDPH. *Public Health (641) Chapter 1, Notification and Surveillance of Reportable Communicable and Infectious Diseases, Poisonings and Conditions* (Printed April 2004).

World Health Organization. www.polioeradication.org/Infectedcountries.aspx

FACT SHEET POLIOMYELITIS

Information for Health Professionals (Polio)

What is poliomyelitis?
A viral infection most often recognized by the acute onset of flaccid paralysis. Poliovirus infection occurs in the GI track with spread to the regional nodes and in a minority of cases, to the nervous system.

Who gets poliomyelitis?
Prior to the widespread use of polio vaccine, poliomyelitis occurred worldwide. Polio was epidemic in the U.S. for the first half of the 20th century with over 20,000 cases of paralytic disease in 1952. The first inactivated poliovirus vaccine (IPV) was introduced in 1955, monovalent oral poliovirus vaccine (OPV) in 1961, trivalent in 1963, and enhanced inactivated poliovirus vaccine (eIPV) in 1987. After the introduction of vaccination, the reported number of cases of poliomyelitis in the U.S. dropped to <100 in 1965 and <10 cases in 1973. The last cases of indigenously-transmitted wild-type poliovirus in the U.S. were in 1979. The last case of wild-type polio disease in the Western Hemisphere was detected in Peru in 1991. The Western Hemisphere was declared free from indigenous wild-type poliovirus transmission in 1994.

Almost the entire world is now considered polio-free. Worldwide efforts to eradicate polio in countries where the disease is still endemic are underway. Strategies include: (1) achieving and maintaining high vaccination coverage among infants < 1 year old; (2) developing sensitive surveillance systems for AFP and a laboratory network; (3) conducting National Immunization Days; (4) and conducting "mopping-up" campaigns to directly target geographic areas known to be high risk for polio transmission. The number of countries where poliovirus continues to be isolated has decreased substantially, with Afghanistan, Nigeria, and Pakistan remaining the major areas of wild-type virus circulation. War and civil unrest has helped fuel outbreaks of Polio in Chad, Angola, and the Congo.

How is the poliomyelitis spread?
The principal mode of transmission is person-to-person by the fecal-oral or oral-oral route, with the fecal-oral route predominating. Transmission via oral secretions, such as saliva, is possible and may account for some cases. In rare instances, the virus may be transmitted by contaminated sewage or water. Asymptomatic individuals, especially children, comprise a significant source of infections. No reliable evidence of spread by insects exists. No long-term carrier state is known. In temperate climates, poliovirus infections are most common in the summer and fall.

What are the symptoms?
Infection with poliovirus results in a spectrum of manifestations. The overwhelming majority of infections (95%) are clinically inapparent. Some 4 – 8% of infected individuals will experience non-specific viral symptoms, such as a low-grade fever, headache, sore throat, nausea, abdominal pain, constipation, diarrhea, and/or vomiting (abortive disease). Some 1–2% of infections will result in aseptic meningitis, involving stiffness of the back, neck and/or legs, at times with paresthesias, a few days after the minor illness has resolved. Less than 1% of infections will progress to acute flaccid paralysis (AFP) with loss of reflexes in the involved limbs, usually with fever present (paralytic poliomyelitis). Please note, today in the U.S., the most common cause of AFP is Guillain-Barré syndrome.

How soon do the symptoms appear?
Progression to paralytic poliomyelitis usually occurs within 2 – 4 days and rarely continues after the fever subsides.

How long can an infected person spread the virus?
The period of communicability is not precisely defined. It appears greatest 7-10 days before and after onset of clinical symptoms, when poliovirus is present in the throat and excreted in the highest quantities in the feces. Poliovirus can continue to be shed in the feces for 3 to 6 weeks. Poliovirus can be found in throat secretions as early as 36 hours and in the feces 72 hours after exposure to infection in both symptomatic and asymptomatic cases.

What are the criteria for significant exposure to poliomyelitis?
Identify individuals or groups who may have been exposed to the case. Also, attempt to identify the route of introduction of poliovirus into the community. To identify these groups, think in terms of "zones of exposure" and consider members of the following groups:

- Household members
- School/child care associates (students/attendees and staff)
- Staff and patients at medical facility where patient was cared for, especially if there was the potential for direct contact with feces or oral secretions
- Religious/social groups
- Sports teams and other extracurricular groups
- Bus mates
- Close friends
- Travelers from polio-endemic regions such Afghanistan, Egypt, India, Niger, Nigeria, and Pakistan
- Any other persons who may have come in direct contact with the case's feces or oral secretions

What are poliomyelitis isolation guidelines?
Place case on enteric precautions for six weeks after onset of symptoms or until poliovirus can no longer be recovered from feces (the number of negative specimens needed will be determined by the IDPH on a case-by-case basis).

Can a person get poliomyelitis again?
Adults who contract paralytic poliomyelitis during childhood may develop the post-polio syndrome 30 to 40 years later. Post-polio syndrome is characterized by slow onset of muscle pain and exacerbation of weakness.

What is the treatment for poliomyelitis?
None. Supportive treatment and attention during the acute illness to the complications of paralysis requires expert knowledge and equipment, especially for patients in need of respiratory assistance.

Is there a vaccine to prevent poliomyelitis?
Yes, there is a vaccine to protect against poliomyelitis. An all-IPV polio immunization schedule is now the recommended schedule. OPV is no longer recommended and is not available in the U.S. Four doses of IPV are usually needed to complete the primary series: doses are recommended at ages 2 months, 4 months, 6-18 months, and 4–6 years. At least 28 days are needed between doses, although a 6–8 week interval is preferred between doses 2 and 3 and a 6-month interval is preferred between doses 3 and 4. Only 3 doses are needed when the third dose is given on or after the fourth birthday. Polio vaccine is not routinely recommended for those $\geq$ 18 years unless there is potential for exposure.

Routine vaccination of persons $\geq$18 years old residing in the U.S. is not necessary. However, polio vaccination is indicated for the following groups:

- Laboratory workers who handle poliovirus;
- Healthcare workers caring for polio patients;
- Persons traveling to regions of the world where polio is endemic or epidemic.

Poliomyelitis

Agency:

Investigator:

Phone number:

FOR STATE USE ONLY

Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case

Reviewer initials:

Referred to another state:

CASE

Last name:

First and middle name:

Maiden name: Suffix:

Address line:

Zip: City:

State: County:

Phone: ( )- - Type:

Long-term care resident: ☐ Yes ☐ No ☐ Unknown

Facility name:

Date of Birth: / / Estimated? ☐ Age:

Gender: ☐ Female ☐ Male ☐ Other

Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed

Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Parent/Guardian name:

Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name:

Exposure setting:

Epi-linked: ☐ Yes ☐ No ☐ Unknown

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: Country:

Healthcare provider information

Last name:

First name:

Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA

Facility name:

Address line 1:

Address line 2:

Zip code: City:

State: County:

Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Result date: / /

Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative

Organism: **Poliovirus** Type:

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Result date: / /

Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative

Organism: **Poliovirus** Type:

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Result date: / /

Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative

Organism: **Poliovirus** Type:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms

Paralysis: ☐ Yes ☐ No ☐ Unk Onset date: / / Paralysis sites: _____

Fever ☐ Yes ☐ No ☐ Unk
Headache ☐ Yes ☐ No ☐ Unk
Muscle pain ☐ Yes ☐ No ☐ Unk
Nausea ☐ Yes ☐ No ☐ Unk
Paralysis ☐ Yes ☐ No ☐ Unk
Stiff neck ☐ Yes ☐ No ☐ Unk
Trouble swallowing ☐ Yes ☐ No ☐ Unk
Vomiting ☐ Yes ☐ No ☐ Unk

Tensilon test performed: ☐ Yes ☐ No ☐ Unk
Date of test: / /
Results: ☐ Positive ☐ Equivocal ☐ Negative ☐ Unknown

EMG performed: ☐ Yes ☐ No ☐ Unk
Date of test: / /
Results compatible with polio: ☐ Yes ☐ No ☐ Unk

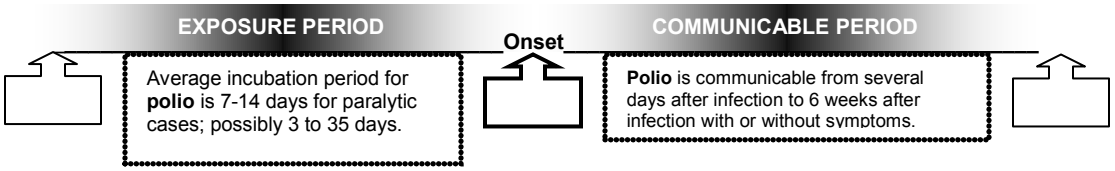
Nerve conduction test performed: ☐ Yes ☐ No ☐ Unk
Date of test: / /
Result:

60-day residual symptoms: ☐ Yes ☐ No ☐ Unk

Fever ☐ Yes ☐ No ☐ Unk
Headache ☐ Yes ☐ No ☐ Unk
Muscle pain ☐ Yes ☐ No ☐ Unk
Nausea ☐ Yes ☐ No ☐ Unk
Paralysis ☐ Yes ☐ No ☐ Unk
Stiff neck ☐ Yes ☐ No ☐ Unk
Trouble swallowing ☐ Yes ☐ No ☐ Unk
Vomiting ☐ Yes ☐ No ☐ Unk

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated for Polio? ☐ Yes ☐ No ☐ Unknown

Date vaccinated:	/ /	Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:		Lot #:	
Vaccine type:		Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:		Manufacturer:	

Number of vaccinations: ____

In the 35 days prior to the onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Exposed to potential cases: ☐ Yes ☐ No ☐ Unk — Country outside U.S.: _____ — From date: / / — To date: / /

Work with a case: ☐ Yes ☐ No ☐ Unk — From date: / / — To date: / /

Lived with another case: ☐ Yes ☐ No ☐ Unk — From date: / / — To date: / /

Contact w/t OPV recipient: ☐ Yes ☐ No ☐ Unk — Lived w/t recipient: ☐ Yes ☐ No ☐ Unk — Age of recipient: _____

Recipient relationship: ☐ Child care contact ☐ Close contact not living in household ☐ Household

CONTACTS

Number of people living in case's household: ____

Close contacts with similar symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		/ /	☐ Yes
☐ Child	☐ Family member (non-household)			☐ No
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		/ /	☐ Yes
☐ Child	☐ Family member (non-household)			☐ No
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

NOTES:

PSITTACOSIS

Potential Bioterrorism Agent: Category B

Also known as: Parrott fever, Omithosis

Responsibilities:
Hospital: Report by IDSS, mail, facsimile, or phone
Lab: Report by IDSS, mail, facsimile, or phone
Physician: Report by mail, facsimile, or phone
Local Public Health Agency (LPHA): Report by IDSS, mail, facsimile, or phone. Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Chlamydia psittaci is the bacterium that causes psittacosis. It is an obligate intracellular parasite.

B. Clinical Description

Symptoms can include high fever, headache, rash, myalgia (muscle aches), chills, and upper or lower respiratory tract disease. A cough may or may not be present.

Onset of respiratory symptoms often seem milder than expected based on chest x-ray findings.

Complications such as systemic illness can occur with pneumonia. Human disease can be severe (including encephalitis and myocarditis), especially in untreated elderly people, although it is usually mild or moderate for others. Relapses of illness may occur. Occasionally fatal in untreated patients.

C. Reservoirs

Common reservoirs *C. psittaci* is found primarily in psittacine birds (parrots, parakeets, macaws, love birds, and cockatoos); pigeons and some poultry (turkeys, geese and ducks) may also shed the infectious agent.

D. Modes of Transmission

Spread: Pet birds, especially psittacine birds are often implicated, especially when owners clean a cage with dried droppings. Occupational exposure can also occur when workers are exposed to areas with contaminated dust during clean up, repair or demolition. Laboratory infections have occurred as well. Farms or rendering plants may be a source of exposure for workers. Many seemingly healthy birds may shed the agent when stressed by crowding or transport. Dramatic outbreaks may occur in poultry packing plant workers.

Airborne: Human illness occurs from inhalation of the bacteria in dried droppings, secretions, and dust from feathers of infected birds.

Person-to-person: transmission (through paroxysmal coughing during acute illness) has only rarely been reported.

E. Incubation period

The incubation period for psittacosis can range from 1–4 weeks, but it is usually 7 - 14 days.

F. Period of Communicability or Infectious Period

Infected birds, including those that appear to be healthy, can be lifetime carriers or have continuous or intermittent shedding periods of weeks or even months. If humans are contagious at all, it is during paroxysmal coughing with acute illness.

G. Epidemiology

Psittacosis occurs worldwide and in all seasons, with some increase in winter months owing to maintaining the agent in ambient air. Most human cases are sporadic and are usually confined within families. Human outbreaks of psittacosis occasionally occur in individual households, pet shops, aviaries, and avian exhibits in zoos. Outbreaks among birds can occur in poultry flocks or other groups of birds such as in pet stores. Quarantine of imported birds and treatment of birds with antibiotics reduces the risk of disease transmission from birds.

In Iowa no cases have been reported in the last 5 years.

H. Bioterrorism Potential

Category B Agent: Psittacosis has been identified as a potential category B bioterrorism agent as a respiratory threat.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify and control outbreaks.
- To help identify the source (*e.g.,* pet stores, workers in a facility with excess dust or unrecognized bird droppings) and prevent further transmission.
- To monitor the emergence of psittacosis in new areas and new risk groups.
- To design more effective control or prevention methods.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website:
healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Consult with CADE (1-800-362-2736) or the University of Iowa State Hygienic Laboratory (SHL) (319-335-4500) concerning proper specimen collection and testing.
Report any of the following:

- Isolation of *C. psittaci* from respiratory secretions; or
- Fourfold or greater increase in antibody against *C. psittaci* by complement fixation (CF); or microimmunofluorescence (MIF) to a reciprocal titer of greater than or equal to 32 between paired acute- and convalescent-phase serum specimens ; or
- Presence of immunoglobulin M antibody (IgM) against *C. psittaci* by MIF to a reciprocal titer of greater than or equal to 16.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a. It is the LPHA responsibility to complete a case investigation by interviewing the case and others who may be able to provide pertinent information. Much of the information can be obtained from the case's healthcare provider or the medical record.
b. Use the following guidelines to complete the IDSS form:
    1) Accurately record the demographic information (including full name and address), date of symptom onset, healthcare provider information, whether hospitalized (including location and associated dates), therapy received, and outcome of disease (*e.g.,* recovered, died).
    2) Diagnostic tests: Complete questions on the type(s), date(s), and result(s) of any diagnostic tests.
    3) Exposure history: Use the approximate incubation period range for psittacosis (1–4 weeks). Specifically, focus on the period beginning about 1 week prior to the case's onset date back to approximately 4 weeks before onset for the following exposures:
        a) Occupation/duties: Determine the occupation of the case. Determine whether the case had any occupational exposure to birds or other animals (*e.g.,* farmer, pet store worker, poultry plant worker).
        b) Bird contact: Ask the case about contact with birds (psittacine birds, pigeons, domestic fowl, or other birds). If possible, indicate the type, number of birds, and health of the birds to which the case was exposed.
        c) Contact with a human case of psittacosis: Ask the case if he/she had recent contact with a person with pneumonia.
        d) Indicate where and when any of the above exposures occurred.
    4) Investigation of source: Record any information regarding the testing of birds suspected as the case's source of infection.
    5) If several unsuccessful attempts have been made to obtain case information, (*e.g.,* the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), complete the IDSS form with as much information as possible. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.
c. Complete the form in IDSS or, if mailing, attach the lab report(s) and mail (in an envelope marked "Confidential") to IDPH the Center for Acute Disease Epidemiology. The mailing address is:

    IDPH, CADE
    Lucas State Office Building, 5th Floor
    321 E. 12th Street
    Des Moines, IA 50319-0075

d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Disease in Birds

Psittacosis diagnosed in a bird is reportable to the Iowa Dept. of Agriculture and Land Stewardship (IDALS). They in turn will notify the Center for Acute Disease Epidemiology (CADE). If evidence suggests that humans have been exposed to infected birds or become sick with psittacosis, the local

board of health will be asked to assist CADE in investigating the situation, ensuring that any sick persons receive medical attention, and educating exposed individuals about their potential risk. In cases without human illness, the local board of health should be aware of the situation so that concerned individuals can be given information about psittacosis, their risk of exposure, and the need to see a physician if they have been exposed and develop respiratory illness.

When a bird in or purchased from a pet store has been diagnosed with psittacosis, whether or not human cases have occurred as a result of exposure to the diseased bird, control measures in birds will be instituted by the IDALS. These measures include quarantine and treating exposed birds and properly disinfecting cages and other surfaces. Other control measures, including notifying the pet store owner and workers of the diagnosis and their possible risk of disease, and notifying the public who may have visited the store by posting public health notices at the store, will be made in collaboration with CADE. Also, depending on the situation, CADE may contact individuals who have purchased birds from the facility to inform them about psittacosis, the possibility that their birds may be carriers, and the potential risks to their health.
In addition to pet shops and veterinary offices, other high-risk environments in which psittacosis can occur include poultry farms and specialty bird shows. Where a diseased bird is identified, control measures similar to those described above (*e.g.,* quarantine and treating exposed birds, disinfecting the animal's environment and notifying exposed individuals about their disease risk) will be instituted by IDALS in conjunction with CADE.

Contact the Iowa Department of Agriculture and Land Stewardship (IDALS), (515) 281-8601 (after hours 515-242-0247) with question about the disease in animals. For information about the risk to humans, contact CADE at (800) 362-2736, if after hours instructions will be given on hours to reach on-call staff

Reported Incidence Is Higher than Usual/Outbreak Suspected

If an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle, such as a cluster of sick birds in a pet store, should be sought and applicable preventive or control measures should be instituted. Consult with the epidemiologist on-call at CADE at (800) 362-2736. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross jurisdictions and therefore be difficult to identify at a local level.

D. Preventive Measures

To avoid exposure IDPH recommends:

- Obtain birds only from a licensed pet store or aviary.
- Pet owners and animal handlers should be made aware of the dangers of household or occupational exposure to infected birds and the risk of inhalation of dried bird droppings, even from seemingly healthy birds.
- Medical personnel who take care of people in poultry processing plants or other workers in high-risk occupations should learn to include psittacosis in their differential diagnosis for workers who become sick with febrile illness and myalgia.
- Psittacine birds that are bought, traded, or otherwise procured should be raised and handled in a way that prohibits psittacosis spread. Tetracycline can be used to control or prevent disease in birds, although treatment failures can occur.
- Pet stores, farms, or processing plants that are epidemiologically linked to human psittacosis should be part of a surveillance effort to identify other cases. Any infected birds should be treated or destroyed, and the environs should be thoroughly disinfected.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions Psittacosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.

Heymann, David L., ed., *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

National Association of State Public Health Veterinarians. *Compendium of Measures to Control Chlamydia psittaci Infection among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2004.* National Association of State Public Health Veterinarians, Inc., 2004.

Resources

www.cdc.gov/ncidod/dbmd/diseaseinfo/psittacosis_t.htm

FACT SHEET

PSITTACOSIS

(Parrot fever, Omithosis)

What is psittacosis?
Psittacosis is a disease found primarily in certain birds (parrots, parakeets) and other poultry (turkeys, geese and ducks, as well as other birds such as pigeons) that can be transmitted to humans.

What are the symptoms of psittacosis?
Symptoms include fever, headache, rash, muscle aches, chills, and upper or lower respiratory disease. Human disease can be severe, especially for untreated elderly people, but it is most often mild or moderate in others.

How soon do symptoms appear?
Symptoms can take from 1-4 weeks to appear, but it is usually 1-2 weeks.

How is psittacosis spread?
Human illness occurs from breathing in bacteria from dried droppings, secretions, and dust from feathers of infected birds. Many seemingly healthy birds have the bacteria and they can spread it when stressed from travel or crowding. Pet birds are often the source for human infection.

Who gets psittacosis infection?
Anyone can get psittacosis if they are exposed to the dust and droppings of infected birds.

How long is a person infectious?
This isn't certain. Most people aren't very contagious, and if so, only when there is severe coughing from the disease. Birds can have lifelong infections.

What is the treatment for this illness?
Tetracycline type antibiotics are used to treat this disease.

Do infected people need to be excluded from school, work, or child care?
No. People who are infected and have a cough should be instructed to cough into a tissue or a handkerchief.

What can be done to help prevent the spread of psittacosis?

- Obtain birds only from a licensed pet store or aviary.
- Pet owners and animal handlers should be made aware of the dangers of household or occupational exposure to infected birds and the risk of inhalation of dried bird droppings, even from seemingly healthy birds.
- Special care should be taken by bird owners to clean cages, etc with the least amount of disturbance of dried droppings, feathers, and dust.
- Birds that are bought, traded, or otherwise procured should be raised and handled in a way that prohibits psittacosis spread.

NATIONAL ASSOCIATION of STATE PUBLIC HEALTH VETERINARIANS, INC.

TO: State Public Health Veterinarians
State Epidemiologists
State Veterinarians
Interested Pet Bird Professionals

FROM: Kathleen A. Smith, DVM MPH
Chair, Psittacosis Compendium

RE: *Compendium of Measures To Control Chlamydophila psittaci Infection Among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2009*

On behalf of the National Association of State Public Health Veterinarians, I am pleased to provide you with a copy of the *Compendium of Measures to Control Chlamydophila psittaci Infection Among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2009*. The Compendium committee and consultants believe these updates and revisions will aid public health officials, physicians, veterinarians, and the pet bird industry to control this disease in birds and in people.

This Compendium updates the 2008 Compendium. Notable changes in the 2009 Compendium are as follows:

Infection in Humans, Laboratory Testing

- At the time of this report, microimmunofluorescence (MIF) testing kits will no longer be available through FOCUS Diagnostic Laboratories. As a result, the committee recommends that the individual laboratories listed in Table 1 be contacted directly to ascertain the testing options they provide for human specimens.

Appendix 1: Testing Methods for *C. psittaci* in Birds:

- Elementary Body Agglutination (EBA) testing is no longer being offered by Texas Veterinary Medical Diagnostic Laboratory. It is still described under the section titled "Tests for antibodies" as other laboratories may conduct this test in the future

Appendix 2: Treatment Options for Birds with Avian Chlamydiosis:

- The "Recommendations for Treating and Caring for Infected and Exposed Birds" section was moved from the Prevention and Control Recommendation section in the main document to the beginning of Appendix 2. These recommendations are critical for

treatment success and placing them in the treatment section ensures a greater likelihood that they will be reviewed.

- A statement was added that it is important for avian facility managers to provide employees with simple, concise written treatment procedures to ensure treatment success.

- More emphasis is placed on recommending doxycycline over other tetracycline antibiotics for the treatment of avian chlamydiosis

- Routine prophylactic antibiotic treatment is now discouraged as it may cause adverse effects and could generate resistant strains of *C. psittaci* and other bacteria.

The final, and probably the most significant, update is that the Centers for Disease Control and Prevention (CDC) and the University of Georgia College of Veterinary Medicine have collaborated on the development of a new diagnostic test for *C. psittaci*.[i]

Genetic studies have indicated that there are at least seven avian genotypes of *C. psittaci*. Distinguishing these serotypes currently requires multiple confirmatory tests and is very time consuming. A real-time polymerase chain reaction (PCR) assay, targeting the ompA gene has been developed which uses Light Upon extension (LUX ^{TM}) chemistry and high resolution melt (HRM) analysis that can accurately and quickly differentiate these genotypes. This test may become a valuable epidemiologic tool to evaluate human outbreaks and link human/avian transmission in the future. The CDC is interested in applying this diagnostic tool in select cases or outbreaks. Therefore, if you have suspect human cases and are willing to submit samples for molecular testing, please contact:

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To help control this disease and protect public health, the Compendium committee and its consultants encourage you to distribute this 2009 version of the Compendium to health officials, veterinarians, and the pet bird industry in your state and actively promote the document as a standard. We would also like to request that if you update any web links to this document that you please delete any previous Compendiums, as we want to ensure that interested people access the most current version.

This document will be reviewed and updated on an as needed basis. The most recent version, along with sample case report forms and associated client materials can be accessed on the National Association of State Public Health Veterinarians website at http://www.nasphv.org.

[i] Mitchel, S.L. Wolf, B.J. et al, Genotyping of Chlamydophila psittaci using Real-Time PCR and High Resolution melt Analysis. *J Clin Microbiol* 2009;47:175-181

Compendium of Measures To Control *Chlamydophila psittaci* Infection Among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2009

National Association of State Public Health Veterinarians (NASPHV)

SUMMARY

Psittacosis, also known as parrot fever and ornithosis, is a bacterial infection of humans that can cause severe pneumonia and other serious health problems. It is caused by *Chlamydophila psittaci*, formerly known as *Chlamydia psittaci***.** From 2002 through 2007, 91 human cases of psittacosis were reported to the Centers for Disease Control and most resulted from exposure to infected pet birds, usually cockatiels, parakeets, parrots, and macaws. In birds, *C psittaci* infection is referred to as avian chlamydiosis. Infected birds shed the bacteria through feces and nasal discharges, and humans become infected from exposure to these materials. This compendium provides information about psittacosis and avian chlamydiosis to public health officials, physicians, veterinarians, the pet bird industry, and others concerned with controlling these diseases and protecting public health. The recommendations in this compendium provide standardized procedures for controlling avian chlamydiosis in birds, a vital step to protecting human health. This document will be reviewed and revised as necessary.

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INTRODUCTION

Chlamydophila psittaci is a member of the family *Chlamydiaceae.* Currently there are eight serovars and nine genotypes described which in the future may prove of importance in the epidemiology of the disease in animals and humans[1]. In some cases, these obligate intracellular bacteria can be transmitted from birds to humans. In humans, the resulting infection is referred to as psittacosis (also known as parrot fever and ornithosis). Psittacosis typically causes influenza-like symptoms and can lead to severe pneumonia and nonrespiratory health problems. With appropriate treatment, the disease is rarely fatal. From 2002 to 2007, 91 human cases of psittacosis were reported to the CDC (mean 15, range 12-21)[2]. This is likely an underrepresentation of the actual number as milder cases may not seek medical attention or be reported. Persons at risk include those exposed to pet birds, pigeons, and poultry and in specific occupations such as laboratory and wildlife workers. Human infection can result from brief exposure to infected birds or their contaminated excretions or secretions.

In this compendium, *C psittaci* infection in birds is referred to as avian chlamydiosis. Chlamydial organisms have been isolated from over 460 bird species from 30 orders[3] but are most commonly identified in psittacine (parrot-type) birds, especially cockatiels and budgerigars (also called parakeets or budgies). Among caged, nonpsittacine birds, infection with *Chlamydiaceae* organisms occurs most frequently in pigeons and doves. Avian chlamydiosis can occur but is infrequently diagnosed in canaries and finches.[4] The recommendations in this compendium provide standardized procedures for controlling avian chlamydiosis in the pet bird population, an essential step in efforts to control psittacosis among humans. This compendium is intended to guide public health officials, physicians, veterinarians, the pet bird industry, and others concerned with the control of *C psittaci* infection and the protection of public health.

INFECTION IN HUMANS (PSITTACOSIS)

Transmission

The disease resulting from *C psittaci* infection in humans is called psittacosis and most infections are typically acquired from exposure to psittacine birds. Transmission has also been documented from poultry and free-ranging birds, including doves, pigeons, birds of prey and shore birds. Infection with *C psittaci* usually occurs when a person inhales organisms that have been aerosolized from dried feces or respiratory tract secretions of infected birds. Other means of exposure include mouth-to-beak contact and handling infected birds' plumage and tissues. Even brief exposures can lead to symptomatic infection; therefore, certain patients with psittacosis might not recall or report having any contact with birds. Currently, pet birds are thought to pose a low risk to immunocompromized persons.[5] Person-to-person transmission has been suggested but not proven.[6] Standard infection-control precautions are sufficient for humans with psittacosis, and specific isolation procedures (e.g., private room, negative pressure air flow, and masks) are not indicated.

Clinical Signs and Symptoms

The onset of illness typically follows an incubation period of 5 to 14 days, but longer periods have been reported. The severity of the disease ranges from inapparent illness to systemic illness with severe pneumonia. Before antimicrobial agents were available, 15% to 20% of humans with *C psittaci* infection died. Currently, mortality is extremely rare. Humans with symptomatic infections typically have abrupt onset of fever, chills, headache, malaise, and myalgia. They usually develop a nonproductive cough that can be accompanied by

breathing difficulty and chest tightness. A pulse-temperature dissociation (fever without increased pulse rate), enlarged spleen, and nonspecific rash are sometimes observed. Auscultatory findings may underestimate the extent of pulmonary involvement. Radiographic findings may include lobar or interstitial infiltrates. The differential diagnosis of pneumonia caused by psittacosis includes infection with *Coxiella burnetii, Histoplasma capsulatum, Mycoplasma pneumoniae, Legionella* spp*, C. pneumoniae* or other *Chlamydiaceae*, and respiratory viruses such as influenza. *Chlamydophila psittaci* can affect organ systems other than the respiratory tract, resulting in endocarditis, myocarditis, hepatitis, arthritis, keratoconjunctivitis, encephalitis, and more recently, ocular adnexa lymphoma.[7]. Severe illness with respiratory failure, thrombocytopenia, and hepatitis has been reported.

Case Definition

The CDC and the Council of State and Territorial Epidemiologists (CSTE) have established case definitions for epidemiologic surveillance.[8] These definitions should not be used as the sole criteria for establishing a clinical diagnosis or determining medical management. A patient is considered to have a confirmed case of psittacosis if clinical illness is compatible with psittacosis and the case is laboratory confirmed by one of three methods:

- *C psittaci* is cultured from respiratory secretions,
- there is a 4-fold or greater increase in antibody against *C psittaci* by complement fixation (CF) or microimmunofluorescence (MIF) to a reciprocal titer of ≥32 between paired acute- and convalescent-phase serum samples, or
- there is presence of immunoglobulin M antibodies against *C psittaci* by MIF to a reciprocal titer of ≥16.

A patient is considered to have a probable case of psittacosis if clinical illness is compatible with psittacosis and the patient is epidemiologically linked to a confirmed case (either an avian case or has common exposure with another human case) or the patient has supportive serology (e.g., a single antibody titer of ≥32, detected by CF or MIF in at least one serum sample obtained after onset of symptoms).

Diagnosis

Most diagnoses are established by clinical presentation and positive antibodies against C. psittaci in paired sera using MIF. The MIF is more sensitive and specific than the previously used CF tests; however, there is still some cross-reactivity with other chlamydiae, such as *C. pneumoniae*, *C. trachomatis*, and *C. felis*. Acute-phase serum specimens should be obtained as soon as possible after onset of symptoms, and convalescent-phase serum specimens should be obtained at least two weeks after the first specimen. Because antimicrobial treatment can delay or diminish the antibody response, a third serum sample 4-6 weeks after the acute sample might help confirm the diagnosis. Acute and convalescent sera should be tested simultaneously at the same laboratory.

The infectious agent can also be isolated from the patient's sputum, pleural fluid, or clotted blood during acute illness and before treatment with antimicrobial agents; however, culture of *C. psittaci* is performed by few laboratories because of technical difficulty and safety concerns. Certain polymerase chain reaction (PCR) assays can be used to document organism nucleic acid in clinical samples to distinguish *C psittaci* from other chlamydial species and to genotype *C. psittaci* amplicons.[9] Because proper sample collection techniques and handling are critical for obtaining accurate test results, clinical laboratories should be contacted for specifics on specimen submission.

Laboratories that Test Human Specimens for *Chlamydiaceae*

Information about laboratory testing is available from state public health departments. Few commercial laboratories have the capability to differentiate chlamydial species by MIF. Certain laboratories accept human specimens to confirm *C. psittaci* infection **(**Table 1**)**. Other sources might be available.

Table 1: Laboratories that test human specimens for *Chlamydophila psittaci*

Laboratory	Tests Performed	Telephone Number Website
Focus Diagnostics (Quest subsidiary) Cypress, CA	MIF (IgM, IgA, IgG) Culture	(800) 445-4032 www.focusdx.com
Laboratory Corp of America Burlington, NC	MIF (IgM, IgG)Culture	(800) 222-7566 www.labcorp.com
Specialty Labs, Santa Monica, CA	MIF (IgM, IgG, IgA) PCR (pleural fluid only)	(800) 421-4449 www.specialtylabs.com
Viromed Minnetonka, MN	MIF (IgG, IgM)Culture	(800) 582-0077 www.viromed.com
Response and Surveillance Laboratory, Respiratory Diseases Branch, CDC Atlanta, GA**	MIF (requires paired sera),PCR, Culture, genotyping (multiple specimen types)	(404) 639-4921

*MIF = microimmunofluorescence, PCR = polymerase chain reaction assay
**CDC is a reference laboratory and samples must be submitted through State Health Departments

Treatment

Tetracycline antibiotics are the drug of choice for *C. psittaci* infection in humans. Mild to moderate cases can be treated with oral doxycycline (100 mg every 12 hours) or tetracycline hydrochloride (500 mg every six hours) for a minimum of 10 days. Severely ill patients should be treated with IV doxycycline hyclate (4.4mg/kg/day divided into two infusions, maximum 100 mg/dose). Antibiotic therapy should be continued for at least 10-14 days after fever abates. Most *C. psittaci* infections are responsive to antibiotics within 1-2 days, however relapses can occur. Although in-vivo efficacy has not been determined, macrolide antibiotics are considered the best alternative agents in patients for whom tetracyclines are contraindicated (e.g. children <8 years of age, pregnant women, and persons allergic to tetracyclines).[10]

INFECTION IN BIRDS (AVIAN CHLAMYDIOSIS)

Transmission

C. psittaci is excreted in the feces and nasal discharges of infected birds. The organism is environmentally labile but can remain infectious for over a month if protected by organic debris (e.g., litter and feces). Some infected birds can appear healthy and shed the organism intermittently. Shedding can be exacerbated by stress factors, including reproductive activities, relocation, shipping, crowding and chilling.

Clinical signs

The usual duration between exposure to *C. psittaci* and onset of illness ranges from 3 days to several weeks. However, active disease can appear with no identifiable exposure. Whether the bird has acute or chronic signs of illness or dies depend on the species of bird, virulence of the strain, infectious dose, stress factors, age and extent of treatment or prophylaxis.

Signs of avian chlamydiosis are non-specific and include lethargy, anorexia and ruffled feathers. Other signs include serous or mucopurulent ocular or nasal discharge, diarrhea and excretion of green to yellow-green urates. Severely affected birds may become anorectic and produce sparse, dark green droppings, followed by emaciation, dehydration and death.

Case Definitions

Clinical signs may not always be evident in all infected birds. A confirmed case of avian chlamydial infection is defined on the basis of one of the following:

- isolation of *C. psittaci* from a clinical specimen,

- identification of chlamydial antigen by use of immunofluorescence (fluorescent antibody) on the bird's tissues,
- a ≥ 4-fold change in serologic titer in two specimens from the bird obtained at least two weeks apart and assayed simultaneously at the same laboratory, or
- identification of *Chlamydiaceae* within macrophages in smears or tissues (e.g. liver, conjunctival, spleen, respiratory secretions) stained with Gimenez or Macchiavello stain. Clinical signs may not be evident.

A probable case of avian chlamydial infection is defined as compatible illness and one of the following:
- a single high serologic titer as defined by the laboratory in a specimen obtained after onset of signs or
- *Chlamydiaceae* antigen (identified by use of enzyme-linked immunosorbent assay [ELISA], PCR, or fluorescent antibody) in feces, a cloacal swab specimen or respiratory tract or ocular exudates.

A suspected case of avian chlamydial infection is defined as:
- a compatible illness that is not laboratory confirmed but is epidemiologically linked to a confirmed case in a human or bird,
- a bird with no clinical signs and a single high serologic titer or detection of chlamydial antigen,
- compatible illness with positive results from a nonstandardized test or a new investigational test, or
- compatible illness that is responsive to appropriate therapy.

Diagnosis

Several diagnostic methods are available for identifying avian chlamydiosis in birds (see Appendix 1)

Treatment

Treatment should be supervised by a licensed veterinarian (see Appendix 2).

PREVENTION AND CONTROL RECOMMENDATIONS

Aviary and pet shop owners are encouraged to implement recommendations such as those described in the Model Aviary Program.[11] Such programs encourage disease prevention and improve animal health and the human-animal bond. To prevent transmission of *C. psittaci* to humans and birds, specific control measures are recommended:

- **Educate persons at risk.** Inform all persons in contact with birds or bird-contaminated materials about the zoonotic nature of the disease. By the time infection is recognized in a group of birds, a critical period for pathogen accumulation and dissemination has already occurred. Bird caretakers with respiratory or influenza-like symptoms should seek medical attention and inform their health care provider about bird contact.
- **Protect persons at risk.** When cleaning cages or handling potentially infected birds, caretakers should wear protective clothing, which includes gloves, eyewear, a disposable surgical cap, and an appropriately fitted respirator[12] with N95 or higher rating. Surgical masks might not be effective in preventing transmission of *C. psittaci*. In addition, necropsies of potentially infected birds should be performed in a biological safety cabinet. Wet the carcass with detergent and water to prevent aerosolization of infectious particles.
- **Maintain accurate records of all bird-related transactions for at least one year to aid in identifying sources of infected birds and potentially exposed persons.** Records should include the date of purchase, species of birds purchased, individual bird identification, source of birds, and any identified illnesses or deaths among birds. In addition, the seller should record the name, address, and telephone number of the customer and individual bird identification (e.g., band or microchip number).
- **Avoid purchasing or selling birds that have signs consistent with avian chlamydiosis.** Signs are nonspecific and may include lethargy, ocular or nasal discharge, diarrhea, ruffled feathers or low body weight.

- **Avoid mixing birds from multiple sources**. To prevent epornitics (disease outbreaks) and pathogen transmission to humans, additional control and prevention methods (e.g. health screening, extended quarantine) may be required when birds from multiple sources are mixed.
- **Quarantine newly acquired or exposed and isolate ill birds.** Isolation should include housing in a separate air space from other birds and noncaretakers. Quarantine birds, including those that have been to shows, exhibitions, fairs, and other events for at least 30 days and test before adding them to a group.
- Test birds before they are to be boarded or sold on consignment. House them in a room separate from other birds pending test results (see Appendix 1).
- **Screen birds with frequent public contact (e.g., bird encounters, long term care facilities, schools)**. Such testing may be used to reduce potential human exposure from birds. Specific protocols should be established in consultation with a veterinarian, recognizing that some birds may demonstrate persistent IgG antibodies in the absence of active infection (see Appendix 1).
- **Practice preventive husbandry.** Position cages to prevent the transfer of fecal matter, feathers, food, and other materials from one cage to another. Do not stack cages and be sure to use solid-sided cages or barriers if cages are adjoining. The bottom of the cage should be made of a wire mesh. Substrate/litter that will not produce dust (e.g., newspapers) should be placed underneath the mesh. Clean all cages, food bowls, and water bowls daily. Soiled bowls should be emptied, cleaned with soap and water, rinsed, placed in a disinfectant solution, and rinsed again before reuse. Between occupancies by different birds, cages should be thoroughly scrubbed with soap and water, disinfected, and rinsed in clean running water. Exhaust ventilation should be sufficient to prevent accumulation of aerosols and prevent cross contamination of rooms.
- **Control the spread of infection.** Isolate birds requiring treatment. Rooms and cages where infected birds were housed should be cleaned immediately and disinfected thoroughly. Workers should wear appropriate protective clothing. When the cage is being cleaned, transfer the bird to a clean cage. Thoroughly scrub the soiled cage with a detergent to remove all fecal debris, rinse the cage, disinfect it (most disinfectants require 5-10 minutes of contact time) and rerinse the cage to remove the disinfectant. Discard all items that cannot be adequately disinfected (e.g., wooden perches, ropes, nest material, substrate/litter). Minimize the circulation of feathers and dust by wet-mopping the floor frequently with disinfectants and preventing air currents and drafts within the area. Reduce contamination from dust by spraying the floor with a disinfectant or water before sweeping it. A vacuum cleaner or pressure washer may aerosolize infectious particles and should be used with caution. Frequently remove waste material from the cage (after moistening the material), and burn or double-bag the waste for disposal. Care for healthy birds before handling isolated or sick birds. There is no documented transmission of *C. psittaci* via ventilation systems from pet bird aviaries or pet stores to humans, nor are there any studies specific for *C. psittaci* viability in these systems. Properly maintained ventilation systems are at low risk of harboring *C. psittaci*.[13] Theoretically, desiccation from forced air movement may reduce viability of the organism. Use of a high efficiency particulate air (HEPA) filter on air system return may be an option to reduce particulate matter in the air.
- **Use disinfection measures.** All surfaces should be thoroughly cleaned of organic debris before disinfection**.** *C. psittaci* is susceptible to many disinfectants and detergents as well as heat; however, it is resistant to acid and alkali. Examples of effective disinfectants include 1:1,000 dilution of quaternary ammonium compounds (e.g., Roccal®, Zephiran®), 1% Lysol® or freshly prepared 1:32 dilution of household bleach (½ cup/gallon). Many disinfectants are respiratory irritants for both humans and birds and should be used in a well-ventilated area. Avoid mixing disinfectants with any other product.

Recommendations for Treating and Caring for Infected and Exposed Birds

All birds with confirmed or probable avian chlamydiosis should be isolated and treated, preferably under the supervision of a veterinarian (Appendix 2).

Responsibilities of bird owners, physicians, and veterinarians

Humans exposed to birds with avian chlamydiosis should seek medical attention if they develop influenza-like symptoms or other respiratory tract illnesses. The physician should consider psittacosis in ill patients exposed to birds and collect specimens for laboratory analysis if indicated. Psittacosis in humans is a Nationally Notifiable Disease[14] and most states require physicians to report cases of psittacosis to the

appropriate state or local public health authorities. Early and specific treatment for psittacosis should be initiated. Timely diagnosis and reporting can help identify the source of infection and control the spread of disease. Local and state public and/or animal health authorities may conduct epidemiologic investigations and institute additional disease control measures. Birds that are suspected sources of human infection should be referred to veterinarians for evaluation and treatment.

Veterinarians should consider a diagnosis of avian chlamydiosis for any lethargic bird that has nonspecific signs of illness, especially if the bird was recently purchased. If avian chlamydiosis is suspected, the veterinarian should submit appropriate laboratory specimens to confirm the diagnosis. Laboratories and attending veterinarians should follow local and state regulations or guidelines regarding case reporting. Veterinarians should work closely with authorities on investigations and inform clients that infected birds should be isolated and treated. In addition, they should educate clients about the public health hazard posed by *C. psittaci* and the appropriate precautions that should be taken to avoid the risk for transmission.

Local and state epidemiologic investigations

Local health authorities should report suspected cases to their state health department.[15] Public health and animal health authorities at the local or state level may need to conduct cooperative epidemiologic investigations to control the transmission of *C psittaci* among humans and birds. An epidemiologic investigation should be initiated if a bird with confirmed or probable avian chlamydiosis was either:

- procured from a pet store, breeder, or dealer within 60 days of the onset of signs of illness;
- linked to a person with confirmed or probable psittacosis; or
- associated with several other suspect avian cases from the same source.

Other situations can be investigated at the discretion of the appropriate local or state public health department or animal health authorities.

Investigations involving recently purchased birds should include a visit to the site where the infected bird is located and identification of the location where the bird was originally procured (e.g., pet shop, dealer, breeder, or quarantine station). Authorities should document the number and types of birds involved, the health status of potentially affected persons and birds, locations of facilities where birds were housed, relevant ventilation-related factors and any treatment protocol.[16] Suspect birds should be tested as recommended (Appendix 1). Examination of sales records for follow up of other birds that had contact with the infected bird may be considered.

Quarantine of birds

Depending on the state's regulatory authority, animal or public health officials may issue a quarantine for all affected and exposed birds on premises where *C. psittaci* infection has been identified. The purpose of imposing a quarantine is to prevent further pathogen transmission. Reasonable options should be made available to the owners and operators of pet stores. Preferably, the owner of quarantined birds should treat the birds in a separate quarantine area to prevent exposure to the public and other birds. Alternatively, and with the approval of authorities, the owner can sell the birds after at least 7 days of treatment, provided that the new owner agrees in writing to continue the quarantine and treatment and is informed of the disease hazards. After completion of the treatment or removal of the birds, quarantine can be lifted after the premises are thoroughly cleaned and disinfected. Environmental testing can be valuable in evaluating the effectiveness of cleaning and disinfection. The area can then be restocked with birds.

Bird importation regulations

Large-scale commercial importation of psittacine birds from foreign countries ended in 1993 with the implementation of the Wild Bird Conservation Act.[17] Limited importation of personal pets and avicultural specimens is permitted at this time. Illegally imported (smuggled) birds are a potential source of *C. psittaci* infection to domestic birds and people. The United States Department of Agriculture, Animal Plant Health and Inspection Service, Veterinary Services still regulates the legal importation of pet birds to ensure that exotic poultry diseases are not introduced into the United States.[18] These regulations are set forth in the Code of Federal Regulations, Title 9, Chapter 1. Current minimum treatment protocols under these regulations are not always sufficient to resolve infection in all birds.

Appendix 1

TESTING METHODS FOR *C. PSITTACI* IN BIRDS

Bacteria are classified as *Chlamydophila psittaci* on the basis of shared biochemical characteristics and genome composition. The individual chlamydial organisms that meet these classification criteria are not identical and represent life forms that have evolved, and continue to evolve, through infection of both ancient and naïve hosts. Diversity in the organism, the level of exposure, and the host response may cause spurious test results in some individual animals.

Diagnosis of avian chlamydiosis can be difficult, especially in the absence of clinical signs. A single testing method might not be adequate. Therefore, use of a combination of culture, antibody-detection and antigen-detection methods is recommended, particularly when only one bird is tested. Although there is no epidemiologic evidence of increased risk to young, elderly, or immunocompromised humans, more rigorous testing should be considered for birds in contact with these individuals. Consultation with an experienced avian veterinarian may help when selecting tests and interpreting results. Because proper sample collection techniques and handling are critical for obtaining accurate test results, clinical laboratories should be contacted for specifics on specimen submission.

Pathologic diagnosis

In birds with avian chlamydiosis, cloudy air sacs and enlargement of the liver and spleen may be observed, but no specific gross lesion is pathognomonic. Chromatic or immunologic staining of tissue or impression smears can be used to identify organisms in necropsy and biopsy specimens.

Bacteriologic culture

Use of culture is recommended to avoid limitations associated with other tests. Tissue specimens from the liver and spleen are the preferred necropsy specimens. In live birds, combined conjunctival, choanal and cloacal swab specimens or liver biopsy specimens are ideal for diagnosis. Live birds being screened for *C psittaci* might not shed the microorganism daily. Therefore, to optimize recovery, serial fecal specimens should be collected for 3 to 5 consecutive days and pooled for submission as a single sample.

Chlamydophila species are obligate intracellular bacteria that must be isolated in tissue culture or embryonating chicken eggs. Specialized laboratory facilities and training are necessary for reliable identification of chlamydial isolates and adequate protection of microbiologists. The diagnostic laboratory should be contacted for specific procedures required for collection and submission of specimens. The proper handling of specimens is critical for maintaining the viability of organisms for culture, and a special transport medium is required. Following collection, specimens should be refrigerated and sent to the laboratory packed in ice but not frozen.

Tests for antibodies

A positive serologic test result is evidence that the bird was infected by *Chlamydiaceae* at some point, but it might not indicate that the bird has an active infection. False-negative results can occur in birds that have acute infection when specimens are collected before seroconversion. Treatment with an antimicrobial agent can diminish the antibody response. However, IgG titers may persist following successful treatment.

When specimens are obtained from a single bird, serologic testing is most useful when signs of disease and the history of the flock or aviary are considered and serologic results are compared with white blood cell counts and serum activities of liver enzymes. A >4-fold increase in the titer of paired samples or a combination of a titer and antigen identification is needed to confirm a diagnosis of avian chlamydiosis.

- **Elementary-body agglutination (EBA)** - The elementary body is the infectious form of *C psittaci*. Elementary-body agglutination is commercially available and detects IgM antibodies, an indicator of early infection. Titers >10 in budgerigars, cockatiels, and lovebirds and titers >20 in larger birds are frequently detected in cases of recent infection. However, increased titers can persist after treatment is completed.

- **Indirect Fluorescent Antibody Test (IFA) -** Polyclonal secondary antibody is used to detect host antibodies (primarily IgG). Sensitivity and specificity varies with the immunoreactivity of the polyclonal antibody to various avian species. Low titers may occur because of non-specific reactivity.

- **Complement fixation (CF**) - Direct CF is more sensitive than agglutination methods. False-negative results are possible in specimens from parakeets, young African gray parrots, and lovebirds. High titers can persist after treatment and complicate interpretation of subsequent tests. Modified direct CF is more sensitive than direct CF.

Tests for antigen

Tests for antigen detect the organism. These tests give rapid results and do not require live, viable organisms; however, false-positive results from cross-reacting antigens can occur. False-negative results can occur if there is insufficient antigen or if shedding is intermittent. As with all nonculture tests, results must be evaluated in conjunction with clinical findings.

- **Enzyme-Linked Immunosorbent Assay** (**ELISA) -** ELISA tests were originally developed for identification of *Chlamydia trachomatis* in humans. The exact sensitivity and specificity of these tests for identifying other *Chlamydiaceae* are not known. They are now occasionally used to identify suspected *C. psittaci* in birds. If a bird has a positive ELISA result but is healthy, the veterinarian should attempt to verify that the bird is shedding antigen via isolation of the organism. When a clinically ill bird has a negative ELISA result, a diagnosis of avian chlamydiosis cannot be excluded without further testing (e.g., culture, serologic testing or polymerase chain reaction [PCR] assay).

- **Fluorescent Antibody Test (FA) -** Monoclonal or polyclonal antibodies, fluorescein staining techniques and fluorescent microscopy are used to identify the organism in impression smears or other specimens. These tests have similar advantages and disadvantages to ELISA. This test is utilized by some state diagnostic laboratories.

Tests for DNA

Numerous laboratories offer diagnostic testing using polymerase chain reaction assay (PCR). PCR amplification can be sensitive and specific for detection of target DNA sequences in collected specimens (e.g., combined conjunctival, choanal and cloacal swab specimens and blood). Results differ between laboratories because there are no standardized PCR primers and laboratory techniques and sample handling may vary. Because of the sensitivity of the assay, samples for PCR must be collected using techniques to avoid contamination from the environment or other birds. PCR does not differentiate between viable and nonviable microorganisms. Test results must be interpreted in light of clinical presentation and other laboratory tests.

Additional tests

Additional diagnostic techniques are in use or under development. Readers are encouraged to research peer-reviewed reports on such tests before use.

Laboratories that test avian specimens for *C psittaci*

Table 2 lists government and university laboratories that perform chlamydial diagnostic tests. There are numerous private laboratories that provide similar services. Inclusion in Table 2 does not imply endorsement by the National Association of State Public Health Veterinarians or constituent institutions.

Table 2: Laboratories that test avian specimens for Chlamydiaceae

Laboratory	Tests Performed*	Telephone Number Website
Diagnostic Center for Population and Animal Health, Michigan State University, East Lansing, MI	Culture, PCR	(517) 353-2296 www.dcpah.msu.edu
Comparative Pathology Laboratory, University of Miami, Miami, FL	ELISA (antigen), IFA PCR	(305)585-6303 www.pathology.med.miami.edu
Infectious Diseases Laboratory (IDL), University of Georgia College of Veterinary Medicine, Athens, GA	Culture PCR, IFA	(305) 585-6303 www.vet.uga.edu/sams/idl
Veterinary Medical Diagnostic Laboratory (VMDL) College Station, TX	Culture, PCR, DCF	(979) 845-3414 http://tvmdlweb.tamu.edu/
Diagnostic Virology Lab, National Veterinary Service Laboratory (NVSL), VS, APHIS,USDA, Ames IA**	CF, Culture	(515) 663-7551 http://www.aphis.usda.gov/animal_health/lab_info_services/about_dvl.shtml

*CF = Complement fixation, EBA = Elementary body agglutination, ELISA= Enzyme-linked immunosorbent assay, IFA = Immunofluorescent antibody, PCR =Polymerase chain reaction assay, DCF – Direct compliment fixation, DCF = Direct florescent antibody

**NVSL is a USDA reference laboratory and samples must be submitted through State Veterinary Diagnostic Laboratories

Appendix 2

TREATMENT OPTIONS FOR BIRDS WITH AVIAN CHLAMYDIOSIS

Routine prophylactic antibiotic treatment is highly discouraged as it may cause adverse affects and could generate resistant strains of *C. psittaci* and other bacteria

Treatment of avian chlamydiosis can be difficult. Although treatment protocols are usually successful, knowledge is evolving and no protocol ensures safe treatment or complete elimination of infection in every bird. Therefore, treatment for avian chlamydiosis should be supervised by a licensed veterinarian after consultation with an experienced avian veterinarian.

General Recommendations for Treating and Caring for Infected and Exposed Birds

- The recommended treatment period for avian chlamydiosis has historically been 45 days, except in budgerigars where 30 days of treatment can be effective.
- Avian facility managers should provide employees with simple, concise written treatment procedures to assure treatment success.
- Sick birds may consume inadequate amounts of medicated food or water, so they should be initially treated with drugs delivered directly by mouth or injection.
- Protect birds from undue stress (e.g., chilling, relocation), poor husbandry, and malnutrition. These problems reduce the effectiveness of treatment and promote the development of secondary infections with other bacteria or yeast.
- Observe the birds daily, and weigh them every 3 to 7 days. If the birds are not maintaining weight, have them reevaluated by a veterinarian.
- Remove oyster shell, mineral blocks, and cuttlebone during treatment. High dietary concentrations of calcium and other minerals inhibit the absorption of tetracyclines. In hand-fed neonates where dietary calcium is required, the calcium and tetracycline should be given at least 4 to 6 hours apart
- Isolate birds that are to be treated in clean and uncrowded cages.
- Good husbandry practices should be followed to prevent opportunistic infections:
    - clean up all spilled food promptly
    - wash food and water containers daily.
    - provide appropriate vitamins daily.
- Continue medication for the full treatment period to avoid incomplete resolution of the infection.
- Birds may have reduced chlamydial shedding within days of treatment initiation.
- Treated birds can be reinfected; therefore contaminated aviaries should have a final thorough cleaning and disinfection several days before treatment ends.
- Post-treatment testing should be conducted no sooner than two weeks after treatment is completed.

Treatment Using Doxycycline

Doxycycline is presently the drug of choice for treating birds with avian chlamydiosis. It is better absorbed and more slowly eliminated than other tetracyclines. This allows doxycycline to be effective with lower drug doses (improving palatability with food or water-based administration) or administered less frequently (improving ease of treatment). Treated birds should be monitored for signs of doxycycline toxicosis. Toxicosis can cause general signs of illness (signs of depression, inactivity and decreased appetite), green- or yellow-stained urine and altered results of hepatic tests (high serum activities of aspartate aminotransferase and lactate dehydrogenase and high serum concentration of bile acids). If toxicosis occurs, administration should be stopped and supportive care provided until the bird recovers. Treatment with a different regimen or lower doxycycline dose can be started at a later date. Below are several options for treatment. Options should not be combined in the same day.

- **Doxycycline medicated feed for budgerigars and cockatiels**—It is critical to use the recommended doxycycline formulation and dietary ingredients to achieve safe and effective results. The following medicated diet[19] can be used to treat avian chlamydiosis:

    1. Mix 1 part cracked steel-cut oats with 3 parts hulled millet (measured by volume).
    2. To each kilogram of oat-seed mixture, add 5 to 6 mL of sunflower oil. Mix thoroughly to coat all seeds.
    3. Add 300 mg of doxycycline hyclate (from capsules) per kilogram of oat-seed-oil mixture, and mix thoroughly to ensure that oats and seeds are evenly coated.

    Prepare fresh medicated oat-seed-oil mixture daily because doxycycline stability in this diet is unknown. Feed as the sole diet. The oats and hulled millet seed are available at health food stores. Small-sized millet should be selected. Sunflower oil is available in grocery stores. Doxycycline hyclate capsules are available in 50- and 100-mg sizes.

- **Doxycycline medicated water**—Results of pharmacologic studies indicate that doses of 200 to 400 mg of doxycycline hyclate/L of water for cockatiels, 400 to 600 mg/L for Goffin's cockatoos, and 800 mg/L for African gray parrots will maintain therapeutic concentrations.[20,21] Research data are lacking for other species, but empiric use of 400 mg/L of water has been successful for many psittacine birds. Medicated water should be prepared daily and provided in clean bowls, rather than water bottles. Do not use medicated water for budgerigars as it will not maintain therapeutic concentrations.[16]

- **Orally administered doxycycline**—Doxycycline is the drug of choice for oral administration; either the monohydrate or calcium-syrup formulations can be used. Dosage recommendations are as follows: 25 to 35 mg/kg every 24 hours for cockatiels, 25-50 mg/kg for Senegal parrots, blue-fronted and orange-winged Amazon parrots; and 25 mg/kg every 24 hours for African gray parrots, Goffin's cockatoos, blue and gold macaws and green-winged macaws. Precise dosages cannot be extrapolated for other species; however, 25 to 30 mg/kg every 24 hours is the recommended starting dosage for cockatoos and macaws, and 25 to 50 mg/kg every 24 hours is recommended for other psittacine species. If the bird regurgitates or refuses the drug, another treatment method should be used.

- **Injectable doxycycline**— The only suitable doxycycline formulation for intramuscular injection is Vibramycin SF IV[a] (Vibrovenos®), [a] a specific European formulation that can be imported into the U.S. (Table 3). It is effective if administered at doses of 75 to 100 mg/kg, IM, every 5 to 7 days for the first 4 weeks and subsequently every 5 days for the duration of treatment. This formulation can cause irritation at the injection site, but it is usually tolerated. Other injectable doxycycline hyclate formulations may cause severe tissue reactions if given IM.

Alternative treatment regimens

- **Injectable Oxytetracycline** - Limited information exists to guide the use of an injectable, long-acting oxytetracycline product LA-200.[b] Current dosage recommendations are as follows: SC injection of 75 mg/kg every 3 days in Goffin's cockatoos, blue-fronted and orange-winged Amazon parrots, and blue and gold macaws. [22] This dosage might be suitable for other species but has not been tested. This product causes irritation at the site of injection and is best used to initiate treatment in ill birds or those that are reluctant to eat. After stabilization with oxytetracycline treatment, the birds should receive another form of treatment to reduce the irritation that is caused by repeated oxytetracycline injection.

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a. Pfizer Laboratories, London, England
b. Pfizer Laboratories, Exton, Penn.

- **Chlortetracycline (CTC) Medicated Feed** - Chlortetracycline medicated feed has historically been used for flock treatment, however doxycycline regimens are preferred. If used, CTC medicated feed should be the only food provided to the birds during the entire treatment. Birds' acceptance of medicated feed is variable. Thus, food consumption should be monitored. Acceptance can be enhanced by first adapting the birds to a similar, nonmedicated diet. Treatment begins when the birds accept the medicated feed as the sole food in their diet. The following options are available:
  - Medicated mash diets (i.e., >1% CTC with <0.7% calcium) prepared with corn, rice, and hen's scratch.[23]
  - Pellets and extruded products containing 1% CTC can be used. They are available and appropriate for use with pet birds. Select a pellet size appropriate for the size of bird being treated.[24, 25]
  - A special diet might be necessary for lories and lorikeets, which feed on nectar and fruit in the wild.[26]

Treatment Methods Not Recommended

Use of water medicated with chlortetracycline (Aureomycin), oxytetracycline (Terramycin) or other tetracycline products (except doxycycline) is not recommended. These products may reduce water consumption, are not likely to be effective and may interfere with disease testing.

Sources of Medications

The following sources (Table 3) are not listed as an endorsement of the companies or products. Other sources might be available.

Table 3: Sources of medication for avian chlamydiosis

Contact	Product	Telephone Number Website
	DOXYCYCLINE	
Local pharmacies	1.Docycycline hyclate capsules 50 & 100 mg 2. Doxycycline calcium oral suspension 3. Doxycycline monohydrate oral suspension 4. Vibramycin 50 & 100 mg capsules	
Dr. Gerry M. Dorrestein Wilhelminalaan 19A 5512BJ Vessem The Netherlands	Vibramycin SF I.V.*	Tel: 000 316 11057602 Fax: 000 313 02533131 dorresteingm@planet.nl
	MEDICATED FEED	
Avi-Sci Inc., St. Johns, MI	Chlortetracycline, 1%	Tel: 800.942.3438 mike@avi-sci.com
Roudybush, Paso Robles, CA	Chlortetracycline, 1%	Tel: 800.326.1726 www.roudybush.com
Ziegler Brothers Inc. Gardners, PN	Chlortetracycline, 1% (special order, 50# minimum)	Tel: 800.841.6800 www.zeiglerfeed.com
	CHLORTETRACYCLINE POWDER	
Fort Dodge Animal Health Fort Dodge, IA	Aureomycin, (chlortetracycline hydrochloride) soluble powder concentrate, 4 oz packets	Tel: 800.685.5656 fdorder@FDAH.com
Phibro Animal Health Fairfield, NJ	CLTC 100 (Chlortetracycline hydrochloride), 22% (100 gm/lb)	Tel: 888.403.0074 www.phibroah.com
Agrilaboratories Inc. St. Joseph, MO	CTC (Chlortetracycline hydrochloride), soluble powder, 25.6 oz. packet (102 g CTC)	Tel: 800.542.8916 www.agrilabs.com
	TETRACYCLINE POWDER	
Agrilaboratories Inc. St. Joseph, MO	Tetra – bac 324 (Tetracycline hydrochloride), soluble powder, 324 g/lb concentration	Tel: 800.542.8916 www.agrilabs.com
	OXYTETRACYCLINE POWDER	
Agrilaboratories Inc. St. Joseph, MO	Agrimycin – 343 (Oxytetracycline hydrochloride), soluble powder, 343 g/lb concentration	Tel: 800.542.8916 www.agrilabs.com

*Investigational New Animal Drug Application (INADA) is no longer required, Contact the FDA at (301) 594-0796 about obtaining a personal import letter.

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[14] CDC Nationally Notifiable Infectious Diseases, U.S. http://www.cdc.gov/ncphi/disss/nndss/phs/infdis2009.htm

[15] Sample Human Psittacosis Case Report http://www.nasphv.org/documentsCompendia.html

[16] Sample Avian Chlamydiosis Case Report; http://www.nasphv.org/documentsCompendia.html

[17] Wild Bird Conservation Act of 1992, Title I of PL 102–440. 16 US Code 4901–4916. Available at: http://international.fws.gov/permits/web%20list%20wbca.htm.

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Additional Resources

General Public (Fact Sheets)

Medline Medical Encyclopedia: Psittacosis; US National Library of Medicine and National Institute of Health
http://www.nlm.nih.gov/medlineplus/ency/article/000088.htm

Psittacosis, Technical Information; Center for Disease Control and Prevention
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/psittacosis_t.htm

Psittacosis in Birds and People Public Health Fact Sheet; Massachusetts Department of Public Health
http://www.mass.gov/Eeohhs2/docs/dph/cdc/factsheets/psittacosis_birds_people.pdf

Psittacosis Fact Sheet: Public Health: Seattle and King Counties
http://www.kingcounty.gov/healthservices/health/communicable/diseases/psittacosis.aspx

Medical and Public Health Professionals

Ohio Dept. of Health Infectious Disease Control Manual http://www.odh.ohio.gov/pdf/IDCM/psitta.pdf

Psittacosis Control Guidelines for Local Health Departments; Virginia Dept of Health
http://www.vdh.virginia.gov/epidemiology/DEE/otherzoonosis/documents/Psittacosis/Psittacosis%20for%20LHD%20revApr06%20e.pdf

WebMD's "emedicine" site http://www.emedicine.com/med/topic1951.htm

Occupational Health and Safety
Hazard Information Bulletin on psittacosis; Occupational Safety and Health Association
http://www.osha.gov/dts/hib/hib_data/hib19940808.html

Safety Services; Occupational Health; Animal Care and Use Occupational Health Program, University of California, Davis http://safetyservices.ucdavis.edu/occupational-health-services/acu/educational-materials/psittacosis/?searchterm=psittacosis
Psittacosis: Bioterrorism Agent Profiles for Health Care Workers; Arizona Department of Health http://www.azdhs.gov/phs/edc/edrp/es/pdf/psittacosisset.pdf

Psittacosis; Canadian Center for Occupational Health and Safety http://www.ccohs.ca/oshanswers/diseases/psittacosis.html

Veterinarians and Animal Professionals

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Manual of Diagnostic Tests and Vaccines for Terrestrial Mammals; World Organization of Animal Health or OIE http://www.oie.int/eng/normes/mmanual/A_00105.htm

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Psittacosis; Center for Food Security and Public Health, Iowa State University http://www.cfsph.iastate.edu/Factsheets/pdfs/psittacosis.pdf

Psittacosis; State of New Jersey Department Of Agriculture http://www.state.nj.us/agriculture/divisions/ah/diseases/psittacosis.html

Schaffner W. Birds of a feather—do they flock together? *Infect Control Hosp Epidemiol* 1997; 18:162–164.

Psittacosis

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Chlamydia psittaci***

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Chlamydia psittaci***

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Chlamydia psittaci***

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms

Chest Pain	☐ Yes	☐ No ☐ Unk	Muscle pain	☐ Yes	☐ No ☐ Unk
Chills	☐ Yes	☐ No ☐ Unk	Myocarditis	☐ Yes	☐ No ☐ Unk
Cough	☐ Yes	☐ No ☐ Unk	Rash	☐ Yes	☐ No ☐ Unk
Encephalitis	☐ Yes	☐ No ☐ Unk	Thrombophlebitis	☐ Yes	☐ No ☐ Unk
Headache	☐ Yes	☐ No ☐ Unk			

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic: _____

Date started: / /

Dose: _____

Unit: ☐ mg ☐ ml ☐ IU # of days: _____

Number of times a day: _____

Route: _____

Antibiotic: _____

Date started: / /

Dose: _____

Unit: ☐ mg ☐ ml ☐ IU # of days: _____

Number of times a day: _____

Route: _____

Antibiotic: _____

Date started: / /

Dose: _____

Unit: ☐ mg ☐ ml ☐ IU # of days: _____

Number of times a day: _____

Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.

EXPOSURE PERIOD — Onset — COMMUNICABLE PERIOD

The incubation period for **psittacosis** is 5 to 19 days.

Psittacosis is rarely communicable person to person. Laboratory infections can occur.

RISK FACTORS/TRAVEL

In the 4 weeks prior to the onset of symptoms, did the case:

Have contact with birds or contaminated environments:

Duck	☐ Yes	☐ No	☐ Unk	Parakeet	☐ Yes	☐ No	☐ Unk	Turkey	☐ Yes	☐ No	☐ Unk
Goose	☐ Yes	☐ No	☐ Unk	Parrot	☐ Yes	☐ No	☐ Unk				
Love bird	☐ Yes	☐ No	☐ Unk	Pigeon	☐ Yes	☐ No	☐ Unk	Other bird:			

Which bird:		**Which bird:**		**Which bird:**	
Contact date:	/ /	**Contact date:**	/ /	**Contact date:**	/ /
Location name:		Location name:		Location name:	
Address:		Address:		Address:	
City:		City:		City:	
State/Zip:		State/Zip:		State/Zip:	
Phone:	( )- -	Phone:	( )- -	Phone:	( )- -

CONTACTS

Contacts with the same exposures? ☐ Yes ☐ No ☐ Unknown

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Diseases Q-R

RABIES (Human and Animal)

Report human cases immediately

Also known as: Hydrophobia and Lyssa

Responsibilities:
Hospital: Report human cases immediately by phone
Infection Preventionist: Assess in-house exposures to hospitalized human cases
Lab: Report all human cases immediately by phone, animal positive cases report by phone or mail
Physician: Report human cases immediately by phone
Local Public Health Agency (LPHA): Assess case exposures and other potential human exposures

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

The virus that causes rabies is a rhabdovirus of the genus *Lyssavirus.*

B. Clinical Description

Animal Rabies

Rabies is primarily a disease of the central nervous system. Animals with rabies can appear normal, meek ("dumb rabies"), or may be aggressive ("furious rabies"). Animals with furious rabies often exhibit aggressive or unusually excited behavior; they may excessively salivate and attack other animals or humans. Dumb rabies may be more difficult to detect; animals may seem tame, wounded, or dazed. These animals have been described as acting disoriented or suffering from some paralysis. While these behaviors are commonly reported, an animal's behavior is *not* a reliable indicator of whether it has rabies.

Human Rabies

Rabies is a fatal infection, which usually progresses over 2 – 21 days. A prodromal phase, lasting 2 – 10 days, is characterized by pain and numbness/tingling at the site of the bite (present in 50% – 80% of cases), and nonspecific complaints such as fatigue, headache and fever. Behavioral changes may also be apparent, including apprehension, anxiety, agitation, irritability, insomnia and depression. The prodromal phase is quickly followed by the neurologic phase, during which the patient may suffer disorientation and hallucinations; paralysis; episodes of terror and excitement; hydrophobia; hyperventilation; hypersalivation; and seizures. These symptoms are invariably followed by coma and death. Once symptoms have begun, there is usually no treatment or cure; prevention is the only tool.

Rabies should be considered in patients with signs or symptoms of encephalitis or myelitis, including autonomic instability, dysphagia, hydrophobia, paresis, and paresthesia, particularly if a nonspecific prodrome preceded the onset of these signs by three to four days. Progressive worsening of neurologic signs is characteristic of rabies and should be considered as a positive indicator for rabies. Laboratory tests to rule out common encephalitides (herpes, enteroviruses, arboviruses) should be performed. Negative results of these tests would increase the likelihood of rabies as the diagnosis. If

a patient presents with symptoms similar to the ones described above, but the neurologic status does not change and the illness continues for longer than three weeks, rabies is unlikely as the diagnosis.

Positive Indicators for Rabies

Nonspecific prodrome prior to onset of neurologic signs
Neurologic signs consistent with encephalitis or myelitis
- dysphagia
- hydrophobia
- paresis

Progression of neurologic signs
Negative test results for other etiologies of encephalitis

Negative Indicators for Rabies

Improvement or no change in neurologic status
Illness with ≥ 2 to 3 week duration

C. Reservoirs

All species of mammals are susceptible to rabies infection. During 2009, a total of 35 cases of animal rabies were reported in Iowa. Twenty-five reported animal cases were wildlife species: 13 skunks, 11 bats and 1 squirrel. In addition, 5 cows, 3 cats, and 2 dogs tested positive for rabies. This data reflects only the tested animals that might have exposed humans or other domestic animals to rabies, and does not represent all rabid animals in Iowa. See www.idph.state.ia.us/Rabies/Resources.aspx for more information.

D. Modes of Transmission

Rabies is spread via the virus-laden saliva of an infected animal through a bite or saliva contact with mucous membranes or a fresh break in the skin. Breaks in the skin or mucous membrane exposure to nervous tissue (brain, spinal cord) of an infected animal also pose a transmission threat. Bites of some animals, such as bats, can inflict injury so minor that it goes undetected. Airborne spread (for example, in a cave with many bats, or in a laboratory through rabies virus or specimens) is rare, but has been reported. Rabies is not transmitted through contact with blood, urine, skunk spray, or feces of an infected animal.

Person-to-person spread has been documented after organs and corneas were transplanted from rabies infected individuals. Two non-laboratory-confirmed cases of person-to-person rabies transmission in Ethiopia have been described; the reported route of exposure in both cases was direct saliva contact (a bite and a kiss).

E. Incubation period

Animal Rabies

Depending on the animal, the incubation period may vary from a few weeks to a few years, but is typically 1 - 3 months.

Human Rabies

The incubation period is usually 3 - 8 weeks, but can rarely range from as few as 9 days (although 9-day incubation periods have not been documented in the U.S. with native strains of rabies) to as many as 7 years. Less than 1% of human cases have an incubation period longer than 6 months. The incubation period is typically related to the site of exposure; *e.g.,* the incubation period is usually shorter if the virus is inoculated closer to the central nervous system or in a highly innervated area. The incubation period also typically depends on exposure severity (more virus exposure results in a shorter incubation period) and the age of the exposed person (younger age generally results in a shorter incubation period).

F. Period of Communicability or Infectious Period

Animal Rabies

Animals are not infectious until virus is present in their saliva, which happens around the time of clinical onset of illness. Dogs, cats and ferrets may shed virus in their saliva for 3 – 7 days before the onset of clinical signs, and continue to shed virus until death. The shedding/communicability period for most wild animals has not been determined, although it appears that skunks may shed virus up to 18 days before death. Carcasses of animals with rabies may contain infectious virus, depending on temperature and environmental conditions. Rabies virus may persist in a frozen carcass for many weeks; however drying and sunlight rapidly deactivate rabies virus. A dried carcass or dried saliva does not contain live rabies virus.

Human Rabies

The period during which a patient is potentially infectious may begin up to 1 week before symptom onset and last until death. Saliva is considered potentially infectious, as are cerebrospinal fluid and organs (although viral concentrations in humans are 3 – 4 times lower than in dogs).

G. Epidemiology

Animal rabies

Animal rabies exists in most parts of the world. In the United States, Hawaii is the only state that has never reported an indigenously-acquired rabies case in humans or animals. In 2010, wild animals accounted for approximately 92% of reported cases of animal rabies in the U.S. Nationally, raccoons continue to be the most frequently reported rabid wildlife species (36.5% of all animal cases in 2010), followed by skunks (23.5%), bats (23.2%), foxes (6.6%), and other wild animals including rodents and lagomorphs (1.9%).

In the U.S., domestic species accounted for 8% of all rabid animals reported in 2010. The number of reported rabid domestic animals increased among cats and decreased among dogs, horses, sheep, and goats during 2010. In 2010, cases of rabies in cats increased 1.0% compared with the number reported in 2009. The number of rabies cases reported in cats is routinely 3-4 times that of rabies reported in cattle or dogs. In 2010 approximately 1.1% of cats and 0.3% of dogs tested for rabies were found positive.

Human Rabies

Worldwide an estimated 35,000–40,000 human rabies deaths occur each year. The vast majority of these deaths occur in developing countries. In the United States from 1995 through 2008, there were 49 human cases, of which 48 were fatal. Four cases were the result of solid tissue organ transplantation; 30 cases were associated with bat variants; one was associated with the raccoon variant; one was associated with the fox variant; and eight were associated with the canine variant. The most recent human cases of rabies in Iowa occurred in 1951 and 2002. The 2002 case was caused by the bat strain of rabies virus.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To understand the rabies risk to people bitten or exposed to animal saliva or infectious materials
- To provide information on proper post exposure treatment for humans exposed

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report human rabies immediately, and animal rabies within 3 days to IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Reporting forms are available free of charge from the clearinghouse.
Call ((319) 398-5133) to request a supply. Orders can also be processed online at
healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295

C. Local Public Health Agency Follow-up Responsibilities

a. **The most important thing a local county health department can do if it learns of a suspected or confirmed case of human rabies is to immediately call IDPH, any time of the day or night.** The 24-hour phone number for the Center for Acute Disease Epidemiology is (800) 362-2736.

b. Case investigation of human rabies in Iowa residents will be directed by IDPH Center for Acute Disease Epidemiology.

c. Following immediate notification of IDPH, the LPHA may be asked to assist in investigating cases living within its community, including gathering the following information:
   1) The case's name, age, address, phone number, status (hospitalized, at home, deceased), and parent/guardian information, if applicable.
   2) The name and phone number of the hospital where the case is or was hospitalized.
   3) The name and phone number of the case's attending physician.
   4) The name and phone number of the infection preventionist at the hospital.
   5) The names and phone numbers of all healthcare providers and hospitals that cared for the patient.

d. Institution of disease control measures is an integral part of case investigation. The LPHA is responsible for understanding and, if necessary, instituting the control guidelines listed in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Human Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient
Standard Precautions for the duration of illness (e.g., until death).

Minimum Period of Quarantine of Contacts
None for humans.

B. Protection of Contacts of a Case

1. Protection of Humans Exposed to Animals

Under Iowa Code Chapter 351.39, Local Boards of Health are responsible for collecting human exposure reports and enforcing animal confinement.

The need for post-exposure rabies prophylaxis should be evaluated in three steps and can be phrased in the form of three questions:
1) is the animal species known to carry rabies?
2) did an actual exposure occur? and
3) can the animal be tested?

Step 1. Is the animal species known to carry rabies?

Wild Animals:
In wild animals the rabies risk varies by species:

- High-risk animals are those that commonly carry rabies. In Iowa, these include skunks, bats, raccoons, foxes, and coyotes.
- Medium-risk animals have very rarely been found to carry rabies in the US (extremely rare in Iowa) large rodents such as beaver, muskrat, groundhog, and woodchuck.
- Low-risk animals that almost never carry rabies include small rodents, opossum, and lagomorphs. This includes mice, squirrels, chipmunks, and rabbits.

Dogs, Cats, Ferrets, Horses and Livestock:
These animals can be infected with rabies virus. Exposures to dogs, cats, horses, and livestock need to be carefully evaluated, since a potential exists for these animals to harbor the virus.

Other Species:
CADE is available for consultation call 800-362-2736 during business hours or 515-323-4360 after hours.

Once it has been determined that the animal involved is a potential carrier of rabies, the clinician should move to the second step. (Whether or not an animal has been vaccinated is immaterial to assessment because, though vaccination decreases the risk of the animal being rabid, it is not a guarantee).

Step 2. Did an exposure actually occur?
Rabies is transmitted by introducing the virus into open cuts or wounds in skin or via mucous membranes. The virus will not cross intact skin. Since the virus is present in saliva, actual exposures to the virus require bites, saliva contact to mucous membranes, or contamination of fresh, open cuts, wounds, or abrasions with saliva.

Other nonsalivary exposures to rabies virus rarely occur, and include exposure to large amounts of aerosolized rabies virus (e.g. explorers of caves colonized by rabid bats); infected organs (e.g., corneas) transplanted from patients who died of unrecognized rabies; and exposure of open wounds or mucous membranes to other potentially infectious material (nervous tissue) from a rabid animal. If the material containing the virus is dry, the virus can be considered noninfectious. Other contact, such as petting a rabid animal or contact with the blood, urine, skunk spray, or feces, does not constitute an exposure and is not an indication for prophylaxis.

Bats pose a unique problem. The bite of a bat can be so small that it may be undetected. People found in rooms with bats, who are unable to state, "I know I was not bitten," should be considered potentially exposed. For example persons that awaken to find a bat in the room or children alone with a bat in a room should be considered exposed to rabies.

Once it has been determined that a potential exposure occurred, the clinician should move to the third step. (Can the animal be tested?).

Step 3. Can the animal be tested?

Bats
If available, the bat should be tested for rabies. If the bat is unavailable for testing, PEP should be considered.

Wild Animals
High risk animals should be euthanized and submitted for rabies testing. Since viral shedding periods are not known for these animals, quarantine is not appropriate. In cases in which the animals are unavailable for testing, they should be assumed rabid.

Medium-risk animals have rarely been found to carry rabies in the US and have very rarely if ever been found to be rabid in Iowa. If the animal is available, it should be submitted for testing. If the animal is not available, the exposed person should consult with their personal physician to determine whether prophylaxis is warranted.

Lower-risk animal exposures almost never require human rabies PEP, unless the circumstances surrounding the exposure were unusual (such as an unprovoked bite by an animal acting strangely).

Dogs, Cats or Ferrets
Dogs, cats and ferrets that have bitten or otherwise exposed a human and appear healthy may be quarantined for 10 days in lieu of euthanasia and testing. If at any time during the quarantine period, a dog, cat, or ferret shows signs of rabies the animal should be immediately euthanized and tested.

Dogs, cats and ferrets that are incubating rabies will begin to exhibit signs of the disease very soon after they begin shedding virus in saliva. If an animal remains healthy during the 10-day quarantine, it could not have been shedding rabies virus in its saliva at the time of the bite or exposure. This does not guarantee that the animal is not incubating rabies; it only indicates that the animal was not infectious at the time in which the human was exposed.

A dog, cat, or ferret that is not available for observation or testing should be considered potentially rabid and post-exposure prophylaxis should be initiated. If capture of the dog, cat, or ferret is likely in the near future, prophylaxis may be delayed up to 72 hours. If the animal is not located within 72 hours PEP should be initiated.

Livestock
Recommendations for livestock that expose humans are determined on a case-by-case basis. Contact IDPH (800) 362-2736 for consultation.

Other Animal Species
For exposure to other animal species, recommendations are made on a case-by-case basis. Contact IDPH (800) 362-2736 for consultation.

Note: If a patient is bitten above the shoulder, IDPH recommends that the health care provider consider starting Post Exposure Prophylaxis immediately, as opposed to waiting and observing the animal for 10 days. The closer the point of exposure is to the brain, the shorter the distance in which the virus must travel, potentially resulting in a shorter incubation period. If the animal subsequently tests negative for rabies, or if the animal is quarantined and is healthy at the end of 10 days (quarantines can only be conducted in dogs, cats, and ferrets) Post Exposure Prophylaxis can be discontinued at that time. If Post Exposure Prophylaxis is discontinued before the series is completed and the patient is exposed again in the future, the entire Post Exposure Prophylaxis series should be administered. If the Post Exposure Prophylaxis series is completed and the patient is exposed again in the future, only two doses of rabies vaccine on days 0 and 3 should be administered.

Laboratory Submission of Animal Specimens
Rabies testing requires examination of the animal's brain, so the animal should be euthanized without damage to the head. Samples should be refrigerated prior to submission to the laboratory, and freezing should be avoided. Samples determined to be unsuitable for testing or indeterminate should be assumed positive and PEP should be administered accordingly.

There are two laboratories in Iowa that provide animal rabies testing services: State Hygienic Laboratory and Iowa State University Veterinary Diagnostic Laboratory.

State Hygienic Laboratory (SHL):

SHL is the designated state public health laboratory in Iowa. SHL receives state funding enabling them to provide free testing services for diseases of public health concern. Therefore, SHL will test

potentially rabid animals that have exposed humans free of charge. SHL does not provide testing for animal to animal exposures; therefore those samples should be submitted to Iowa State University Veterinary Diagnostic Laboratory.

Iowa State University Veterinary Diagnostic Laboratory (ISU VDL):

ISU VDL has historically provided animal rabies testing as a service to veterinarians who may be ruling out rabies as one of several differential diagnosis. However, in recent years ISU VDL has received an increasing number of requests for rabies testing of domestic, livestock, and wildlife species where the submitter is only requesting rabies testing without additional diagnostics. While ISU VDL is willing and able to provide that service to the public, healthcare, and veterinary communities, they do not receive any state or federal funding to support testing. Therefore, ISU VDL must charge for the testing to cover their operating expenses. ISU VDL will provide rabies testing for cases of animal and/or human exposure.

Specimen Submission and Transportation:

Specimen Preservation:

- If the specimen will not be submitted for testing immediately, it should be refrigerated until transported or shipped.
- **DO NOT FREEZE THE SPECIMEN**

Specimen Transport:

- **Private vehicle is the fastest and preferred way to get the specimen to the laboratory.**
  - Double bag the specimen
  - Place the specimen in a hard sided container, such as a Styrofoam cooler
  - Place ice packs around the double bagged specimen to keep it cool during transport
  - Include the appropriate Rabies Test Request Form from SHL or ISU
  - Call the appropriate laboratory before departure
- **Commercial courier service, such as FedEx, can also be used.**
  - Double bag the specimen
  - Place the double bagged specimen in a hard sided container, such as a Styrofoam cooler.
  - Place ice packs around the double bagged specimen to keep it cool -DO NOT FREEZE.
  - Place the completed Rabies Test Request Form in a separate plastic bag to prevent it from becoming wet or contaminated. Place the bagged Rabies Test Request Form in the hard sided container.
    - Firmly secure the lid of the hard sided container.
    - Package (place in a box) the hard sided container and ship.
    - Ship via **overnight courier**.

NOTE: Improper packaging and/or delayed delivery may compromise the integrity of the brain material rendering the specimen unsatisfactory for testing.

Specimen submission guidelines:

- **Large/medium animals-** If only requesting rabies testing, a veterinarian needs to remove the head and only the head should be submitted for testing*****.
- **Bats-** Try not to crush the skull of the bat. Submit the entire animal.
- **Small animals (mice, squirrels, etc):** Submitting the entire animal is preferred.

***If a veterinarian is requesting other diagnostics from ISU VDL all appropriate samples should also be included. In some cases, this may mean that the entire animal should be submitted.**

Laboratory Contact Information:

SHL:
319-335-4500 or 800-421-4692 (answered all hours)

ISU VDL:
During business hours call 515-294-1950 – after hours call 515-290-1969

2. Protection of Domestic Animals Exposed to a Rabid or Potentially Rabid Animal

Longer quarantine periods are required for domestic animals exposed to a rabid or potentially rabid animal (without human exposure). Quarantines may range from 45 days to 6 months depending on the animal's vaccination status. Euthanasia may sometimes be recommended. The latest recommendations and requirements concerning the quarantine of animals exposed to a rabid or potentially rabid animal can be obtained from the Compendium of Animal Rabies Prevention and Control, 2008 National Association of State Public Health Veterinarians, Inc. (NASPHV) www.nasphv.org/Documents/RabiesCompendium.pdf

3. Protection of Humans Exposed to a Rabid or Potentially Rabid Animal or Human

Severe Bites above the Shoulder
If a patient is bitten above the shoulder, IDPH recommends the health care provider consider starting post exposure prophylaxis immediately. The closer the point of exposure is to the brain, the shorter the distance in which the virus must travel, therefore potentially resulting in a shorter disease incubation period.

If the animal subsequently tests negative for rabies, or if the animal is quarantined and is healthy at the end of 10 days (quarantines can only be conducted in dogs, cats, and ferrets) Post Exposure Prophylaxis can be discontinued at that time. If Post Exposure Prophylaxis is discontinued before the series is completed and the patient is exposed again in the future, the entire Post Exposure Prophylaxis series should be administered. If the Post Exposure Prophylaxis series is completed and the patient is exposed again in the future, only two doses of rabies vaccine on days 0 and 3 should be administered.

Human Post Exposure Prophylaxis

- Immediately and thoroughly wash all bite wounds and scratches with soap and water. Simple wound cleaning has been shown to markedly reduce the risk of rabies.
- Tetanus prophylaxis should be considered
- Risk of bacterial infections should be assessed and addressed.

1. Treatment of persons who have **not previously received rabies vaccine or have not previously received rabies post-exposure treatment**.
    a. **Immunocompetent patients:**
        - ***Four*** 1-mL vaccine doses of HDCV or PCECV should be administered intramuscularly to previously unvaccinated persons as soon as possible after exposure on days 0, 3, 7, and 14 (day 0 is the day the post exposure prophylaxis is started).
        - One dose of rabies immunoglobulin (HRIG), 20 IU/kg, should also be administered on day 0.
            - If anatomically feasible, the full dose of HRIG should be thoroughly infiltrated in the area around the wound. The rest should be administered intramuscularly at a different site than the vaccine.
            - If HRIG is not given with the first post-exposure dose of vaccine, it must be given within eight days after the first dose of vaccine.

b. Immunocompromised patients:

- ***Five*** 1-mL vaccine doses of HDCV or PCECV should be administered intramuscularly to previously unvaccinated persons as soon as possible after exposure on days 0, 3, 7, 14, *and 28*.
- One dose of rabies immunoglobulin (HRIG), 20 IU/kg, should also be administered on day 0.
    - If anatomically feasible, the full dose of HRIG should be thoroughly infiltrated in the area around the wound. The rest should be administered intramuscularly at a different site than the vaccine.
    - If HRIG is not given with the first post-exposure dose of vaccine, it must be given within eight days after the first dose of vaccine.

How is immunocompromised defined in terms of rabies vaccination?
The decision of whether individuals are immunocompromised should be determined by a physician. However, to assist with this determination, persons with the below conditions may need to receive ***five*** doses of rabies vaccine (consult with their healthcare provider).

A. Persons with immunocompromising conditions or on specific medications (non-HIV)
    - Examples include but are not limited to:
        A. Congenital immunodeficiency
        B. Leukemia
        C. Lymphoma
        D. Generalized malignancy
        E. Therapy with alkylating agents, antimetabolites, radiation, or large amounts of corticosteroids.
        F. Antimalarial medications

B. Persons with HIV infection
    A. Both symptomatic and asymptomatic patients with HIV infection

C. Persons with conditions that cause limited immune deficits
    A. Examples include but are not limited to:
        A. Renal failure
        B. Diabetes (uncontrolled)
        C. Alcoholic cirrhosis
        D. Asplenia

When rabies pre- or postexposure prophylaxis is administered to an immunosuppressed person, one or more serum samples should be tested for rabies virus-neutralizing antibody by the RFFIT test to ensure that an acceptable antibody response has developed after completing the series.
If no acceptable antibody response is detected after the final dose in the pre- or postexposure prophylaxis series, the patient should be managed in consultation with their physician and appropriate public health officials.

2. Treatment of persons who have either received pre-exposure vaccination or have previously received rabies post-exposure treatment (according to the current protocols and with approved products, if unsure contact CADE for consultation):
    a. Two IM doses (1.0 ml each) of vaccine should be administered on days 0 and 3. Human Rabies Immune Globulin should NOT be administered.

Exposure to a Human Potentially Infected with Rabies
Standard Precautions for respiratory secretions should be in place for persons suspected or confirmed to have rabies. Articles soiled with saliva should be disinfected. Attending personnel should be protected (gloves, gowns, face protection) against any exposure to saliva. If a patient who has rabies (or is suspected of having rabies) exposes another person to saliva (through a

bite or via infectious material exposure to an open wound or mucous membrane), rabies PEP of the contact should be started. Other people from the patient's home, social, and work environment should be contacted to review their potential exposure.

4. Precautions and Contraindications to Rabies Prophylaxis

a. *Immunosuppression*. Corticosteroids, other immunosuppressive agents, or immunosuppressive illness can interfere with the development of active immunity and predispose the patient to developing rabies. Immunosuppressive agents should not be administered during post-exposure therapy, unless essential for the treatment of other conditions.

b. *Pregnancy*. Because of the potential consequences of inadequately treated rabies exposure, pregnancy is not considered a contraindication to post-exposure prophylaxis. Several studies have shown no indication of increased incidence of abortion, premature births or fetal abnormalities associated with rabies vaccination. Rabies exposure or diagnosis of rabies in the mother is not an indication for pregnancy termination.

c. *Allergies*. When a patient with a history suggesting hypersensitivity to any rabies vaccine component must be given the vaccine, antihistamines can be used; epinephrine should be readily available to counteract anaphylactic reactions, and the person should be carefully observed in a medical setting during vaccination.

C. Preventive Measures

Environmental Measures

Human rabies control relies on controlling rabies in the animal population, therefore animal quarantine regulations and vaccination laws should be enforced. Under Iowa Code Chapter 351.39, Local Boards of Health are responsible for collecting human exposure reports and enforcing animal confinement. In Iowa, all dogs over 6 months of age are required to be vaccinated against rabies. Rabies vaccination is strongly encouraged in all companion animals (including horses) and valuable livestock.

Pre-Exposure Vaccination

Pre-exposure vaccination is recommended for persons in the following categories:

- Veterinarians
- Animal handlers
- Laboratory workers who handle rabies virus
- Persons living in or visiting countries where rabies is endemic
- Others whose occupations or hobbies bring them into contact with potentially rabid animals

Pre-Exposure Vaccination Protocol:

- Three 1.0 ml injections of vaccine given intramuscularly on each of days 0, 7, and 21 **or** 28.

NOTE: Pre-exposure vaccination does **NOT** eliminate the need for prompt post-exposure prophylaxis. If persons who have completed the pre-exposure vaccination series are subsequently exposed to rabies, the following protocol should be followed (as stated on page 7):

- Two IM doses (1.0 ml each) of vaccine, on days 0 and 3. Human Rabies Immune Globulin should NOT be administered.

Monitoring Pre-Exposure Vaccination Titers:

Persons who work with live rabies virus in research laboratories or vaccine production facilities and are under continuous risk of inapparent rabies virus exposure should have their serum rabies antibody titer measured every 6 months. Acceptable antibody level is 1:5 titer by the rapid fluorescent focus inhibition test (RFFIT) technique. See page 15 for laboratories performing the serologic tests. If the antibody level is less than 1:5, booster doses of vaccines should be

administered to maintain a serum titer corresponding to at least complete neutralization at a 1:5 serum dilution by RFFIT.

Persons who frequently come in contact with potentially rabid animals, such as **veterinarians, veterinary technicians, animals control officers, or wildlife officers**, should have a serum sample tested for rabies antibody every **2 years**. If their antibody level is less than complete neutralization at a 1:5 serum dilution by the RFFIT, the person should receive a single booster dose of vaccine.

Education

Offer the following advice to the public to help prevent rabies:

- Vaccinate pets; dogs are required by law to be vaccinated. Although not required by state law, cat, ferret, horse and valuable livestock vaccinations are recommended.
- Do not feed or handle wild or stray animals. Avoid sick animals or those that act strangely.
- Do not touch or handle dead animals.
- Contact local animal control officer with questions about the capture of an animal or handling of a carcass.
- Cover garbage cans and keep pet food indoors, so wild animals are not attracted.
- Do not keep wild animals as pets, which is often illegal as well as dangerous.
- Never handle bats. A bat bite or scratch may be small and go unnoticed. People who awaken to find a bat in the room or children awake or asleep with a bat in a room may require PEP.
- Recommend that travelers to developing countries with endemic rabies receive pre-exposure prophylaxis if they will be visiting in situations where exposure is likely (e.g., camping, hiking, backpacking, or away from areas where treatment for a bite wound is available). Travelers should be warned to avoid petting or otherwise having contact with stray animals.

Note: For more information about international travel and rabies, contact the CDC Traveler's Health Office at (877) 394-8747 or via the internet at www.cdc.gov/travel

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Rabies can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Programs for Uninsured and Underinsured Patients

Patient assistance programs that provide medications to uninsured or underinsured patients are available for rabies vaccine and Immune globulin.

Sanofi Pasteur's Patient Assistance Program (providing Imogam ® Rabies-HT and Imovax ® Rabies as well as other vaccines) is now administered through the Franklin Group. A healthcare professional or patient can either contact the Franklin Group directly, or call the customer service team (1-800-VACCINE) who will transfer them to the Franklin Group. The Franklin Group will review the application against the eligibility criteria. For more information about the program or to request an application, please contact the Sanofi Pasteur, Inc. Patient Assistance Program (Franklin Group) at 1 (866) 801-5655.

Novartis' Patient Assiatance Program for RabAvert ® is managed through RX for Hope and can be accessed at 800-244-7668. Instructions and request forms are also available at the Rx for Hope website RabAvert Patient Assistance Program.

References

CDC. Human Rabies Prevention—United States, 2008, Recommendations of the Advisory Committee on Immunization Practices (ACIP), *MMWR*. May 23, 2008; 57:RR-03.

Heymann D., ed. *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC: American Public Health Association, 2008.
Compendium of Animal Rabies Control, *MMWR,* April 18, 2008; 57:RR02

Additional Resources

- Iowa Department of Public Health – Rabies Resources: www.idph.state.ia.us/Rabies/
- CDC Resources: www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm
  www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm?s_cid=rr57e507_e%0d%0a
- Compendium for animal rabies control: www.nasphv.org/Documents/RabiesCompendium.pdf

CONSULTANTS: Iowa Department of Public Health
During regular business hours call: (800) 362-2736
After hours call: (515) 323-4360

LABORATORIES:

University of Iowa State Hygienic Laboratory (SHL)
Oakdale Campus
University of Iowa
Iowa City, IA 52242
Tel: (319) 335-4500 or (800) 421-4692
(answered all hours)
www.shl.uiowa.edu/kitsquotesforms/rabiesslip.pdf

Iowa State University Veterinary Diagnostic Lab (VDL)
College of Veterinary Medicine
Iowa State University
Ames, IA 50011
Tel: (515) 294-1950 or after hours (515) 290-1969 (Veterinary Teaching Hospital)
http://vetmed.iastate.edu/sites/default/files/vdl/forms/RabiesForm.pdf

Laboratories that perform the Rapid Fluorescent Focus Inhibition Test
(the CDC recognized test for assessing human antibody levels)

INTERPRETATION: A titer of 1:5 is considered adequate.
SHIPPING INFORMATION: Please send the following information with your specimen:

1. Address of person or institution responsible for receiving the results and billing information.
2. Complete vaccination history if possible.
3. All serum samples that are potentially pathogenic to humans should be labeled or marked with red tape or sticker.

SEND SAMPLES TO (any one of the following):

K-State Rabies Laboratory
Manhattan/K-State Innovation Center
2005 Research Park Circle
Manhattan, KS 66502
Main telephone: (785) 532-4483
Fax: (785) 532-4522 or (785) 532-4474
Email: rabies@vet.k-state.edu
Web address: www.vet.ksu.edu/rabies

Atlanta Health Associates
309 Pirkle Ferry Road, Suite D300
Cumming, GA 30040
(770) 205-9091 or (800) 717-5612
FAX: (770) 204-9021
Web address: www.atlantahealth.net/

Auburn University College of Veterinary Medicine
Note: Only animal specimens tested.
Dept. of Pathobiology, Virology Lab
261 Greene Hall
Auburn University, AL 36849-5519
(334) 844-2659
www.vetmed.auburn.edu/diagnostics

CURRENT LICENSED RABIES IMMUNIZING PRODUCTS FOR HUMANS:

Human Rabies Vaccine

A) Imovax ™ Rabies
Human diploid cell vaccine
Sanofi Pasteur Inc
Box 187 Discovery Dr
Swiftwater, PA 18370-0187
(800) 822-2463
(570) 839-7187
fax: (570) 839-0955
www.sanofipasteur.us

B) RabAvert ™
Purified chick embryo cell culture
Novartis
4560 Horton Street
Emeryville, CA 94608-2916
(800) 244-7668
fax: (510)923-3434
MN # (510) 655-8730
www.rabavert.com

Human Rabies Immune Globulin (HRIG)

A) Hyperrab
Talecris Biotherapeutics Inc
PO Box 110526
4101 Research Commons
79 T. W. Alexander Dr
Research Triangle Park, NC 27709
(800) 243-4153
www.talecrisbiousa.com

B) Imogam Rabies
Sanofi Pasteur Inc.
Box 187 Discovery Dr
Swiftwater, PA 18370-0187
(800) 822-2463
(570) 839-7187
fax: (570) 839-0955
www.sanofipasteur.us

FACT SHEET RABIES

What is rabies?
Rabies is a disease of the brain caused by a virus. It results from exposure to an animal with rabies. Rabies in humans is always fatal.

Who gets rabies?
Anyone can get rabies after exposure to a rabid animal. Rabies is spread when the virus from the animal's saliva (mouth) gets through a person's skin via open cuts or wounds or in the mouth or eyes. The chance that rabies infection will result varies with the type of the contact or "exposure."

What is exposure to rabies?
There are two types of exposure. One type is a bite (any penetration of the skin by teeth). The second is a non-bite exposure in which saliva or brain and spinal cord (neural) tissue from an animal with rabies gets into any, wound, open skin, eyes, nose, or mouth.

Bats pose a different problem. The bite of a bat can be so small that it may not be seen. People found in rooms with bats, who are unable to state, “I know I was not bitten,” should be considered potentially exposed. For example persons that awaken to find a bat in the room or children alone with a bat in a room should be considered exposed to rabies.

What animals get rabies?
Some animals are more likely to be infected with rabies than others. For example, meat-eating wild animals (especially skunks, raccoons, foxes, coyotes, bobcats and bats) most often get rabies. All domestic animals (such as dogs, cats, horses, and cattle) can be infected. Rodents (such as squirrels, hamsters, and mice) and lagomorphs (including rabbits and hares) rarely get rabies.

How can you tell if an animal is rabid?
Although some animals with rabies look and act normal, most will develop one of two distinct forms of the disease. One form is called "furious rabies." The infected animal is easily over-excited or angered. The other is "dumb rabies." In this type of rabies, the infected animal becomes calm and paralyzed (has difficulty moving). Usually, animals become irritable, restless, and nervous. An infected animal may have a tendency to eat unusual things like sticks, straw, stones, and soil. Difficulty swallowing causes the animal to drool saliva, but a drooling dog is not always a rabid dog. The only way to tell for sure whether an animal has rabies is to kill it in a humane manner and test its brain for the rabies virus.

How long can animals spread rabies?
Dogs and cats can spread rabies for several days before they become ill, and during illness. The amount of time varies for other animals.

What should you do if you are exposed to a rabid animal?
Immediately wash all bite wounds and scratches thoroughly with soap and water. Contact a doctor as soon as possible. Treatment for exposed individuals includes both human rabies immune globulin (HRIG) and rabies vaccine. Individuals previously immunized or treated for rabies exposure should receive only booster immunizations of rabies vaccine.

How can rabies be prevented?
- Vaccination of pets against rabies is the best way to reduce human exposure.
- Avoid contact with all wild animals.
- Do not keep wild animals as pets.
- Control of stray animals can decrease both animal and human exposure to rabies.
- Animals that have had contact with an animal that might have rabies should be reported to a veterinarian.

RABIES: Frequently Asked Questions
For the Human and Animal Health Communities

- IDPH provides general recommendations for rabies post exposure prophylaxis (treatment) based upon nationally accepted guidance. However, the decision of whether to administer post exposure prophylaxis (treatment) should be made on a case by case basis by the patient and their health care provider.
- IDPH is available for rabies consultation: call 800-362-2736 during business hours and 515-323-4360 after hours (Iowa State Patrol will contact the IDPH person on call).

1) Patient reports finding bats in their home on multiple occasions.

- Assess the risk of exposure and treat accordingly. Refer to the "Rabies Exposure Management for Bat-related Incidents Flowchart" available on the rabies page of the IDPH website. www.idph.state.ia.us/Rabies/Resources.aspx
- Recommend bat proofing the home
  - Iowa DNR licenses nuisance wildlife control operators. Some of these operators specialize in bat proofing. Link to licensed operators: www.iowadnr.gov/Hunting/LandownerAssistance/NuisanceWildlifeControl.aspx
- If bat proofing is not effective, pre-exposure vaccination could be considered. Ensure that patients understand even with pre-exposure vaccination, if they are exposed to a potentially rabid animal they will need 2 booster vaccinations (on days 0 and 3).

2) Patient has recently completed the rabies post exposure prophylaxis (treatment) series and was re-exposed to a potentially rabid animal.

- After determining that the person was exposed, administer 2 booster vaccinations on day 0 and day 3. (Do not administer Rabies Immunoglobulin)
- If the patient experiences multiple re-exposures, indicating multiple series of boosters in a relatively short amount of time, contact IDPH for consultation.

3) Patient is pregnant and was exposed to a potentially rabid animal.

- Because of the potential consequences of inadequately treated rabies exposure, pregnancy is not considered a contraindication to post-exposure prophylaxis (treatment).
- Several studies have shown no indication of increased incidence of abortion, premature births or fetal abnormalities associated with rabies vaccination.
- Rabies exposure or diagnosis of rabies in the mother is not an indication for pregnancy termination.
- If the risk of exposure to rabies is substantial, pre-exposure vaccination might also be indicated during pregnancy.

4) Patient was scratched by a potentially rabid cat.

- Rabies is most commonly transmitted through a bite, but can also be transmitted via saliva and nervous tissue contact to an open wound or mucous membrane.
- Nationally, there has been some concern over the risk associated with being scratched by potentially rabid cats (because cats commonly lick their claws). However, there has not been any definitive national guidance released on this issue, and IDPH is not aware of any documented cases of transmission via an animal scratch.
- Therefore, IDPH does not generally recommend post exposure prophylaxis (treatment) based upon scratch exposure alone.

5) Patient woke up to find a bat in the next room or elsewhere in the home.

- Recommendations state that if a bat is found in the same room as a sleeping person, small child, or incapacitated person it should be tested. If the bat is not available for testing it should be assumed positive and post exposure prophylaxis (treatment) should be considered. If a bat is found elsewhere in the home, post exposure prophylaxis (treatment) is generally not recommended by IDPH.

6) An immunosuppressed patient was exposed to a potentially rabid animal.

- Corticosteroids, other immunosuppressive agents, anti-malarials, and immunosuppressive illnesses can interfere with the development of active immunity after post-exposure prophylaxis (treatment). Immunosuppressive agents should not be administered during post-exposure prophylaxis (treatment) unless essential for the treatment of other conditions. When post-exposure prophylaxis (treatment) is administered to an immunosuppressed person, it is especially important that a serum sample be tested for rabies antibody to ensure that an acceptable antibody response has developed.
- Patients who are immunosuppressed by disease or medications should postpone pre-exposure vaccinations and consider avoiding activities for which rabies pre-exposure prophylaxis is indicated. When this course is not possible, immunosuppressed persons who are at risk for rabies should be vaccinated and their antibody titers checked.

7) A patient with a history of hypersensitivity to components of the rabies vaccine was exposed to a potentially rabid animal.

- When a person with a history of serious hypersensitivity to rabies vaccine must be revaccinated, antihistamines can be administered. Epinephrine should be readily available to counteract anaphylactic reactions, and the person should be observed carefully immediately after vaccination.

8) A patient was bitten by a domestic animal, who is responsible for implementing the animal quarantine?

- Under Iowa Code Chapter 351.39, Local Boards of Health are responsible for collecting human exposure reports and enforcing animal confinement or testing. In most jurisdictions, this function is fulfilled by local animal control, local public or environmental health, or the sheriff's departments. Please contact your local officials for clarification.

9) The patient has submitted the potentially rabid animal for rabies testing. Can post exposure prophylaxis (treatment) be delayed pending test results?

- In general, yes, if the animal is available to test administration of post exposure prophylaxis (treatment) should be delayed pending results. If the test results are positive, indeterminate, or unsuitable, post exposure prophylaxis (treatment) should be administered immediately. (Consult with IDPH if exposure is above the shoulders, severe or unusual, or if there is a delay in testing of animal.)

10) The patient received pre exposure vaccination prior to 1980 or has previously received post exposure prophylaxis (treatment) that varied from the current protocol. What is the recommended protocol for post exposure prophylaxis (treatment) for this exposure?

- If the exposed patient received pre exposure vaccination with a product that is not currently approved and has never had their titer checked, it is recommended that the patient receive the entire post exposure prophylaxis (treatment) protocol (RIG + the 4 or 5 dose vaccination series).

- In general, patients who received pre exposure vaccination after 1980 should have received a currently approved product.
    - Approved products include: Human Diploid Cell Vaccine, Rabies Vaccine Adsorbed (fetal rhesus lung diploid cell culture), and Purified Chick Embryo Cell Vaccine.
- The current post exposure (treatment) prophylaxis protocol includes administration of RIG + the 4 or 5 dose vaccination series. If the exposed patient has not received the current RIG + the 4 or 5 dose vaccination series in the past, the entire currently approved (RIG + the 4 or 5 dose vaccination series) protocol should be administered.
- IDPH is available for rabies consultation: call 800-362-2736 during business hours and 515-323-4360 after hours (Iowa State Patrol will contact the IDPH person on call).

11) If the patient was bitten above the shoulders, should post exposure (treatment) prophylaxis be delayed pending observation or laboratory testing?

- If the patient was bitten above the shoulders, the health care provider should consider initiating the appropriate post exposure (treatment) immediately.
- The closer the point of exposure is to the brain, the shorter the distance in which the virus must travel, therefore potentially resulting in a shorter disease incubation period.

Rabies (human)

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative
Organism: Rabies virus Animal species:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative
Organism: Rabies virus Animal species:

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Result date: / /
Result type: ☐ Preliminary ☐ Final Test type: Result: ☐ Positive ☐ Negative
Organism: Rabies virus Animal species:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Fever: ☐ Yes ☐No ☐ Unk Onset date: / / Duration: Hours/Days Highest known fever: C/F

Other symptoms:

Agitation ☐ Yes ☐No ☐ Unk
Aversion to airflow on face ☐ Yes ☐No ☐ Unk
Aversion to water ☐ Yes ☐No ☐ Unk
Coma ☐ Yes ☐No ☐ Unk
Delirium ☐ Yes ☐No ☐ Unk
Encephalitis ☐ Yes ☐No ☐ Unk
Excitability ☐ Yes ☐No ☐ Unk
Fever ☐ Yes ☐No ☐ Unk
Headache ☐ Yes ☐No ☐ Unk
Malaise ☐ Yes ☐No ☐ Unk
Muscle weakness ☐ Yes ☐No ☐ Unk
Paralysis ☐ Yes ☐No ☐ Unk
Seizures ☐ Yes ☐No ☐ Unk
Sensory changes ☐ Yes ☐No ☐ Unk
Trouble swallowing ☐ Yes ☐No ☐ Unk

Bite present: ☐ Yes ☐No ☐ Unk Bite location:

Neck/head ☐ Yes ☐No ☐ Unk
Upper extremity ☐ Yes ☐No ☐ Unk
Trunk ☐ Yes ☐No ☐ Unk
Lower extremity ☐ Yes ☐No ☐ Unk

Site cleaned at time of event: ☐ Yes ☐No ☐ Unk

TREATMENT

Pre-exposure vaccination

Vaccinated for rabies: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	**Date vaccinated:** / /	**Date vaccinated:** / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:
Date vaccinated: / /	**Date vaccinated:** / /	**Date vaccinated:** / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

Number of vaccinations: ____

Post-exposure treatment

Rabies Immune Globulin: ☐ Yes ☐ No ☐ Unknown

Date given: _____

Dose: _____ Unit: _____

Route: _____

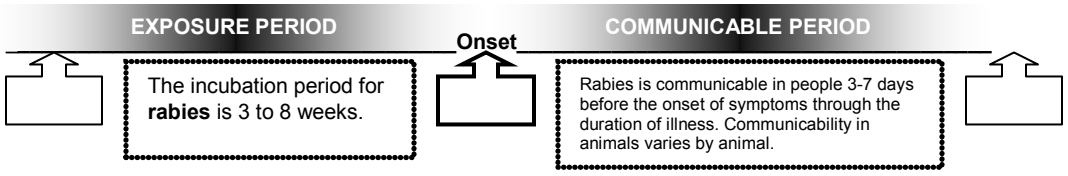
Vaccinated for this exposure: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	**Date vaccinated:** / /	**Date vaccinated:** / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:
Date vaccinated: / /	**Date vaccinated:** / /	**Date vaccinated:** / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

Therapeutic medication prescribed: ☐ Yes ☐ No ☐ Unk **List medications:** _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risks 8 weeks prior to onset of symptoms:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa: _____	Departure date: / /	Return date: / /
Traveled within U.S.? ☐ Yes ☐ No ☐ Unk	State: _____ City: _____	Departure date: / /	Return date: / /
Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk	Country: _____	Departure date: / /	Return date: / /

Animal contact: ☐ Yes ☐ No ☐ Unknown

Animal:

Bats	☐ Yes ☐ No ☐ Unknown	Goats	☐ Yes ☐ No ☐ Unknown	**Animal type:**	Domestic	☐ Yes	☐No	☐ Unk
Beavers	☐ Yes ☐ No ☐ Unknown	Horses	☐ Yes ☐ No ☐ Unknown		Stray	☐ Yes	☐No	☐ Unk
Cats	☐ Yes ☐ No ☐ Unknown	Pigs	☐ Yes ☐ No ☐ Unknown		Wild	☐ Yes	☐No	☐ Unk
Cattle	☐ Yes ☐ No ☐ Unknown	Raccoon	☐ Yes ☐ No ☐ Unknown		Unknown	☐ Yes	☐No	☐ Unk
Coyote	☐ Yes ☐ No ☐ Unknown	Sheep	☐ Yes ☐ No ☐ Unknown					
Dogs	☐ Yes ☐ No ☐ Unknown	Skunk	☐ Yes ☐ No ☐ Unknown					

Animal breed: _____ **Animal description:** _____

Exposure type:

Bat in house	☐ Yes	☐No	☐ Unk	Contact with saliva	☐ Yes	☐No	☐ Unk
Bat in sleeping area	☐ Yes	☐No	☐ Unk	Scratch	☐ Yes	☐No	☐ Unk
Bat or animal bite	☐ Yes	☐No	☐ Unk	Unknown	☐ Yes	☐No	☐ Unk

Date exposure occurred: / /

Animal vaccination status: ☐ Unvaccinated ☐ Vaccine not current ☐ Vaccinated ☐ Unknown

Animal vaccination date: / /

Was bite provoked: ☐ Yes ☐No ☐ Unk

Exposure site information

Address: _____

City: _____ State: _____

Zip: _____ County: _____

Phone: _____ Type: _____

Animal disposition

Lost to follow-up	☐ Yes	☐No	☐ Unk
Deceased and sent for testing	☐ Yes	☐No	☐ Unk
Deceased and NOT sent for testing	☐ Yes	☐No	☐ Unk
Ill and under quarantine	☐ Yes	☐No	☐ Unk
Ill and NOT under quarantine	☐ Yes	☐No	☐ Unk
Healthy and under quarantine	☐ Yes	☐No	☐ Unk
Healthy after 10 days of quarantine	☐ Yes	☐No	☐ Unk

Animal Owner known: ☐ Yes ☐ No ☐ Unknown

Animal control name/veterinarian: _____

Address: _____

City: _____ State: _____

Zip: _____ County: _____

Phone: ( )- - Type: _____

Animal quarantine site information Facility name: _____

Address: _____

City: _____ State: _____

Zip: _____ County: _____

Phone: ( )- - Type: _____

CONTACTS

Contacts with the same exposures? ☐ Yes ☐ No ☐ Unknown

Contacts with the same exposures as the case or exposures to the case (while case was symptomatic)

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		/ /	☐ Yes
☐ Child	☐ Family member (non-household)			☐ No
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse	☐ Sexual contact		/ /	☐ Yes
☐ Child	☐ Family member (non-household)			☐ No
☐ Sibling	☐ Friend/acquaintance			
☐ Roommate	☐ Contact- work/school/etc			
☐ Parent/ guardian	☐ Unknown/Other			

If this contact is a case create a new event and/or case for this contact.

NOTES: _____

PRE-EXPOSURE VACCINATION AND POST-EXPOSURE PROPHYLAXIS (TREATMENT) PROTOCOLS:

Pre-exposure Vaccination:

Three 1.0-mL injections of vaccine IM on days 0, 7, and 21 or 28
(1.0-mL dose is standard for all patients)

Post-exposure Prophylaxis: (treatment)

- **Wound Cleaning:** immediately cleanse with soap and water. Use a virucidal agent such as povidone- iodine solution to irrigate the wound.

- **Patients who HAVE NOT received Pre-exposure vaccination or a previous course of Post-exposure Prophylaxis (treatment):**
  - **Rabies Immunoglobulin:** *20IU/kg body weight.* If possible the full dose should be infiltrated around the wound and any remaining volume should be administered IM at a site distant from the vaccine administration.
  - **Vaccine:**
    - **Immune competent patients:** Four 1.0-mL injections of vaccine IM on days 0, 3, 7, and 14. *(1.0-mL dose is standard for all patients)*
    - **Immune suppressed patients:** Five 1.0-mL injections of vaccine IM on days 0, 3, 7, 14, and 28. A titer check should also be performed between days 42 and 56.
- **Patients who HAVE received Pre-exposure vaccination or a previous course of Post-exposure Prophylaxis (treatment) according to the currently accepted protocols:**
  - **Vaccine ONLY:** two 1.0-mL injections of vaccine IM on days 0, 3

*****These recommendations are taken from the CDC Human Rabies Prevention, MMWR. This document is accessible on the IDPH website: www.idph.state.ia.us/Rabies/Resources.aspx

RABIES RESOURCE MANUAL

Prepared by:
Iowa Department of Agriculture and Land Stewardship
Iowa Department of Public Health
Iowa Veterinary Medical Association

Updates to this Document:

- This document was last updated on July 8, 2010
- This document will be reviewed and updated annually
- The most recent version of this document is available at: www.idph.state.ia.us/adper/rabies.asp

Contributors:

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- Dr. Thomas Johnson, Executive Director, Iowa Veterinary Medical Association

TABLE OF CONTENTS

Appendixes:

I. Background on Rabies, also known as Hydrophobia or Lyssa

(Source: IDPH Epi Manual)

THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

The virus that causes rabies is a rhabdovirus of the genus *Lyssavirus.*

B. Clinical Description

Animal Rabies

Rabies is primarily a disease of the central nervous system. Animals with rabies can appear normal, meek ("dumb rabies"), or may be aggressive ("furious rabies"). Animals with furious rabies often exhibit aggressive or unusually excited behavior; they may excessively salivate and attack other animals or humans. Dumb rabies may be more difficult to detect; animals may seem tame, wounded, or dazed. These animals have been described as acting disoriented or suffering from some paralysis, for example dogs may present with paralysis of the lower jaw and their tongue may be hanging out. While these behaviors are commonly reported, an animal's behavior alone is *not* a reliable indicator of whether it has rabies. Rabies should be considered in mammals with signs or symptoms of encephalitis or myelitis, including autonomic instability, dysphagia, hydrophobia, paresis, and paresthesia.

Human Rabies

Rabies is a fatal infection, which usually progresses over 2 – 21 days. A prodromal phase, lasting 2 – 10 days, is characterized by pain and numbness/tingling at the site of the bite (present in 50% – 80% of cases), and nonspecific complaints such as fatigue, headache and fever. Behavioral changes may also be apparent, including apprehension, anxiety, agitation, irritability, insomnia and depression. The prodromal phase is quickly followed by the neurologic phase, during which the patient may suffer disorientation and hallucinations; paralysis; episodes of terror and excitement; hydrophobia; hyperventilation; hypersalivation; and seizures. These symptoms are invariably followed by coma and death. Once symptoms have begun, the illness is almost always fatal.

Rabies should be considered in patients with signs or symptoms of encephalitis or myelitis, including autonomic instability, dysphagia, hydrophobia, paresis, and paresthesia, particularly if a nonspecific prodrome preceded the onset of these signs by three to four days. Progressive worsening of neurologic signs is characteristic of rabies and should be considered as a positive indicator for rabies. Laboratory tests to rule out common encephalitides (herpes, enteroviruses, arboviruses) should be performed. Negative results of these tests would increase the likelihood of rabies as the diagnosis. If a patient presents with symptoms similar to the ones described above, but the neurologic status does not change and the illness continues for longer than three weeks, rabies is unlikely as the diagnosis.

C. Reservoirs

All species of mammals are susceptible to rabies infection.

D. Modes of Transmission

Rabies is spread via the virus-laden saliva of an infected animal through a bite or saliva contact with mucous membranes or a fresh break in the skin. Breaks in the skin or mucous membrane exposure to nervous tissue (brain, spinal cord) of an infected animal also pose a transmission threat. Bites of some

animals, such as bats, can inflict injury so minor that it goes undetected. Airborne spread (for example, in a cave with many bats, or in a laboratory through rabies virus or specimens) has occurred. Rabies is not transmitted through contact with blood, urine, skunk spray, or feces of an infected animal.

Person-to-person spread has been documented after organs and corneas were transplanted from rabies infected individuals. Two nonlaboratory-confirmed cases of person-to-person rabies transmission in Ethiopia have been described. The reported route of exposure in both cases was direct saliva contact (a bite and a kiss).

E. Incubation period

Animal Rabies

Depending on the animal, the incubation period may vary from a few weeks to a few years, but is typically 1 - 3 months. Some animals, such as dogs and cats, have been studied extensively. The incubation period of their disease is commonly three to five weeks.

Human Rabies

The incubation period is usually 3 - 8 weeks, but can rarely range from as few as 9 days (although 9-day incubation periods have not been documented in the U.S. with native strains) to as many as 7 years. Less than 1 percent of human cases have an incubation period longer than 6 months. The incubation period is typically related to the site of exposure; *e.g.,* the incubation period is usually shorter if the virus is inoculated closer to the central nervous system or in a highly innervated area. The incubation period also depends on exposure severity (more virus results in a shorter incubation period) and the age of the exposed person (younger age generally results in a shorter incubation period).

F. Period of Communicability or Infectious Period

Animal Rabies

Animals are not infectious until virus is present in their saliva, which happens around the time of clinical onset of illness. Dogs, cats and ferrets may shed virus in their saliva for 3 – 7 days before the onset of clinical signs, and continue to shed virus until death. The shedding/communicability period for most wild animals has not been determined, although skunks may shed virus up to 18 days before death. Carcasses of animals with rabies may contain infectious virus, depending on temperature and environmental conditions. Rabies virus may persist in a frozen carcass for many weeks; drying and sunlight rapidly deactivate rabies virus. Dried saliva does not contain live rabies virus.

Human Rabies

The period during which a patient is potentially infectious may begin up to 1 week before symptom onset and last until death. Saliva is considered potentially infectious, as are cerebrospinal fluid and organs (although viral concentrations in humans are 3 – 4 times lower than in dogs).

G. Epidemiology

Animal rabies

Animal rabies exists in most parts of the world. In the United States, Hawaii is the only state that has never reported an indigenously-acquired rabies case in humans or animals. In the U.S., domestic species accounted for 7% of all rabid animals reported in 2008. The number of reported rabid domestic animals increased among cats and cattle and decreased among dogs, horses, sheep, and goats during 2008. In 2008, cases of rabies in cats increased 12.2% compared with the number

reported in 2007. The number of rabies cases reported in cats is routinely 3-4 times that of rabies reported in cattle or dogs. In 2008 approximately 1% of cats and 0.3% of dogs tested for rabies were found positive.

Human Rabies

Worldwide an estimated 35,000–40,000 human rabies deaths occur each year. The vast majority of these deaths occur in developing countries. In the United States from 1995 through 2006, there were 37 human cases, of which 36 were fatal. Four cases were the result of solid tissue organ transplantation; 28 cases were associated with bat variants; one was associated with the raccoon variant; and eight were associated with the canine variant. The most recent human cases of rabies in Iowa occurred in 1951 and 2002. The 2002 case was caused by the bat strain of rabies virus.

ASSESSING THE NEED FOR HUMAN POST-EXPOSURE PROPHYLAXIS (PEP)

Assessing the need to provide post-exposure prophylaxis to humans exposed to animals suspected to have rabies should be determined by asking a series of questions. Each question needs to be answered to determine if PEP needs to be initiated. The questions to ask include:

1) Is the animal species known to carry rabies?
2) Did an actual exposure occur?
3) Can the animal be tested or quarantined?

Question 1. Is the animal species known to carry rabies?

Wild Animals:

In wild animals the rabies risk varies by species:

- High-risk animals are those that are known to commonly carry rabies. In Iowa, these include skunks, bats, raccoons, foxes, and coyotes.
- Medium-risk animals have very rarely been found to carry rabies in Iowa and may include large rodents such as beaver, muskrat, and woodchuck.
- Low-risk animals are those that almost never carry rabies when they are demonstrating normal behavior. These include small rodents, squirrels, opossum, and lagomorphs (rabbits). If these species **are** acting abnormally you should consider them potentially rabid.

Dogs, Cats, Ferrets, Horses and Livestock:

Dogs, cats, ferrets, horses, and livestock periodically test positive for rabies each year in Iowa.

Other Species:

Contact CADE for consultation. Call 800-362-2736 during business hours or 515-323-4360 after hours.

Question 1 Interpretation:

If it has been determined that the animal involved is a potential carrier of rabies, the clinician should move to the second question. (Whether or not an animal has been vaccinated is **immaterial to assessment** because, though vaccination decreases the risk of the animal being rabid, it is not a guarantee.)

Question 2. Did an exposure actually occur?

Rabies is primarily transmitted through saliva or neural tissue contact to open wounds (including through bites) or mucous membranes. The virus will not cross intact skin. Review the following lists to determine if a rabies exposure has occurred.

Salivary exposures could include:

- Bites
- Saliva contact to mucous membranes
- Saliva contamination of an open wound

Non-salivary exposures could include:

- Neural tissue contact to an open wound or mucous membrane (ie. if a person shoots an animal in the head and is splattered with brain material in eyes, nose, or mouth)
- Organ transplants from patients who died of undiagnosed rabies infection
- Exposure to large amounts of aerosolized rabies virus (e.g., explorers of caves colonized by rabid bats).

Situations that are not considered rabies exposures and do not indicate PEP:

- Petting a rabid animal
- Contact with blood, urine, scent of skunks, and feces

Bats pose a unique problem. The bite of a bat can be so small that it may be undetected. In addition to the exposures listed above, review the following lists to determine if a rabies exposure has occurred.

Additional situations that are also considered potential exposures include:

- People that awaken from sleep to find a bat in the room they are sleeping in
- A bat is found in a room with children or incapacitated individuals without supervision
- If a person has direct physical contact with a bat and cannot definitely say they were not bitten (i.e. a bat flies into a person's arm)

A situation that is not considered an exposure includes:

- People that are awake and find themselves in a room with a bat and can state that they were not bitten by the bat

Question 2 Interpretation:

If it has been determined that a potential exposure occurred, the clinician should move to the third question to determine if the animal involved can be tested or quarantined.

Question 3. Can the animal be tested or quarantined?

Bats

If available, the bat should be tested for rabies. If the bat is unavailable for testing, PEP is recommended.

Wild Animals

High risk animals should be euthanized and submitted for rabies testing. In cases in which the animals are unavailable for testing, they should be assumed rabid and PEP is recommended.

All medium-risk animals and any low-risk animal behaving abnormally. If the animal is available, it should be submitted for testing. If the animal is not available, PEP should be considered and the exposed person should consult with their personal physician to make the determination.

Dogs, Cats or Ferrets

Dogs, cats and ferrets that have bitten or exposed a human to their saliva and appear healthy may be quarantined for 10 days in lieu of euthanasia and testing. If at any time during the quarantine period, a dog, cat, or ferret shows signs of rabies, the animal should be immediately euthanized and tested.

Dogs, cats and ferrets that are incubating rabies will begin to exhibit signs of the disease very soon after they begin shedding virus in saliva. If an animal remains healthy during the 10-day quarantine, it could not have been shedding rabies virus in its saliva at the time of the bite or saliva exposure. This does not guarantee that the animal is not incubating rabies; it only indicates that the animal was not infectious at the time in which the human was exposed.

A dog, cat, or ferret that is not available for observation or testing should be considered potentially rabid and PEP is recommended. If capture of the dog, cat, or ferret is likely in the near future, prophylaxis may be delayed up to 72 hours. If the animal is not located within 72 hours PEP should be initiated.

Other Animal Species

For exposure to other animal species, recommendations are made on a case-by-case basis. Contact IDPH for consultation.

HUMAN POST-EXPOSURE PROPHYLAXIS PROTOCOL

Severe Bites above the Shoulder

If a patient is bitten above the shoulder, IDPH recommends starting PEP immediately. The closer the point of exposure is to the brain, the shorter the distance in which the virus must travel, therefore potentially resulting in a shorter disease incubation period.

If the animal subsequently tests negative for rabies, or if the animal is quarantined and is healthy at the end of 10 days (quarantines can only be conducted in dogs, cats, and ferrets) Post Exposure Prophylaxis can be discontinued at that time. If Post Exposure Prophylaxis is discontinued before the series is completed and the patient is exposed again in the future, the entire Post Exposure Prophylaxis series should be administered. If the Post Exposure Prophylaxis series is completed and the patient is exposed again in the future, only two doses of rabies vaccine on days 0 and 3 should be administered.

Human Post Exposure Prophylaxis

- Immediately and thoroughly wash all bite wounds and scratches with soap and water. Simple wound cleaning has been shown to markedly reduce the risk of rabies.
- Tetanus prophylaxis should be considered
- Risk of bacterial infections should be assessed and addressed.

1. Treatment of persons who have **not previously received rabies vaccine or have not previously received rabies post-exposure treatment**.

a. **Immunocompetent patients:**

- ***Four*** 1-mL vaccine doses of HDCV or PCECV should be administered intramuscularly to previously unvaccinated persons as soon as possible after exposure on days 0, 3, 7, and 14 (day 0 is the day the post exposure prophylaxis is started).
- One dose of rabies immunoglobulin (HRIG), 20 IU/kg, should also be administered on day 0.
    - If anatomically feasible, the full dose of HRIG should be thoroughly infiltrated in the area around the wound. The rest should be administered intramuscularly at a different site than the vaccine.
    - If HRIG is not given with the first post-exposure dose of vaccine, it must be given within eight days after the first dose of vaccine.

b. Immunocompromised patients:

- ***Five*** 1-mL vaccine doses of HDCV or PCECV should be administered intramuscularly to previously unvaccinated persons as soon as possible after exposure on days 0, 3, 7, 14, ***and 28***.
- One dose of rabies immunoglobulin (HRIG), 20 IU/kg, should also be administered on day 0.
    - If anatomically feasible, the full dose of HRIG should be thoroughly infiltrated in the area around the wound. The rest should be administered intramuscularly at a different site than the vaccine.
    - If HRIG is not given with the first post-exposure dose of vaccine, it must be given within eight days after the first dose of vaccine.

How is immunocompromised defined in terms of rabies vaccination?
The decision of whether individuals are immunocompromised should be determined by a physician. However, to assist with this determination, persons with the below conditions may need to receive ***five*** doses of rabies vaccine (consult with their healthcare provider).

A. Persons with immunocompromising conditions or on specific medications (non-HIV)
Examples include but are not limited to:
1) Congenital immunodeficiency
2) Leukemia
3) Lymphoma
4) Generalized malignancy
5) Therapy with alkylating agents, antimetabolites, radiation, or large amounts of corticosteroids.
6) Antimalarial medications

B. Persons with HIV infection
Both symptomatic and asymptomatic patients with HIV infection

C. Persons with conditions that cause limited immune deficits
Examples include but are not limited to:
1) Renal failure
2) Diabetes (uncontrolled)

3) Alcoholic cirrhosis
4) Asplenia

When rabies pre- or postexposure prophylaxis is administered to an immunosuppressed person, one or more serum samples should be tested 1—2 weeks after vaccination for rabies virus-neutralizing antibody by the RFFIT test to ensure that an acceptable antibody response has developed after completing the series.

If no acceptable antibody response (complete neutralization of virus at a 1:5 serum dilution is considered acceptable) is detected after the final dose in the pre- or postexposure prophylaxis series, the patient should be managed in consultation with their physician and appropriate public health officials.

2. Treatment of persons who have either received pre-exposure vaccination or have previously received rabies post-exposure treatment (according to the current protocols and with approved products, if unsure contact CADE for consultation):
    a. Two IM doses (1.0 ml each) of vaccine should be administered on days 0 and 3. Human Rabies Immune Globulin should NOT be administered.

Exposure to a Human Potentially Infected with Rabies

Contact isolation for respiratory secretions should be in place for persons suspected or confirmed to have rabies. Articles soiled with saliva should be disinfected. Attending personnel should be protected (gloves, gowns, face protection) against any exposure to saliva. If a patient who has rabies (or is suspected of having rabies) exposes another person to saliva (through a bite or via infectious material exposure to an open wound or mucous membrane), rabies PEP of the contact should be started. Other people from the patient's home, social, and work environment should be contacted to review their potential exposure.

Precautions and Contraindications to Rabies Prophylaxis

For information on contraindications and precautions see the Human Rabies Prevention Recommendations of the Advisory Committee on Immunization Practices available on the CDC Web site: http://www.cdc.gov/mmwr/PDF/rr/rr5703.pdf .

RECOMMENDATIONS FOR DOMESTIC ANIMALS EXPOSED TO RABID OR POTENTIALLY RABID ANIMALS

This section refers to any animal exposed to a confirmed or suspected rabid animal. Wild mammalian carnivores or bats that are not available or suitable for testing should be regarded as rabid animals.

Dogs, Cats, or Ferrets

Unvaccinated dogs, cats, and ferrets exposed to a rabid animal should be euthanized immediately. If the owner is unwilling to have this done, the animal should be placed in strict isolation for 6 months. Isolation in this context refers to confinement in an enclosure that precludes direct contact with people and other animals. Rabies vaccine should be administered upon entry into isolation or 1 month prior to release to comply with pre-exposure vaccination recommendations. Animals overdue for a booster vaccination should be considered unvaccinated.

There are currently no USDA licensed biologics for post-exposure prophylaxis of previously unvaccinated domestic animals, and there is evidence that the use of vaccine alone will not reliably prevent the disease in these animals.

Dogs, cats, and ferrets that are **currently vaccinated** should be revaccinated immediately, kept under the owner's control, and observed for 45 days. Any illness in an isolated or confined animal should be reported immediately to the local health department. If signs suggestive of rabies develop, the animal should be euthanized and the head shipped for testing.

Livestock

All species of livestock are susceptible to rabies; cattle and horses are the most frequently reported infected species.

Livestock exposed to a rabid animal and **currently vaccinated with a vaccine approved by USDA for that species** should be revaccinated immediately and observed for 45 days.

Unvaccinated livestock should be euthanized immediately. If the animal is **not euthanized** it should be kept under close observation for 6 months. Any illness in an animal under observation should be reported immediately to the local health department and veterinarian. If signs suggestive of rabies develop, the animal should be humanely euthanized and the head removed by a licensed veterinarian and shipped for testing.

Multiple rabid animals in a herd or herbivore-to-herbivore transmission are uncommon; therefore, restricting the rest of the herd if a single animal has been exposed to or infected by rabies is usually not necessary.

Handling and consumption of tissues from exposed animals may carry a risk for rabies transmission. Risk factors depend in part on the site(s) of exposure, amount of virus present, severity of wounds, and whether sufficient contaminated tissue has been excised. If an exposed animal is to be slaughtered for consumption, it should be done immediately after exposure and all tissues should be cooked thoroughly. Persons handling exposed animals, carcasses, and tissues should use barrier precautions. Historically, federal guidelines for meat inspectors required that any animal known to have been exposed to rabies within 8 months be rejected for slaughter. USDA Food and Inspection Service (FSIS) meat inspectors should be notified if such exposures occur in food animals prior to slaughter.

Rabies virus may be widely distributed in tissues of infected animals. Tissues and products from a rabid animal should not be used for human or animal consumption. Pasteurization temperatures will inactivate rabies virus, therefore, inadvertently drinking pasteurized milk or eating thoroughly cooked animal products does not constitute a rabies exposure.

Other Animals

Other mammals exposed to a rabid animal should be euthanized immediately. Animals maintained in USDA-licensed research facilities or accredited zoological parks should be evaluated on a case-by-case basis.

Source: The Compendium of Animal Rabies Prevention and Control, 2008 National Association of State Public Health Veterinarians, Inc. (NASPHV)
http://www.nasphv.org/documentsCompendia.html

PREVENTIVE MEASURES

Environmental Measures

Human rabies control relies on controlling rabies in the animal population, therefore animal quarantine regulations and vaccination laws should be enforced. In Iowa, all dogs over 6 months of age are required to be vaccinated against rabies by a licensed veterinarian. The state department of agriculture and land stewardship recognizes the standards set forth in the Compendium of Animal Rabies Prevention and Control Guidelines. Currently, there are approved rabies vaccines for use in dogs and other animals that are as young as 3 months of age. Rabies vaccination is strongly encouraged in all companion animals (including horses) and valuable livestock.

Education

Offer the following advice to the public to help prevent rabies:

- Vaccinate pets; dogs are required by law to be vaccinated. Although not required by law, cat, ferret, horse and valuable livestock vaccinations are recommended.
- Do not feed or handle wild or stray animals. Avoid sick animals or those that act strangely.
- Do not touch or handle dead animals.
- Contact local animal control officer with questions about the capture of an animal or handling of a carcass.
- Cover garbage cans and keep pet food indoors, so wild animals are not attracted.
- Do not keep wild animals as pets, which is often illegal as well as dangerous.
- Never handle bats. A bat bite or scratch may be small and go unnoticed. People who awaken to find a bat in the room or children awake or asleep with a bat in a room may require PEP.
- Recommend that travelers to developing countries with endemic rabies receive pre-exposure prophylaxis if they will be visiting in situations where exposure is likely (e.g., camping, hiking, backpacking, or away from areas where treatment for a bite wound is available). Travelers should be warned to avoid petting or otherwise having contact with stray animals.

Note: For more information about international travel and rabies, contact the CDC Traveler's Health Office at (877) 394-8747 or via the internet at http://www.cdc.gov/travel

HUMAN PRE-EXPOSURE VACCINATION

Pre-exposure vaccination is recommended for persons in the following categories:

- Veterinarians
- Animal handlers
- Laboratory workers who handle rabies virus
- Persons living in or visiting countries where rabies is endemic
- Others whose occupations or hobbies bring them into contact with potentially rabid animals

Pre-Exposure Vaccination Protocol:

Three 1.0 ml injections of vaccine given intramuscularly on each of days 0, 7, and 21 or 28.

NOTE: Pre-exposure vaccination does **NOT** eliminate the need for prompt post-exposure prophylaxis. If persons who have completed the pre-exposure vaccination series are subsequently exposed to rabies, the following protocol should be followed (as stated on page 7):

- Two IM doses (1.0 ml each) of vaccine, on days 0 and 3. Human Rabies Immune Globulin should NOT be administered.

Monitoring Pre-Exposure Vaccination Titers:

Persons who work with live rabies virus in research laboratories or vaccine production facilities and are under continuous risk of unapparent rabies virus exposure should have their serum rabies antibody titer measured every 6 months. Acceptable antibody level is 1:5 titer by the rapid fluorescent focus inhibition test (RFFIT) technique. See the list of laboratories performing the serologic test below. If the antibody level is less than 1:5, booster doses of vaccines should be administered to maintain a serum titer corresponding to at least complete neutralization at a 1:5 serum dilution by RFFIT.

Persons who frequently come in contact with potentially rabid animals, such as **veterinarians, veterinary technicians, animals control officers, or wildlife officers**, should have a serum sample tested for rabies antibody every **2 years**. If their antibody level is less than complete neutralization at a 1:5 serum dilution by the RFFIT, the person should receive a single booster dose of vaccine.

Laboratories that perform the Rapid Fluorescent Focus Inhibition Test (the CDC recognized test for assessing human antibody levels)

INTERPRETATION: A titer of 1:5 is considered adequate.

SHIPPING INFORMATION: Please send the following information with your specimen:

1. Address of person or institution responsible for receiving the results and billing information.
2. Complete vaccination history if possible.
3. All serum samples that are potentially pathogenic to humans should be labeled or marked with red tape or sticker.

SEND SAMPLES TO (any one of the following):

K-State Rabies Laboratory
Manhattan/K-State Innovation Center
2005 Research Park Circle
Manhattan, KS 66502
Main telephone: (785) 532-4483
Fax: (785) 532-4522 or (785) 532-4474
Email: rabies@vet.k-state.edu
Web address: http://www.vet.ksu.edu/rabies

Atlanta Health Associates
309 Pirkle Ferry Road, Suite D300
Cumming, GA 30040
(770) 205-9091 or (800) 717-5612
FAX: (770) 204-9021

Web address: http://www.atlantahealth.net/

Auburn University College of Veterinary Medicine
Note: Only animal specimens tested.
Dept. of Pathobiology, Virology Lab
261 Greene Hall
Auburn University, AL 36849-5519
(334) 844-2659
Web address:
http://www.vetmed.auburn.edu/uploads/6b/61/6b61faa8c3b81bcdc55ef2f6ffbd7ece/RFFITform_10_09.pdf

INDIGENT PATIENT PROGRAMS

Patient assistance programs that provide medications to uninsured or underinsured patients are available for rabies vaccine and Immune globulin.

Sanofi Pasteur's Patient Assistance Program (providing Imogam ® Rabies-HT and Imovax ® Rabies as well as other vaccines) is now administered through the Franklin Group. A healthcare professional or patient can either contact the Franklin Group directly, or call the customer service team (1-800-VACCINE) who will transfer them to the Franklin Group. The Franklin Group will review the application against the eligibility criteria. For more information about the program or to request an application, please contact the Sanofi Pasteur, Inc. Patient Assistance Program (Franklin Group) at 1 (866) 801-5655.

Novartis' Patient Assiatance Program for RabAvert ® is managed through RX for Hope and can be accessed at 800-244-7668. Instructions and request forms are also available at the Rx for Hope website https://www.rxhope.com/PAP/info/PAPList.aspx?drugid=319&fieldType=drugid .

II. Animal Rabies Testing Resources in Iowa

There are two laboratories in Iowa that provide animal rabies testing services: University of Iowa Hygienic Laboratory and Iowa State University Veterinary Diagnostic Laboratory.

University of Iowa Hygienic Laboratory (UHL):

UHL is the designated state public health laboratory in Iowa. UHL receives state funding enabling them to provide free testing services for diseases of public health concern. Therefore, UHL will test potentially rabid animals that have exposed humans free of charge. UHL does not provide testing for animal to animal exposures; therefore those samples should be submitted to Iowa State University Veterinary Diagnostic Laboratory.

Iowa State University Veterinary Diagnostic Laboratory (ISU VDL):

ISU VDL has historically provided animal rabies testing as a service to veterinarians who may be ruling out rabies as one of several differential diagnosis. However, in recent years ISU VDL has received an increasing number of requests for rabies testing of domestic, livestock, and wildlife species where the submitter is only requesting rabies testing without additional diagnostics. While ISU VDL is willing and able to provide that service to the public, healthcare, and veterinary communities, they do not receive any state or federal funding to support testing. Therefore, ISU VDL must charge for the testing to cover their operating expenses. ISU VDL will provide rabies testing for cases of animal and/or human exposure.

Specimen Submission and Transportation:

Specimen Preservation:

- If the specimen will not be submitted for testing immediately, it should be refrigerated until transported or shipped.
- **DO NOT FREEZE THE SPECIMEN**

Specimen Transport:

- **Private vehicle is the fastest and preferred way to get the specimen to the laboratory.**
  - Double bag the specimen
  - Place the specimen in a hard sided container, such as a Styrofoam cooler
  - Place ice packs around the double bagged specimen to keep it cool during transport
  - Include the appropriate Rabies Test Request Form from UHL or ISU
  - Call the appropriate laboratory before departure
- Commercial courier service, such as FedEx, can also be used.
  - Double bag the specimen
  - Place the double bagged specimen in a hard sided container, such as a Styrofoam cooler.
  - Place ice packs around the double bagged specimen to keep it cool -DO NOT FREEZE.
  - Place the completed Rabies Test Request Form in a separate plastic bag to prevent it from becoming wet or contaminated. Place the bagged Rabies Test Request Form in the hard sided container.
    - Firmly secure the lid of the hard sided container.
    - Package (place in a box) the hard sided container and ship.
    - Ship via **overnight courier**.

NOTE: Improper packaging and/or delayed delivery may compromise the integrity of the brain material rendering the specimen unsatisfactory for testing.

Specimen submission guidelines:

- **Large/medium animals-** If only requesting rabies testing, a veterinarian needs to remove the head and only the head should be submitted for testing*****.
- **Bats-** Try not to crush the skull of the bat. Submit the entire animal.
- **Small animals (mice, squirrels, etc):** Submitting the entire animal is preferred.

***If a veterinarian is requesting other diagnostics from ISU VDL all appropriate samples should also be included. In some cases, this may mean that the entire animal should be submitted.**

Laboratory Contact Information:

UHL:
319-335-4500 or 800-421-4692 (answered all hours)

ISU VDL:
During business hours call 515-294-1950 – after hours call 515-290-1969

III. Quarantine Authority and Enforcement

Authority to mandate that an animal be placed in quarantine:

(Dogs, cats, and ferrets are the only animals that can be quarantined according to national recommendations.)

State of Iowa Law:

351.39 Confinement .

If a local board of health receives information that an animal has bitten a person or that a dog or animal is suspected of having rabies, the board shall order the owner to confine such animal in the manner it directs. If the owner fails to confine such animal in the manner directed, the animal shall be apprehended and impounded by such board, and after ten days the board may humanely destroy the animal. If such animal is returned to its owner, the owner shall pay the cost of impoundment. This section shall not apply if a police service dog or a horse used by a law enforcement agency and acting in the performance of its duties has bitten a person.

[C66, 71, 73, 75, 77, 79, 81, §351.39]

2001 Acts, ch 19, §1; 2001 Acts, ch 176, §68

351.36 Enforcement.

Local health and law enforcement officials shall enforce the provisions of sections 351.33 to 351.43 relating to vaccination and impoundment of dogs. Such public officials shall not be responsible for any accident or disease of a dog resulting from the enforcement of the provisions of said sections.

[C66, 71, 73, 75, 77, 79, 81, §351.36]

Quarantine Enforcement

Several years ago, the Iowa Department of Public Health surveyed counties to get a better understanding of how they respond to potential rabies exposure cases. While some counties had extremely detailed protocols for addressing rabies exposure situations, others did not.

Most counties responded that animal bites were addressed by one the following entities:

- Local public health
- Local environmental health
- County sheriff's department
- Local law enforcement
- Local animal control

In addition, most counties responded that depending upon the circumstances of the exposures, they may allow animal owners to conduct in-home quarantines but also mandate out-of-the-home quarantines as well. Some of the factors they use to determine which type of quarantine to mandate include:

In-Home Quarantine:

- Animal's rabies vaccinations are current
- Owners are cooperative and seem trustworthy

- Owners have the ability to confine animal to the property to prevent escape or exposure to other humans or animals. Such as leash control or fenced yard.

Many counties also have processes in place to follow-up with the owner at the end of 10 days:

- Some counties require the owner to schedule a veterinary visit at the end of 10 days so that the veterinarian can verify that the animal is alive and is not showing symptoms that could be consistent with rabies.
- In other counties, public health, environmental health, or law enforcement will visit the home to make sure the animal is still alive and is not showing clinical symptoms.
- Several counties also indicated that they call the owner at the end of the 10 days to verify verbally that the animal is alive and not showing clinical signs.

<u>Out-of-the-Home Quarantine:</u>

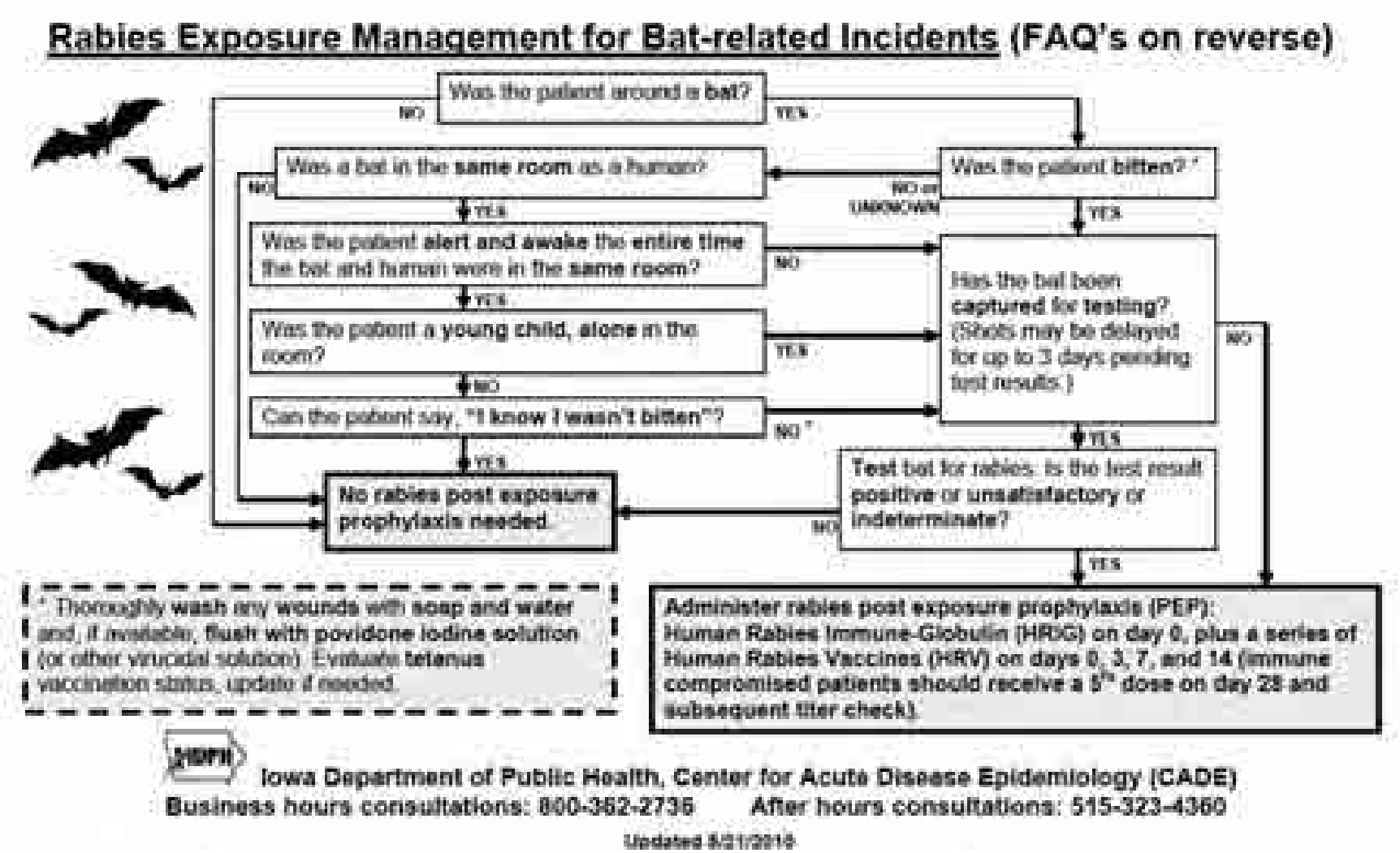
- Not current on rabies vaccinations
- Owners are not cooperative
- Owners do not have the ability to satisfactorily confine the animal

Most counties responded that when they mandate out-of-the-home quarantines, the animals are typically housed in one of the following:

- A local animal shelter or humane society, with which the county holds a contract for service.
- A local veterinary clinic, with which the county holds a contract for service.

Most counties responded that expenses related to the quarantine and / or testing of owned animals were the responsibility of the animal owner. Expenses accrued during the quarantine and / or testing of stray animals were the responsibility of the local board of health in most counties.

V. Exposure flow charts (all mammals and bats)



Recommendations for Managing Human Rabies Exposure*

*For **Bat** Exposures see Rabies Exposure Management for Bat-related Incidents Flow Chart, available at* [illegible]

Animal Species	Situation	Rabies Post Exposure Prophylaxis (PEP) Recommendations
Dogs, cats, ferrets	Animal available for testing or 10 day confinement and observation	If the animal is exhibiting symptoms consistent with rabies, immediately euthanize and test. If the animal is not exhibiting symptoms, a 10 day confinement period can be instituted. If the animal exhibits signs of rabies during the 10 day confinement period, it should be euthanized immediately and tested. If results are positive, unsuitable or indeterminate administer PEP immediately. If the animal does not exhibit clinical signs during the 10 day confinement period, PEP is not recommended, since the animal was not excreting virus at the time of the bite or saliva exposure.
	Animal unavailable (waiting up to 72 hours to capture the animal may be reasonable, assuming the correct animal can be identified)	If the animal is not available for confinement or testing, administer PEP. (If the animal is captured later contact IDPH at 800-362-2736.)
Horses or other farm animals	If the animal exhibits signs of rabies or dies suddenly, test the animal for rabies.	Defer administration of PEP until outcome of testing. If results are positive, unsuitable or indeterminate, administer PEP.
	All other cases, contact IDPH for guidance.	Contact IDPH at 800-362-2736 during business hours or 515-323-4360 after hours.
Skunk, raccoon, fox, coyote	Euthanize and test animal	Defer administration of PEP until outcome of testing. If results are positive, unsuitable or indeterminate administer PEP.
	Animal unavailable for testing	Administer PEP immediately.
Large rodents: such as beavers, muskrats, or groundhogs	Euthanize and test animal	Defer administration of PEP until outcome of testing. If results are positive, unsuitable or indeterminate administer PEP.
	Animal unavailable for testing	Contact IDPH for consultation at 800-362-2736 during business hours or 515-323-4360 after hours.
Small rodent: such as squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, rabbits, or opossum	Provoked bite and animal behaving normal	No PEP is recommended, as these species almost never carry rabies.
	Unprovoked bite or animal behaving abnormal	Contact IDPH for consultation at 800-362-2736 during business hours or 515-323-4360 after hours.

* Exposure: a bite or saliva/nervous tissue contact to an open wound or mucous membrane.

NOTE: If the patient was bitten above the shoulders, IDPH recommends that the health care provider consider starting PEP immediately. PEP can be discontinued if the animal tests negative for rabies or is healthy at the end of the quarantine period.

Thoroughly wash all wounds with soap and water and, if available, flush with povidone iodine solution (or other virucidal solution). Evaluate tetanus vaccination status, update if needed.

If questions arise on any of the above information or circumstances related to the exposure are unusual, please contact IDPH for consultation at 800-362-2736 during business hours or 515-323-4360 after hours.

For additional information, visit [illegible] (Updated 5/21/2010)

VI. Rabies Statistics

ANIMAL RABIES IN IOWA:

In 2009, 35 cases of animal rabies were reported in Iowa, which is a slight increase from 2008 (see Table 1 below). Rabies was identified most frequently in wildlife species including 13 skunks, 11 bats, and one squirrel. Five cases were diagnosed in domestic species including 3 cats and 2 dogs. Five cows tested positive.

Table 1: Positive Rabies Cases 2001-2009

Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Bat	31	27	47	47	60	28	13	11	11	**275**
Skunk	28	27	38	28	33	13	5	7	13	**192**
Cat	10	7	8	11	5	7	7	9	3	**67**
Cow	10	12	3	10	7	4	0	1	5	**52**
Dog	2	3	6	3	2	2	5	1	2	**26**
Horse	3	2	3	0	1	3	1	0	0	**13**
Fox	1	0	0	1	0	0	0	0	0	**2**
Squirrel	0	0	0	0	0	0	0	0	1	**1**
Badger	0	0	1	0	0	0	0	0	0	**1**
Total	**85**	**78**	**106**	**100**	**108**	**57**	**31**	**29**	**35**	**629**

As illustrated on the map below, cases were distributed across the state.

During 2009, 1694 animals in Iowa were tested for rabies and 35 were confirmed positive (2.07%). The percent positive varies greatly by species, see the Table 2 below. It is important to note that this data is greatly influenced by the number of animals tested. Many animals are tested because they exhibit unusual behavior or clinical signs making them more likely to be infected with the rabies virus. For these reasons, the percentages should not be considered representative of the true distribution of disease within the animal population in Iowa.

Table 2: Percent Positive by Species in 2009

Species	Positive	Total Tested	% Positive
Dogs	2	369	0.54%
Cows	5	86	5.81%
Cats	3	444	0.68%
Bat	11	558	1.97%
Squirrel	1	17	5.88%

Appendix 1:
SAMPLE: Rabies Exposure Investigation Protocol

In ***County/City X*** potential rabies exposures of humans, including those reported by the general public, health care providers, or veterinarians should be referred to:

Agency/Name: _____
Contact Information: _____
(For example: County Public Health/County Environmental Health/Sheriff's Department/Local Animal Control)

This entity serves as the **primary point of contact** for potential rabies exposures of humans. This primary point of contact will assess each potential rabies exposure individually. If the animal which potentially exposed the human is a dog, cat, or ferret, the primary point of contact will determine whether the animal should be quarantined in accordance with the *Compendium of Animal Rabies Prevention and Control, 2008*.

If it is determined that the animal should be quarantined, the primary point of contact will decide whether an in-home or out-of-the-home quarantine is most appropriate. The decision will be based upon several factors, including but not limited to the following.

In-Home Quarantines may be allowed under the following circumstances:

- If the animal is current its rabies vaccinations
- If the owners are cooperative and seem trustworthy
- If the owners have the ability to confine animal to the property.

Out-of-the-Home Quarantines may be required under the following circumstances:

- If the animal is not current on rabies vaccinations
- If the owners are not cooperative
- If the owners do not have the ability to satisfactorily confine the animal

At end of an in-home quarantine period, the primary point of contact will confirm that the animal is still alive and not showing symptoms of rabies infection by _____ *(veterinary confirmation is recommended).*

County/City X has an agreement with ***X veterinary clinic/ humane society/shelter*** to provide out-of-the-home quarantine services for ***stray and / or owned*** animals.

It is the responsibility of the animal owner to pay for any fees associated with animal quarantines and/or testing.

Expenses related to quarantine and/or testing of stray animals are the responsibility of _____ .

SAMPLE: RABIES EXPOSURE REPORTING FORM

REPORT:

Caller Name: _____
Caller Phone Number: _____
Relationship to Exposed Patient: _____

Completed by: _____
Date of Report: _____

PERSON EXPOSED:

First Name: _____
Last Name: _____
Age: _____ **Male:** ☐ **Female:** ☐
Street: _____
City: _____ State: _____
Zip: _____
Home Phone: _____
Alternate Phone: _____

Patient's Physician: _____
Clinic/Hospital: _____
Phone: _____
Is patient hospitalized? Y ☐ / N ☐
Other information: _____

Guardian: _____

DESCRIPTION OF EXPOSURE:

Exposure date: _____Time: _____
Street: _____
City: _____
County:_____ State: _____
Summary:_____
_____
_____
_____

Bite: Y☐ / N ☐
Bite Location: _____
Explain the Non-bite Exposure:_____
_____
_____
Were others exposed? Y ☐ / N ☐
- If yes, please list:_____

ANIMAL:

Species: _____
Wild ☐ **Stray** ☐ **Owned** ☐
If Applicable:
Breed: _____
Age: _____ Sex: _____
Current Rabies Vaccine: Y☐/N☐
Animal Owner Name:_____
Address: _____
City: _____
County: _____ State: _____
Owner Phone: _____

Owner's Veterinarian: _____
Clinic Name: _____
Clinic Address: _____
Clinic City: _____County:_____
Clinic Phone: _____

Is the animal available for testing? Y☐ / N☐
Is animal available for observation? Y☐ / N☐
Where is the animal now? _____

RECOMMENDATIONS:

Nothing- no exposure occurred ☐

Owner must confine animal in the home for 10 days (dogs, cats, ferrets only). If symptomatic euthanize and test, administer PEP based upon results ☐

Animal will be confined in the veterinary clinic/shelter for 10 days (dogs, cats, ferrets only). If symptomatic euthanize and test, administer PEP based upon results ☐
Shelter/clinic name and location _____

Euthanize animal and test immediately. Administer PEP based upon results ☐

Recommended patient consult their healthcare provider ☐

Bite above shoulders, give PEP immediately, discontinue if tests negative ☐

Recommended bat proofing ☐

Other: _____

Iowa Department of Public Health Rabies Consultation:
800-362-2736 or 515-323-4360 after hours

SAMPLE: Veterinary Certification Form

On *(date)*, I examined the following animal. Upon physical examination, the animal was not exhibiting clinical symptoms consistent with rabies virus infection.

Animal Name: _____

Species: _____

Owners Name: _____

Address: _____

City/State/Zip: _____

Phone: _____

Veterinarians Name: _____
Clinic Address: _____
Phone: _____
Signature: _____

Template developed by the Iowa Department of Public Health and the Iowa Veterinary Medical Association

Appendix 2: Clarification of Rabies Revaccination Requirements

(Source: Iowa Veterinary Medical Association Communiqué, Issued July, 2009)

Iowa law requires all dogs over six months of age to have a current rabies vaccination with a USDA-approved rabies vaccine. Canine rabies vaccination must be administered by a licensed veterinarian and the veterinarian is required to issue a tag and a certificate of vaccination. The tag is required to be attached to the collar of the dog. Iowa law also adds this exception "dogs kept in kennels and not allowed to run at large shall not be subject to the vaccination requirement."

Iowa law does not require rabies vaccination for cats. **Important note:** Local county and city ordinances may require vaccinations for cats and other animals. Local law takes precedence if it is more restrictive than state law. Rabies vaccination may be administered to cats, ferrets, livestock and other domestic animals for which there is an approved vaccine by non-veterinarians. Only a licensed, accredited veterinarian can issue and sign a rabies certificate.

Iowa law requires rabies vaccine frequency and procedure follow the recommendations from the Compendium of Animal Control prepared by the National Association of State Public Health Veterinarians.

Rabies revaccination

An initial rabies vaccine should be boostered in one year. At that point, Iowa law follows the vaccine manufacturer's recommendation for booster vaccination. If a 3 year vaccine is administered, the vaccine should be boostered prior to the 3 year expiration date. There are no studies available that indicate duration of immunity after administering a vaccination to a dog that has passed the three year expiration date. Therefore, because rabies is a zoonotic disease and nearly 100% fatal when contracted by humans, Iowa Department of Agriculture rules require a booster vaccine in one year if the 3 year vaccine has expired. The subsequent booster vaccine would expire in 3 years if a three year approved product is used. It has come to the attention of the IVMA that our members are recommending a number of different protocols for rabies revaccinations in a dog that has an expired three year vaccination. The IVMA recommends all veterinarians follow Iowa law and recommend a one year vaccination booster if an animals' three year vaccine has expired. Link to the Compendium for Animal Rabies Control: www.nasphv.org/Documents/RabiesCompendium.pdf

Appendix 3: Rabies Considerations with Animals in Public Settings

Source: Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2009 (*Morbidity and Mortality Weekly Report, May 1, 2009/Vol. 58/ No. RR-5)*

Exposure to Rabies

Certain venues encourage or permit the public to be in contact with animals, resulting in millions of human-animal interactions each year. These settings include county or state fairs, petting zoos, animal swap meets, pet stores, zoologic institutions, circuses, carnivals, educational farms, livestock birthing exhibits, educational exhibits at schools and child-care facilities, and wildlife photo opportunities. Although human-animal contact has many benefits, many human health problems are associated with these settings, including infectious diseases, exposure to rabies, and injuries. Although no human rabies deaths caused by animal contact in public settings have been reported, multiple rabies exposures have occurred, requiring extensive public health investigations and medical follow-up.

For example, thousands of persons have received rabies postexposure prophylaxis (PEP) after being exposed to rabid or potentially rabid animals, including bats, cats, goats, bears, sheep, horses, and dogs, at various venues: a pet store in New Hampshire, a county fair in New York State, petting zoos in Iowa, and Texas, school and rodeo events in Wyoming, a horse show in Tennessee, and summer camps in New York. Substantial public health and medical care challenges associated with potential mass rabies exposures include difficulty in identifying and contacting persons, correctly assessing exposure risks, and providing timely medical prophylaxis. Prompt assessment and treatment are critical to prevent this disease, which is usually fatal.

Recommendations:

Rabies: All animals should be housed to reduce potential exposure to wild animal rabies reservoirs. Mammals should also be up-to-date on rabies vaccinations. These steps are particularly critical in areas where rabies is endemic and in venues where animal contact is encouraged (e.g., petting zoos). Because of the extended incubation period for rabies, unvaccinated mammals should be vaccinated at least 1 month before they have contact with the public.

If no licensed rabies vaccine exists for a particular species (e.g., goats, swine, llamas, and camels) that is used in a setting where public contact occurs, consultation with a veterinarian regarding off-label use of rabies vaccine is recommended. Use of off-label vaccine does not provide the same level of assurance as vaccine labeled for use in a particular species; however, off-label use of vaccine might provide protection for certain animals and thus decrease the probability of rabies transmission. Vaccinating slaughter-class animals before displaying them at fairs might not be feasible because of the vaccine withdrawal period that occurs as a result of antibiotics used as preservatives in certain vaccines. Mammals that are too young to be vaccinated should be used in exhibit settings only if additional restrictive measures are available to reduce risks (e.g., using only animals that were born to vaccinated mothers and housed to avoid rabies exposure). In animal contact settings, rabies testing should be considered for animals that die suddenly.

Rocky Mountain Spotted Fever

Also known as: North American tick typhus, New World spotted fever, RMSF, Tick fever

Responsibilities:
Hospital: Report by IDSS, facsimile, mail, or phone
Lab: Report by IDSS, facsimile, mail, or phone
Physician: Report by facsimile, mail, or phone
Local Public Health Agency (LPHA): Report by IDSS, facsimile, mail, or phone. Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Rocky Mountain spotted fever (RMSF) is caused by the bacterium *Rickettsia rickettsii*.

B. Clinical Description

Initial Symptoms include moderate to high fever, nausea, vomiting, significant malaise, muscle pain, severe headache, chills, and eye inflammation.

Later Signs and Symptoms include rash, abdominal pain, joint pain, and diarrhea. Over half of cases develop a rash or small bruises on the arms and legs, which typically appears 3-5 days after the onset of illness. The rash spreads to the palms and soles, and then to much of the body. Among untreated individuals, these signs and symptoms typically persist for 2 - 3 weeks, and the case-fatality rate ranges from 13% - 25%. The classic triad of findings for this disease is fever, rash, and history of tick bite, but this combination is often not present when the patient initially seeks care.

Onset of RMSF is sudden.

Complications: More advanced manifestations include decrease in red blood cells (anemia) and platelets (thrombocytopenia), severe clotting disorders, involvement of the major organ systems, and shock. Severe cases can result in long-term neurological illness. If the disease is promptly recognized and treated, death is uncommon. For the United States, the reported case-fatality rate for RMSF has been 3% - 5% in recent years.

C. Reservoirs

The primary vector for RMSF is the tick, which also serves as a reservoir. Only members of the tick family Ixodidae (hard ticks) are naturally infected with *Rickettsia rickettsii*. Among ticks, *R. rickettsii* is spread through eggs, and between life stages. This species is maintained in nature by a complex cycle involving ticks and mammals; several small wild animals and dogs may develop antibodies to *R. rickettsii, but* their role as possible reservoirs in the maintenance of RMSF is uncertain. Humans are considered accidental hosts, and are not involved in the natural transmission cycle of this pathogen.

D. Modes of Transmission

RMSF is acquired from a tick bite. Laboratory data suggest that the tick must remain attached for

4 - 6 hours before transmission of *R. rickettsii* to occur. Less commonly, infections may occur following exposure to crushed tick tissues, fluids, or tick feces when these fluids get into cuts or scratches.

E. Incubation Period

Signs of RMSF typically develop one week after exposure (range 3 - 14 days). The length of the incubation period is associated with the magnitude of exposure to *R. rickettsii*.

F. Period of Communicability or Infectious Period

RMSF is not communicable from person to person.

G. Epidemiology

RMSF is a seasonal disease, occurring throughout the United States during the months of April through September, when the risk of contact with ticks is most likely. RMSF is uncommon in Iowa. The risk of mortality from RMSF is higher for men, people over the age of 40, non-whites, and individuals who do not develop (or recognize) the typical rash. Two-thirds of RMSF cases occur in children under the age of 15 years as they tend to spend more time in tick-infested areas. While rare, accidental transmission in the laboratory setting has been reported.

The incidence of RMSF has increased during the last decade, from less than 2 cases per million persons in 2000 to over 8 cases per million persons 2008. During the same time period, the proportion of RMSF cases resulting in death (case fatality) has declined to a low of less than 0.5%.

H. Bioterrorism Potential

None

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify where RMSF occurs in Iowa, and to recognize changes in disease incidence in the state.
- To focus preventive education, and to target tick control measures.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. After completing the investigation and gathering the information to complete the report form, enter the information into the Iowa Disease Surveillance System (IDSS), or FAX the report form with supporting laboratory documentation as follows: The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, or mail (in an envelope marked “Confidential”) to IDPH/CADE mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Laboratory Testing services Available

The University of Iowa State Hygienic Laboratory (SHL) tests single serum samples for *R. rickettsii* utilizing Indirect Fluorescence Antibody tests. Laboratory confirmation involves a single IFA serological titer of ≥1:64. The State Hygienic Laboratory will identify ticks potentially carrying *R. rickettsii*. For more information on either sera or tick specimen submission, call the SHL at (319) 335-4500.

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. The LPHA is responsible for completing the case investigation form in IDSS by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the case's healthcare provider or the medical record.

b. Use the following guidelines in completing the IDSS form:

1) Accurately record demographic information, occupation, whether hospitalized (including location and associated dates), date of symptom onset, symptoms, laboratory information, treatment information, healthcare provider information, and disease outcome (*e.g.,* recovered, died).

2) Exposure history: Use the incubation period range for Rocky Mountain spotted fever (3-14 days). Specifically, focus on the period beginning a minimum of 3 days prior to onset and ending no more than 14 days before onset for the following exposures:

a) Determine if a tick bit the case. If yes, record information about the duration of tick attachment, date(s) and geographic location(s) where the bite occurred.

b) Travel history: Determine the geographic area(s) visited by the case.

3) If the patient was diagnosed at the same time with another tick-borne disease (such as Lyme disease, ehrlichiosis, or babesiosis) please refer to other chapters in this manual and complete the appropriate IDSS case report forms.

4) If several unsuccessful attempts have been made to obtain case information (the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), complete the IDSS form with as much information as possible. Make notations in IDSS "Notes" why any information is incomplete. If unable to get information, in IDSS select the appropriate reason under the Event tab in the Event Exception field.

If assistance is needed, contact CADE at (800) 362-2736; epidemiologists are available to answer questions about completing a case investigation.

c. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

None.

D. Preventive Measures

Environmental Measures

Provide individuals the following information: Prevention of Rocky Mountain spotted fever involves making one's property less attractive to ticks.

- Remove leaf litter and brush from around the home.
- Mow lawns regularly, and prune low-lying bushes to let in more sunlight.
- Keep woodpiles in sunny areas off the ground.
- If insecticides are used around the home, always follow the label instructions. Never use near streams or other bodies of water.

Personal Preventive Measures/Education

The best preventive measure is to avoid tick-infested areas. In areas where contact with ticks may occur, individuals should be advised of the following:

- Wear long-sleeved shirts and long, light-colored pants tucked into socks or boots to make it easier to see ticks crawling on your clothing, and to prevent ticks from crawling up the inside of the pants legs.
- Stay on trails when walking or hiking.
- Use insect repellants properly. Repellants that contain DEET (diethyltoluamide) should be used in concentrations no higher than 30% for children. Remember, repellants should *never* be used on infants. Permethrin is a repellant that can be applied only to clothing, *not* exposed skin.
- After each day spent in a tick-infested area, thoroughly check yourself, children, and pets for ticks. Remove any tick found on the body. Clothing should also be checked.
- Promptly remove any attached tick using fine-point tweezers. The tick should not be squeezed or twisted, but grasped close to the skin and pulled straight out with steady pressure. Once removed, the tick should be drowned in rubbing alcohol or the toilet.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Rocky Mountain Spotted Fever can be found at:
www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.
Beran, G.W. *Handbook of Zoonoses, 2nd Edition, Section A: Bacterial, Rickettsial, Chlamydial, and Mycotic*. Boca Raton, CRC Press, 1994.
Heymann, David L., ed., *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

Resources

www.cdc.gov/ticks/diseases/rocky_mountain_spotted_fever/

FACT SHEET

Rocky Mountain Spotted Fever

(RMSF, tick fever)

What is Rocky Mountain spotted fever?
Rocky Mountain spotted fever (RMSF) is a disease caused by a bacterium *spread by ticks*. It is uncommon in Iowa. Most people with RMSF become ill between April and September.

Who gets RMSF?
Anyone can get RMSF, especially people who spend a lot of time outdoors in areas where ticks are found.

How is RMSF spread?
RMSF is acquired from the bite of an infected tick. Less commonly, people become ill after crushing a tick with their hands, because its body fluids get into cuts or scratches. RMSF cannot be spread from person to person.

What are the symptoms of RMSF?
RMSF usually causes a sudden high fever that may last 2 - 3 weeks if untreated. Fevers of 105-106^{o} F are common. Severe headache, rash, abdominal pain, joint pain, diarrhea, and muscle aches may also occur.

How soon do symptoms appear?
Symptoms typically develop 5 - 10 days after the tick bite. Not everyone who is infected develops a rash.

What is the treatment for RMSF?
Antibiotics such as tetracycline, doxycycline or chloramphenicol are used to treat RMSF.

Can a person get RMSF more than once?
Probably not.

How should a tick be removed?
Any tick should be removed as soon as possible. The best way is to use tweezers to grab the tick as close to the skin as possible and pull it straight out. Do not squeeze the tick's body when removing it. Do not handle ticks with bare hands. Wash your hands after removing a tick. Apply an antiseptic on the bite.

How can RMSF be prevented?

1. Do not walk bare-legged in tall grass or woods where ticks are found.
2. Wear a long-sleeved shirt, long pants, and high socks. Tuck pants legs into socks. Wear light-colored clothing so crawling ticks can be seen more easily.
3. Conduct "tick checks" every two or three hours if spending a lot of time outdoors. Check all of your skin for ticks every day (you may need help to do this). Ticks are most often found on the thighs, arms, underarms, and legs. Parents should check children for ticks, especially in the hair, when returning from potentially tick-infested areas. Ticks may be carried into the household on clothing and pets. Both should be examined carefully.
4. Use tick repellents containing DEET for skin applications (using a lower concentration on children, but applying more often) or permethrin (apply to clothing). Always follow directions on the can. Wash off all repellents after going indoors.
5. Remove any attached ticks immediately, using the method above.

Rocky Mountain Spotted Fever

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name: Facility phone: ( )- - Type:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Onset date: / / Diagnosis date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider type: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Rickettsia rickettsii***

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Rickettsia rickettsii***

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Rickettsia rickettsii***

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Fever: ☐ Yes ☐ No ☐ Unk Onset Date: / / Duration (days): _____ Highest known fever: _____ °F/C

Other symptoms:
☐ Anemia
☐ Fatigue
☐ Headache
☐ Muscle pain
☐ Nausea
☐ Rash
☐ vomiting

Life threatening complications:
☐ Adult respiratory distress syndrome
☐ Disseminated intravascular coagulopathy
☐ Meningitis/Encephalitis
☐ Renal failure

The following questions are relevant for Lyme disease only.

Did the health care provider for the case diagnose Lyme disease? ☐ Yes ☐ No ☐ Unk

Erythema migrans diagnosed by physician present: ☐ Yes ☐ No ☐ Unk Onset Date: / / Lesion greater than or equal to 5 cm: ☐ Yes ☐ No ☐ Unk

Late manifestations:
☐ 2nd/3rd degree atrioventricular (AV) block
☐ Bilateral facial palsy
☐ Encephalitis/Encephalomyelitis
☐ Cranial neuritis
☐ Recurrent, brief attacks of joint swelling
☐ Lymphocytic meningitis
☐ Radiculoneuropathy

OTHER LAB FINDINGS

Higher antibody result in CSF than in serum: ☐ Yes ☐ No ☐ Unknown
Leukopenia: ☐ Yes ☐ No ☐ Unknown
Thrombocytopenia: ☐ Yes ☐ No ☐ Unknown
Elevated hepatic transaminases: ☐ Yes ☐ No ☐ Unknown

TREATMENT

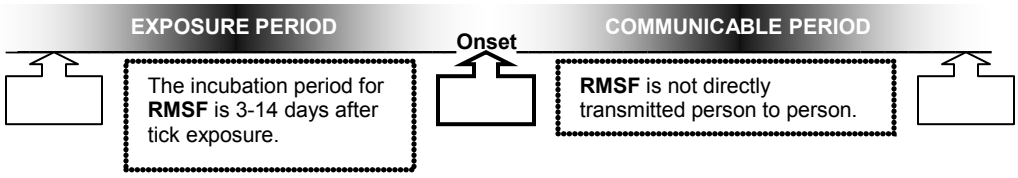
Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of times a day: Route:	# of times a day: Route:	# of times a day: Route:

Therapeutic medications prescribed: ☐ Yes ☐ No ☐ Unknown List medications:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Did the case spend time in a wooded, brushy, or grassy area within 14 days of the onset of symptoms?

Location name: _____

Address: _____

City/State/County: _____ Zip: _____ Is Lyme disease endemic in this county? ☐ Yes ☐ No ☐ Unk

Location name: _____

Address: _____

City/State/County: _____ Zip: _____ Is Lyme disease endemic in this county? ☐ Yes ☐ No ☐ Unk

In the 14 days prior to onset of symptoms did the case find a tick on his/her body? ☐ Yes ☐ No ☐ Unk Date found: / /

NOTES:

RUBELLA

Also known as German Measles or Three-Day measles

Responsibilities:
Hospital: Report by IDSS, mail, facsimile or phone
Lab: Report by IDSS, mail, facsimile, or phone
Physician: Report by mail, facsimile, or phone
Local Public Health Agency (LPHA): Report by IDSS, mail, facsimile or phone. Follow-up required.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Rubella is caused by rubella virus (genus *Rubivirus*, family *Togaviridae*).

B. Clinical Description

When contracted after birth, rubella is usually a mild disease characterized by a generalized maculopapular rash, swollen lymph nodes, and slight fever. Transient inflammation of the joints rarely occurs in children, but is common in adolescents and adults, especially women (up to 70%). Encephalitis occurs (1 per 5,000 cases, more frequently in women) and hemorrhagic manifestations (1 per 3,000 cases, more often in children) are rare complications. Up to 50% of infections occur without recognized rash.

Rubella is of greatest danger to the fetus. Up to 90% of infants born to mothers infected in the first trimester will develop the physical anomalies referred to as congenital rubella syndrome (CRS). CRS is characterized by complications, which include blindness, heart defects, deafness, behavioral disorders, mental retardation, growth retardation, bone disease, enlarged liver and spleen, thrombocytopenia, and purple skin lesions. Some effects may not be apparent at birth.

Reinfection has been demonstrated on rare occasions, but only very rarely has resulted in CRS.

Clinical Case Definition

- Acute onset of generalized maculopapular rash
- Temperature >37.2°C (99°F), if measured
- Arthralgia/arthritis, or lymphadenopathy, or conjunctivitis
- Serologic confirmation (IgM or 4-fold increase in IgG)

Clinical diagnosis is UNRELIABLE. Serologic confirmation is critical.

Case Classifications

Suspected. A case of any generalized rash illness of acute onset.

Probable. A case that meets the clinical case definition, has noncontributory or no serologic or virologic testing, and is not epidemiologically linked to a laboratory confirmed case.

Confirmed. A case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a laboratory confirmed case.

C. Reservoirs

Humans are the only known host.

D. Modes of Transmission

Rubella is transmitted person-to-person by droplet or direct contact with the nasopharyngeal secretions of an infected person or with the nasopharyngeal secretions or urine of an infant with CRS.

E. Incubation Period

The incubation period is usually 14 -17 days, with a range of 14–21 days.

F. Period of Communicability or Infectious Period

The infectious period is usually from 7 days before to at least 4 days after rash onset. Infants with CRS shed virus in nasopharyngeal secretions and urine for a longer period; a small proportion of them continue to be infectious for 1 year or more.

G. Epidemiology

Rubella occurs worldwide. In the temperate zones, peak incidence is in late winter and early spring. Before the widespread use of rubella vaccine, which was licensed in 1969, peaks of rubella incidence occurred in the United States every 6–9 years, and most cases occurred in children. Now that children are well immunized, most cases have occurred in young, unvaccinated adults in college and occupational settings. Recent serologic surveys indicate that about 10% of young adults are susceptible to rubella.

In recent years in the U.S. and Iowa, outbreaks have occurred among immigrant populations due to lack of rubella vaccination programs in their countries of origin. Outbreaks occur predominately in workplaces and communities at large. CRS disproportionately affects infants born to foreign-born women. The last case of Rubella reported in Iowa was in 2001.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of surveillance and reporting

- To identify all cases and susceptible exposed people and to prevent further spread of infection, especially to pregnant women.
- To ensure appropriate management of exposed pregnant women and their babies.
- To monitor the effectiveness of outbreak control strategies.
- To identify cases of congenital rubella infection or syndrome that may occur after a cluster or outbreak of rubella.

B. Laboratory and Healthcare Provider Reporting Requirement

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

What to Report to the Iowa Department of Public Health

- A case of rash illness accompanied by fever, or
- A suspect case of rubella (with or without fever), as diagnosed by a healthcare provider; ***or***
- Positive serologic test for rubella IgM; or
- Significant rise between acute and convalescent phase titers in serum rubella IgG *or* total antibody level by any standard serologic assay; or
- Isolation of rubella virus from a clinical specimen.
- A suspect or confirmed case of congenital rubella syndrome (CRS) in a child (usually a baby), as diagnosed by a healthcare provider (the CRS case definition appears under "Additional Information" at the end of this chapter).

Laboratory Services Available

1. Serologic Testing for Non-Congenital Rubella
    - **Rubella IgM test:** False positive rubella IgM results can occur in persons with parvovirus infection, infectious mononucleosis, or rheumatologic disease. IDPH recommends submission of specimens to the State Hygienic Laboratory (SHL) for testing. The specimen should be drawn **NO** earlier than 3 days after onset of rash, to minimize the possibility of false negative results. It can be drawn as late as 6 weeks after the onset of the rash. (If serum is collected prior to the third day and tests are negative, a follow-up specimen may be requested.).

    - **Rubella total antibody paired-titer test:** Testing for rubella IgM is greatly preferred because it provides an earlier result. However, SHL also performs a paired titer test. Acute serum (IgM) should be collected 7-10 days after onset of rash. Convalescent serum (IgG) should be collected 14 days later.

    - **Shipment of sera:** SHL will conduct the IgM testing for rubella and measles at no charge. Please request IgM testing for measles and rubella. Contact the virus-serology laboratory at (319) 335-4277. Transport via courier may be arranged, if possible.

    - If sera must be shipped, send it overnight by Federal Express to the following address:

      State Hygienic Laboratory
      Virus-Serology Laboratory
      102 Oakdale Campus, #H101 OH
      Iowa City, IA 52242-5002

    - For more information, visit: www.shl.uiowa.edu/

C. Local Public Health Agency Roles and Control Measure Responsibilities

1. Implement control measures before serologic confirmation. This is especially important in settings involving pregnant women (obstetric-gynecologic and prenatal clinics).
2. Isolate case during infectious period as defined above.
    - The individual must stay home during infectious period; if hospitalized, the patient must be placed in droplet isolation for seven days after the onset of rash.

- For congenital rubella, place infant in Contact Precautions during any admission until 1 year old, unless nasopharyngeal and urine cultures are negative for virus after the age of 3 months.

3. In order to identify those exposed, identify "zones of exposure" such as place of work (including sites which employ individuals from other countries where rubella is prevalent), school, family, child care, etc.
4. Identify high-risk susceptibles that the index case has had contact with during infectious period.
    - Immunocompromised individuals should be referred to their physicians.
5. Identify susceptibles. These are individuals without proof of immunity.

PROOF OF IMMUNITY TO RUBELLA[1]
• Documentation of rubella vaccination on or after the first birthday, **unless** pregnant. • Serologic proof of immunity.[2]
[1] Remember, persons born outside the US (without written proof of immunity) are more likely to be susceptible, especially if they have been in the US for only a short time. [2] **Documentation of serologic evidence of immunity is the only acceptable proof of immunity for pregnant women.**

Physician-diagnosed disease or born before 1957 is not acceptable proof of immunity.

6. Immunize all susceptibles for whom it is not contraindicated, keeping in mind the following:
    - Rubella containing vaccine will not prevent development of disease after infection.
    - Vaccinating an individual who may be incubating rubella is not harmful.
7. Child care and school settings:
    - Determine if there are any susceptible:
        a. Pregnant teachers, staff, volunteers, student teachers, or students.
        b. Immunocompromised individuals.
        c. Medical/religious vaccine exemptions anywhere in the classroom or school of the suspected case.
    - These individuals, if medically appropriate, should be encouraged to receive vaccine and may self exclude during the time frames described above.

D. Initial Questions to Ask Healthcare Provider and Patient

In order to assess the likelihood that a suspect case is a true case prior to laboratory testing, IDPH and/or LPHA staff conducting the investigation should ask about:

- Symptoms
- Rubella immunization history
- Country of origin and length of residence in US
- Recent travel history (location and dates)
- Whether there were any recent out-of-town visitors location and dates)
- Whether there was any recent contact with anyone with similar symptoms

2) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Current recommendations of CDC and IDPH are as follows:

Non-congenital rubella:

Minimum Period of Isolation of Patient
7 days after onset of rash.

Minimum Period of Quarantine of Contact

Healthcare workers who are not appropriately immunized or do not have serologic evidence of immunity will be excluded from work from day 7 through day 21 after their last exposure. When multiple cases occur, susceptibles need to be excluded until 21 days after the onset of the last case at the workplace.

Congenital rubella:

Minimum Period of Isolation of Patient

Isolation from susceptible persons for the first year of life or until two cultures of clinical specimens (nasopharyngeal secretions or urine) obtained 1 month apart after 3 months old are negative for rubella virus. Household and other contacts should be adequately immunized.

Minimum Period of Quarantine of Contacts

No restrictions except for susceptibles. Same as for non-congenital rubella, above.

B. Protection of Contacts of a case

C. Managing Special Situations

Control guidelines for three situations ---**1**) rubella in healthcare facilities, **2**) when a pregnant woman has been exposed, and **3**) infants with CRS—are presented below. Note that these situations are not mutually exclusive.

Situation 1: Rubella in healthcare facilities

If a confirmed or suspect case of rubella has visited a healthcare facility during his/her infectious period, contact the infection prevention staff and go over the following recommendations with them:

1. **Identify all susceptible high-risk patients, volunteers and staff exposed to the rubella case.** Pregnant women and immunosuppressed individuals should be referred to their healthcare providers to determine if they are immune.
   Pregnancy and Immune Globulin. Routine use of IG for postexposure prophylaxis is not recommended, even for susceptible pregnant women, because IG does not guarantee prevention of fetal infection. The only time IG may be considered is when exposure occurs early in pregnancy and termination is not an option.
2. **Identify all other susceptible exposed patients and staff at the facility.** Primary care providers of exposed infants should be notified. Proof of immunity is defined as:

PROOF OF IMMUNITY TO RUBELLA[1]
• Documentation of rubella vaccination on or after the first birthday, • Serologic proof of immunity.[2]
[1] Remember, persons born outside the US (without written proof of immunity) are more likely to be susceptible, especially if they have been in the US for only a short time. [2] Documentation of **serologic evidence of immunity is the only acceptable proof of immunity for pregnant women.**

3. **Notify healthcare providers of all exposed patients.**
4. **Immunize all susceptible patients and staff.** Live-virus rubella vaccine given after exposure has not been demonstrated to prevent illness, but theoretically could prevent illness if administered within 3 days of exposure. All susceptibles who are $\geq$12 months old (and for whom it is not contraindicated) should receive rubella vaccine given as the combined formulation of measles, mumps, rubella (MMR) vaccine.

Previous administration of human anti-Rho(D) immune globulin (RhoGam) does not generally interfere with an immune response to rubella vaccine. However, women who have received anti-Rho immune globulin should be serologically tested 6–8 weeks after vaccination to assure that seroconversion occurred. If other antibody-containing blood products are needed for other reasons, they should be administered at least 2 weeks before and deferred for up to 11 months after administration of MMR vaccine. (Refer to General Recommendations on Vaccination at: www.cdc.gov/vaccines/hcp/acip-recs/index.html

5. **Exclude susceptible staff.** Ideally, all hospital employees should be immune. It is important to note that screening programs alone are not adequate. Vaccination of susceptible hospital personnel, both male and female (e.g., volunteers, trainees, nurses, physicians) must follow. Unlike measles, vaccinating immediately postexposure does not prevent an individual from acquiring rubella. Therefore, all susceptible individuals without proof of immunity, including those just vaccinated, can become infectious and must be excluded on days 7 through 21 postexposure. They may return on the 22nd day. If additional cases occur, the exclusion period may need to be extended.
6. **Isolate susceptible patients and suspect/confirmed cases**. Susceptible patients ≥12 months of age should be vaccinated and placed on Droplet Precautions for days 7–21 after exposure. They may be taken off precautions on the 22nd day. All suspect and confirmed cases should be placed on Droplet Precautions during their infectious period. The infectious period for rubella is 7 days before rash onset through 7 days after rash onset.
7. **Conduct surveillance** for two incubation periods (46 days) after the last exposure in the facility, and report all suspect cases of rubella to the Iowa Department of Public Health at (800) 362-2736.
8. **Place any new cases of rash illness on Droplet Precautions or exclude for 7 days after rash onset.** A blood specimen should be obtained 3 days after rash onset and sent to SHL. New cases should be **reported** to the Iowa Department of Public Health.

Situation 2: Pregnant women who might have been exposed to Rubella

All exposed pregnant women should be screened to determine if they:

1. were infected during pregnancy,
2. are susceptible or
3. were immune before pregnancy.

Because of the seriousness of CRI, immunity must be documented by a verified, dated record of a positive serologic test. Pregnant women without documented immunity should be tested for the presence of rubella IgG and IgM antibodies as outlined in this section. Identifying susceptible pregnant women is critical, so they can be isolated from further exposure, monitored for infection, and vaccinated postpartum. Pregnant women with evidence of infection during pregnancy should be evaluated to verify rubella infection and determine gestational age at time of infection, if possible, to assess the possibility of risk to the fetus.

Regardless of the point in pregnancy in which the exposure occurred (because of the possibility of late effects), and *regardless* of whether the woman had symptoms of rubella (because of the high proportion of asymptomatic infections). Diagnostic testing of the baby will be necessary if rubella infection in the mother was not reliably ruled out, as reflected below:

	Pregnant woman's lab results		
Possible conclusions	Rubella IgM-neg. and no rise in IgG	Rubella IgM-pos. or significant rise in IgG	Maternal infection neither confirmed nor ruled out prior to delivery
Woman infected?	No	Yes	Unknown
Need to follow baby?	No	Yes—see Attachment A	Yes—see Attachment A

Situation 3: Infants with CRS

In cases of suspect or confirmed CRS in an infant, contact the infection prevention staff in any facility in which the infant was seen, as well as care providers of the mother and the infant and review the following recommendations with them:

1. **Immediately place all suspect cases of CRS on Contact Precautions**. Infants with CRS shed virus in their urine and nasopharyngeal secretions and can remain infectious for 1 year or more after birth. Both the American Academy of Pediatrics in the *Red Book* and the Centers for Disease Control and Prevention (CDC) in the *CDC Guidelines for Isolation and Precautions in Hospitals* recommend Contact Precautions.
2. **Place all suspect cases of rubella on Droplet Precautions** during their infectious period. The infectious period for rubella is from 7 days before until 7 days after rash onset.
3. **Identify all high-risk patients and staff exposed** to the CRS and/or rubella case(s). Pregnant women and immunosuppressed individuals should be referred to their healthcare providers to determine if they are immune.
4. **Pregnancy and Immune Globulin.** Routine use of IG for postexposure prophylaxis is not recommended, even for susceptible pregnant women, because IG does not guarantee prevention of fetal infection. The only time IG may be considered is when infection occurs early in pregnancy and termination is not an option.
5. **Identify all other susceptible exposed patients and staff at the facility.** Healthcare providers of exposed infants should be notified. If a baby with CRS has been in a nursery where visitors and other family members have spent significant amounts of time, the immunity of those exposed to the baby should be evaluated. Proof of immunity is defined below:

PROOF OF IMMUNITY TO RUBELLA[1]
• Documentation of rubella vaccination on or after the first birthday. • Serologic proof of immunity.[2]
[1] Remember, persons born outside the US (without written proof of immunity) are more likely to be susceptible, especially if they have been in the US for only a short time. [2] Documented s**erologic evidence of immunity is the only acceptable proof of immunity for pregnant women.**

6. **Notify healthcare providers of all exposed patients.**

7. **Immunize all susceptible patients and staff.** Live-virus rubella vaccine given after exposure has not been demonstrated to prevent illness, but theoretically could prevent illness if administered within 3 days of exposure. All susceptibles who are $\geq$12 months old (and for whom it is not contraindicated) should receive rubella vaccine given as the combined formulation of measles, mumps, rubella (MMR) vaccine.

   Previous administration of human anti-Rho(D) immune globulin (RhoGam) does not generally interfere with an immune response to rubella vaccine. However, women who have received anti-Rho immune globulin should be serologically tested 6–8 weeks after vaccination to assure that seroconversion occurred. If other antibody-containing blood products are needed for other reasons, they should be administered at least 2 weeks before and deferred for up to 11 months after administration of MMR vaccine.
8. **Exclude susceptible staff.** Unlike measles, vaccinating immediately postexposure does not prevent an individual from acquiring rubella. Therefore, all susceptible individuals without proof of immunity, including those just vaccinated, can become infectious and must be excluded on

days 7 through 21 postexposure. They may return on the 22nd day. If additional cases occur, the exclusion period may need to be extended.

9. **Isolate susceptible patients and suspect/confirmed cases**. Susceptible patients ≥12 months old should be vaccinated and placed on Droplet Precautions for days 7–21 after exposure. They may be taken off precautions on the 22nd day. All suspect and confirmed cases should be placed on Droplet Precautions during their infectious period. The infectious period for rubella is 7 days before until 7 days after rash onset.
10. **Collect specimens for diagnostic testing on infants with suspect CRS and their mothers.**
11. **Conduct surveillance** for two incubation periods (46 days) after the last exposure in the facility, and report all suspect cases of rubella to IDPH (800) 362-2736.
12. **Take the opportunity to review the facility's policy on post-partum immunization of susceptible women.** Birthing facilities should be encouraged to adopt a policy of routine post-partum vaccination.

D. Preventive Measures

Vaccination, including routine childhood vaccination, catch-up vaccination of adolescents, and targeted vaccination of high-risk adult groups (such as international travelers and adults born outside the US), is the best preventive measure. Workers born outside the United States are a potentially susceptible population in which outbreaks may occur after importation of the virus from areas where rubella is endemic. Vaccinating against rubella in workplaces is a strategy to reach this susceptible population and can be a critical step in eliminating indigenous rubella.

The continuing occurrence of rubella among women of childbearing age indicates the need to continue vaccination of susceptible women in this age group. The absence of evidence of vaccine teratogenicity suggests that the practice is safe. Vaccination of susceptible women of childbearing age should:

- be part of routine general medical and gynecological outpatient care;
- take place in all family-planning settings; and
- be provided routinely before discharge from any hospital, birthing center, or other medical facility, unless a specific contraindication exists. (*Note:* Previous administration of human anti-Rho(D) immune globulin (RhoGam) does not generally interfere with an immune response to rubella vaccine. However, women who have received anti-Rho immune globulin should be serologically tested 6–8 weeks after vaccination to assure that seroconversion occurred.)

Rubella Vaccination of women of childbearing age:

Women who are pregnant or who intend to become pregnant within 4 weeks should not receive live rubella or MMR vaccine. The Advisory Committee on Immunization Practices (ACIP) recommends that vaccine providers ask a woman if she is pregnant or likely to become pregnant in the next 4 weeks. Those who are pregnant or intend to become pregnant should not be vaccinated. All other women should be vaccinated after being informed of the theoretical risks of vaccination during pregnancy and the importance of not becoming pregnant during the 4 weeks following vaccination. ACIP does not recommend routine pregnancy screening of women before rubella vaccination.

Please refer to the most current versions of the ACIP statement on measles, rubella, and mumps (listed under References, below), IDPH's Immunization Guidelines, and IDPH's Iowa's Vaccine for Children Program Eligibility Criteria for details about MMR vaccine, the recommended schedule, who should and shouldn't get the vaccine, and who is eligible to receive state-supplied vaccine. These, as well as other relevant resources, are available through the IDPH Clearinghouse at (319) 398-5133 or visit: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Rubella can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

Advisory Committee on Immunization Practices. Measles, Mumps, and Rubella Vaccine Use and Strategies for Elimination of Measles, Rubella, and Congenital Syndrome and Control of Mumps, May 22, 1998.

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MDPH. *Regulation 105 CMR 300.000: Reportable Diseases and Isolation and Quarantine Requirements.* MDPH, Promulgated November 1998 (Printed July 1999).

MDPH. *The Comprehensive School Health Manual*. MDPH, 1995.

Ray, P., Black, S., Shinefield, H., *et al*. Risk of chronic arthropathy among women after rubella vaccination. Vaccine Safety Datalink Team. *JAMA.* 1997; 278:551–556.

CDC, Control and Prevention of Rubella: Evaluation and Management of Suspected Outbreaks, Rubella in Pregnant Women, and Surveillance for Congenital Rubella Syndrome. MMWR 2001; 50:RR-12.

CDC, Epidemiology and Prevention of Vaccine Preventable Diseases 9th Edition (Pink Book) January 2006 www.cdc.gov/vaccines/pubs/pinkbook/rubella.html

Resources

CDC Disease Surveillance Manual: www.cdc.gov/vaccines/pubs/surv-manual/chpt14-rubella.html

FACT SHEET

RUBELLA
(German Measles)

What is rubella?
Rubella, also called German measles, is a contagious disease that usually causes a red rash that spreads over most of the body. While rubella is generally a mild illness, if it infects pregnant woman, particularly early during pregnancy, it can result in congenital rubella syndrome and cause serious birth defects.

What are the symptoms of rubella?
In children, rash is usually the first symptom. In older children and adults, there is often a period of low-grade fever, swollen glands, cold-like symptoms, and tender joints before the rash appears.

How is rubella spread?
The germs that cause rubella live in the nose, mouth, and throat, and are sprayed into the air when an infected person sneezes, coughs, or talks. Other people nearby can then inhale the germs. The first symptoms may appear within 14 days after a person is exposed.

Who gets rubella?
Rubella is most common among preschool age children, but anyone can get it. Rubella can be hard to diagnose because some people do not have all of the symptoms. Vaccinated persons are almost always protected.

Is rubella dangerous?
Rubella is generally a mild disease but it is very dangerous to unborn babies if a woman is pregnant. Up to half of the women who catch rubella when they are pregnant will lose their babies or have babies born with heart disease, blindness, and deafness or have problems with learning.

How is rubella diagnosed?
A doctor may think a patient has rubella because of the symptoms, but a blood test is the only way to be sure that a person has rubella. A laboratory then tests the blood sample to determine whether the patient has rubella.

Can rubella be prevented?
Yes, there is a vaccine to prevent rubella. It is given along with measles and mumps vaccines in a single shot called MMR. Two doses of vaccine, given in a series usually starting at 12 months of age, are needed to protect a child from rubella. The vaccine is usually not recommended for children younger than 12 months old.

Is rubella vaccine safe?
Yes, it is safe for most people, but as with any medicine, there can be small risks that could occur after taking the vaccine. Most people who have problems with the vaccine may see soreness, redness, or swelling where the shot was given. Rarely, a person may have a rash, fever, swelling of the gland in the cheeks, neck or under the jaw, or have a seizure (caused by fever).

Where can you get more information?
The Iowa Department of Public Health, Immunization Program (800) 831-6293.

Rubella

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown Date of death / /
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Rubella virus

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Rubella virus

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Test type: _____

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Rubella virus

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms

Fever ☐ Yes ☐ No ☐ Unk Onset date: / / Duration: hrs/days Date returned to normal activities: / /

Cough ☐ Yes ☐ No ☐ Unk Onset date: / /

Runny nose ☐ Yes ☐ No ☐ Unk Onset date: / /

Red eyes w/t drainage ☐ Yes ☐ No ☐ Unk Onset date: / /

Diarrhea ☐ Yes ☐ No ☐ Unk Onset date: / /

Thrombocytopenia ☐ Yes ☐ No ☐ Unk Onset date: / /

Arthritis ☐ Yes ☐ No ☐ Unk Onset date: / /

Other symptoms

☐ Abdominal cramps
☐ Backache
☐ Chills
☐ Encephalitis
☐ Fatigue
☐ Fever
☐ Sore throat
☐ Vomiting
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Otitis media
☐ Photophobia

Other complications: _____ Describe: _____

Rash: ☐ Yes ☐ No ☐ Unk Onset date: / / Duration: hours/days

Fever continued w/t rash: ☐ Yes ☐ No ☐ Unk Rash spreading: ☐ Yes ☐ No ☐ Unk

Rash equally distributed: ☐ Yes ☐ No ☐ Unk Rash appeared at once: ☐ Yes ☐ No ☐ Unk

Lesions present: ☐ Yes ☐ No ☐ Unk Rash initial location: ☐ Arms ☐ Face ☐ Legs ☐ Trunk ☐ Inside mouth

cm Heaviest lesion area: ☐ Arms ☐ Face ☐ Legs ☐ Trunk ☐ Scalp

# of days for first lesion to crust: days Areas present: ☐ Inside mouth ☐ Palms ☐ Soles

Lesions in same stage of development: ☐ Yes ☐ No ☐ Unk Severity: ☐ < 50 lesions ☐ 50 – 249 lesions ☐ 250 – 500 lesions ☐ > 500 lesions

Rash characteristics:
☐ Burning ☐ Confluent lesions ☐ Could be felt (papule) ☐ Could not be felt (macule)
☐ Discrete lesions ☐ Distinct sharp borders ☐ Dusky brown ☐ Marked itching
☐ Numbness ☐ Painful ☐ Peeling skin ☐ Pustule
☐ Reddish ☐ Scaling/crusting

Koplik's spots: ☐ Yes ☐ No ☐ Unk

Healthcare provider visited: ☐ Yes ☐ No ☐ Unk Date(s) visited: / / , / / , / /

Swollen lymph nodes: ☐ Yes ☐ No ☐ Unk Location: _____

TREATMENT

Antivirals prescribed: ☐ Yes ☐ No ☐ Unknown

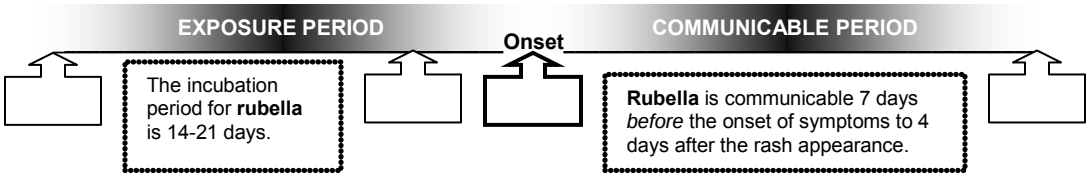
Antiviral:			
Date started:	/ /	/ /	/ /
Dose:			
Unit:	☐ mg ☐ ml ☐ IU	☐ mg ☐ ml ☐ IU	☐ mg ☐ ml ☐ IU
# of days:			
# of times a day:			
Route:			

Therapeutic medications prescribed? ☐ Yes ☐ No ☐ Unk

List medications: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated with MMR: ☐ Yes ☐ No ☐ Unknown

Date vaccinated:	/ /	/ /	/ /
Lot #:			
Vaccine type:			
Manufacturer:			

Number of vaccinations: ____

In the 21 days prior to the onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk City in Iowa: _____ Departure date: / / Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk State: _____ City: _____ Departure date: / / Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk Country: _____ Departure date: / / Return date: / /

Country outside the U.S.: _____

Born outside the U.S.? ☐ Yes ☐ No ☐ Unknown _____

Immunocompromised? ☐ Yes ☐ No ☐ Unknown

In the 7 days prior to the onset of rash through 4 days after the onset of rash did the case:

Use public transportation: ☐ Yes ☐ No ☐ Unk

Date(s) used:	Time(s) used:	Type:	Route:
/ /			
/ /			
/ /			

Visit a doctor's office, clinic or hospitals: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Facility name:				Facility name:			
Address:				Address:			
Zip code:		City:		Zip code:		City:	
State:		County:		State:		County:	
Phone:	( )- -	Type:		Phone:	( )- -	Type:	
Date visited:	/ /	Time visited:		Date visited:	/ /	Time visited:	
Provider name:		Title:		Provider name:		Title:	

Visit a public places: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Phone	Date(s) visited	Time visited
		( )- -	/ /	
		( )- -	/ /	
		( )- -	/ /	

Attend religious gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Attend family gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Attend other gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Setting Acquired:

Child care	☐ Yes ☐ No ☐ Unk	Hospitalized	☐ Yes ☐ No ☐ Unk	Home	☐ Yes ☐ No ☐ Unk
Church	☐ Yes ☐ No ☐ Unk	International traveler	☐ Yes ☐ No ☐ Unk	School	☐ Yes ☐ No ☐ Unk
College	☐ Yes ☐ No ☐ Unk	Military	☐ Yes ☐ No ☐ Unk	Urgent care	☐ Yes ☐ No ☐ Unk
Correctional Facility	☐ Yes ☐ No ☐ Unk	Hospital ER/ Outpatient	☐ Yes ☐ No ☐ Unk	Work	☐ Yes ☐ No ☐ Unk
Doctors office	☐ Yes ☐ No ☐ Unk			Other	

Disease traced within 2 generations of known international import? ☐ Yes ☐ No ☐ Unk

CONTACTS

Number of people living in case's household: ____

Close contacts of the case (For more than one contact, print/copy additional contact pages.)

Last name: _____ Address: _____

First name: _____ City/State/Zip: _____ County: _____

DOB: __/__/____ Age: _____ Phone: _____ Type: _____

Gender: ☐ Female ☐ Male ☐ Other Symptoms present: ☐ Yes ☐ No ☐ Unk Onset date: __/__/____

If this contact has an onset date before this case then create a new case and event.

Symptoms:

Fever ☐	Onset date: __/__/____	Vomiting ☐	Onset date: __/__/____
Runny nose ☐	Onset date: __/__/____	Cough ☐	Onset date: __/__/____
Rash ☐	Onset date: __/__/____	Red eyes w/t discharge ☐	Onset date: __/__/____
Chills ☐	Onset date: __/__/____	Backache ☐	Onset date: __/__/____
Fatigue ☐	Onset date: __/__/____	Encephalitis ☐	Onset date: __/__/____
Joint pain ☐	Onset date: __/__/____	Headache ☐	Onset date: __/__/____
Nausea ☐	Onset date: __/__/____	Muscle pain ☐	Onset date: __/__/____
Photophobia ☐	Onset date: __/__/____	Otitis media ☐	Onset date: __/__/____
Sore throat ☐	Onset date: __/__/____	Pneumonia ☐	Onset date: __/__/____
		Swollen lymph nodes ☐	Onset date: __/__/____

Vaccinated for measles (MMR): ☐ Yes ☐ No ☐ Unk Number of vaccinations:

Date vaccinated: __/__/____	Date vaccinated: __/__/____	Date vaccinated: __/__/____
Lot #: _____	Lot #: _____	Lot #: _____
Vaccine type: _____	Vaccine type: _____	Vaccine type: _____
Manufacturer: _____	Manufacturer: _____	Manufacturer: _____

Exposed to measles: ☐ Yes ☐ No ☐ Unk

Received MMR within 3 days of exposure: ☐ Yes ☐ No ☐ Unk

Received IG within 6 days of exposure: ☐ Yes ☐ No ☐ Unk

Date received: __/__/____ Dose: Unit: Route:

Tested for immunity: ☐ Yes ☐ No ☐ Unk

Result: ☐ IgM+ ☐ IgM- ☐ IgG+ ☐ IgG- Is this contact a case? ☐ Yes ☐ No ☐ Unk

NOTES: _____

Diseases S-T

SALMONELLOSIS (Non-Typhoid)

Potential Bioterrorism Agent: Category B

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Report by IDSS, facsimile, mail or phone. Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Salmonellosis is caused by Salmonella bacteria other than *Salmonella typhi,* (the *Salmonella* species that causes typhoid fever). There are approximately 2,000 known serotypes; only about 200 are detected in the U.S. in any given year. Infection may begin as acute diarrhea and develop into septicemia (blood infections) or focal infection. Infectious dose of Salmonella is usually over 10, 000 organisms.

B. Clinical Description

Symptoms of Salmonellosis are diarrhea (sometimes bloody), headache, stomach cramps, fever, nausea, and sometimes vomiting. The infection may also appear as septicemia, an abscess, arthritis or cholecystitis.

Onset of illness may begin as acute enterocolitis and develop into septicemia or focal infection. Anorexia and diarrhea often persist for several days.

Complications include dehydration that may be severe, especially among infants and the elderly, and invasive disease may occur. Occasionally, the infectious agent may localize in any tissue of the body, produce abscesses and cause septic arthritis, cholecystitis, endocarditis, meningitis, pericarditis, pneumonia, pyoderma, or pyelonephritis. Deaths are uncommon, except in the very young, the very old, the debilitated and the immunosuppressed. It is estimated that 400 fatal cases occur each year; a few cases are complicated by chronic arthritis.

C. Reservoirs

Common reservoirs: humans, livestock, pets, poultry and other birds, reptiles and amphibians. Most infected animals are chronic carriers and may be asymptomatic.

D. Modes of Transmission

Spread via the fecal-oral route. By far the most common mode of transmission is ingestion of food or water that has been contaminated with animal feces. This includes raw or undercooked poultry, meats, and raw milk or milk products. Eggs can become infected “in utero,” thus should be cooked until no longer runny, or pasteurized egg products used. In addition, reptiles such as iguanas, snakes and lizards are often chronic carriers of these bacteria and can be sources of infection.

Person-to-person spread can occur when an infected food handler contaminates food. A large dose of organisms is usually needed to cause infection, but the infectious dose may be lower for certain

susceptible groups such as children, the elderly and the immunocompromised. Most often, person-to-person spread occurs among household contacts, preschool children in child care, and the elderly and developmentally disabled living in residential facilities. Transmission can also occur person-to-person through certain types of sexual contact (e.g. fecal - oral contact).

E. Incubation period

The incubation period can vary from 6 - 72 hours but is usually about 12 - 36 hours. Longer incubation periods of up to 16 days have been documented and may not be uncommon following low-dose ingestion. The higher the infectious dose of the organism, the shorter the incubation period.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as infected persons excrete *Salmonella* bacteria in their stool, but most likely while diarrhea exists. This can last from days to months, depending on the serotype, but rarely lasts more than one year. Treatment with antibiotics can prolong carriage. However, due to large infectious dose, transmission from carriers is very uncommon.

G. Epidemiology

Salmonellosis has a worldwide distribution, with approximately 1.4 million cases occurring annually in the United States alone. An estimated 1.2 million cases occur annually in the United States; of these, approximately 42,000 are laboratory-confirmed cases reported to CDC. *Salmonella* serotypes Enteritidis, Typhimurium, and Newport account for about half of culture-confirmed *Salmonella* isolates reported by public health laboratories in the U.S.

About 60-80% of cases are sporadic, but large outbreaks have occurred in institutional settings and nationwide from common food sources. The largest common-vehicle outbreak of salmonellosis ever recognized in the United States was caused by ice cream made by a large national producer when the ice cream premix was transported in contaminated tanker trucks.

H. Bioterrorism Potential

Category B Agent: Salmonella has been used as a bioterrorism agent. In one well-known example in 1984, a religious sect in Oregon deliberately contaminated salad bars at restaurants with Salmonella to disrupt an election process. Over 700 people became ill.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for others (*e.g.,* a diapered child, child care attendee or food handler) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (*e.g.* a restaurant or a commercially distributed food product) and to stop transmission from such sources.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

C. Local Public Health Agency (LPHA) Follow-up Responsibilities

Case Investigation

a. It is the LPHA responsibility to complete an *Salmonella Case Investigation form* by interviewing the case and others who may be able to provide pertinent information. Much of the information on the form can be obtained from the case's healthcare provider or the medical record.

b. Use the following guidelines in completing the form:
   1. Accurately record the demographic information, date of symptom onset, symptoms, and medical information.
   2. When asking about exposure history (food, travel, activities, etc.), use the incubation-period range for salmonellosis (6 – 72 hours). Specifically, focus on the period beginning a minimum of 6 hours prior to the case's onset back to no more than 72 hours before onset.
   3. If possible, record any restaurants at which the case ate, including food items(s) and date consumed.
   4. Ask questions about travel history and outdoor activities to help identify where the case became infected.
   5. Ask questions about water supply because salmonellosis may be acquired through water consumption.
   6. Household/close contact, pet or other animal contact, child care, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts. Ask specifically about exposure to reptiles. Determine whether the case attends or works at a child care or healthcare facility and/or is a food handler.
   7. Ask if the patient knows others who have similar illness about the same time.

   If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.*, the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as can be gathered. Please note on the form the reason why it could not be filled out completely. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

c. After completing the IDSS case investigation form, transmit to IDPH by entering the completion date in the investigation complete field under the event tab.

Iowa Department of Public Health
Attn: CADE
Lucas State Office Building
321 E. 12th Street
Des Moines, IA 50309-0075

Or FAX to (515) 281-5698

3) CONTROLLING FURTHER SPREAD

For uncomplicated cases, no antibiotic treatment is recommended. Antibiotics may encourage the development of the carrier state and may lead to resistant strains or more severe infections. However, infants under 2 months of age, the elderly, the debilitated, those with sickle disease, persons infected with HIV, or patients with continued or high fever or manifestations of extra intestinal infection, should be given antibiotic therapy.

A. Isolation and Quarantine Requirements

Exclude persons with salmonellosis from food preparation and direct child and patient care until diarrhea is resolved. Children in child care should be excluded until diarrhea ceases. Consult with the staff at CADE if any clarification is needed.

B. Protection of Contacts of a Case

None

C. Managing Special Situations

Child care

Since salmonellosis can be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of salmonellosis in a child care. General recommendations include:

- Children or staff with Salmonella infection who have diarrhea should be excluded until their diarrhea is gone.
- Good hand hygiene must be practiced at all times.

School

Since salmonellosis may be transmitted person–to-person through fecal-oral transmission, it is important to follow up carefully on cases of salmonellosis in a school. General recommendations include:

- Students or staff with Salmonella infection who have diarrhea should be excluded until their diarrhea is gone.
- Good hand hygiene must be practiced at all times.

Community Residential Programs

Actions taken in response to a case of salmonellosis in a community residential program will depend on the type of program and the level of functioning of the residents. Exclude persons with salmonellosis from food preparation and patient care until diarrhea is resolved.

In long-term care facilities, residents with salmonellosis should be placed on standard and contact precautions until their symptoms subside. Staff members who give direct patient care (*e.g.* feed patients, give mouth or denture care, or give medications) are considered food handlers and are subject to food handler restrictions. Exclude persons with salmonellosis from food preparation, direct child and patient care until diarrhea is resolved. In addition, staff members with Salmonella infection who are not food handlers should not work until their diarrhea is gone.

In residential facilities for the developmentally disabled, staff and clients with salmonellosis must refrain from handling or preparing food for other residents until their diarrhea has subsided. In addition, staff members with Salmonella infection who are not food handlers should not work until their diarrhea is gone.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of Salmonella in your city or town is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle (such as food or association with a child care center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the regional epidemiologist or CADE if assistance is needed. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross jurisdictional lines.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing them can be made in consultation with CADE and the State Hygienic Laboratory (SHL). CADE can help coordinate pickup and testing of food samples. If a commercial product is suspected, the Department of Inspections and Appeals (DIA), or their contracted agency, will coordinate follow-up with relevant agencies.

Note: The role of the DIA is to provide policy and technical assistance with the environmental investigation. This includes interpreting the Iowa Code, conducting a HACCP risk assessment, initiating enforcement actions and collecting food samples.

The general policy of the University of Iowa State Hygienic Laboratory (SHL) is only to test food samples implicated in suspected outbreaks, not in single cases, except when botulism is suspected. The LPHA may suggest that the holders of food implicated in single case incidents locate a private laboratory that will test food or store the food in their freezer for a period in case additional reports are received. However, a single, confirmed case with leftover food consumed within the incubation period most likely will not be considered for testing.

Since Salmonella is sometimes implicated in foods that have wide, sometimes national, distribution, it is critical that all Salmonella isolates be sent to SHL for "DNA fingerprinting." This allows investigators to connect Iowa illnesses and those in other parts of the country.

Preventive Measures/Education

To avoid future exposures, recommend that people:

- Make sure to thoroughly cook all food products from animals, especially poultry and eggs, and avoid consuming raw eggs, unpasteurized milk, or other unpasteurized dairy products. When preparing dishes where eggs may not be cooked (such as eggnog or sauces) use pasteurized egg products. Eggs can be contaminated with Salmonella from the chicken before the shell is formed. About 1 in 200 eggs from an infected flock may be contaminated. The risk is lower for all eggs. Only 1 in 10,000 eggs on the supermarket shelves are likely to be contaminated with *Salmonella enteritidis*.
- Always wash hands thoroughly with soap and water before eating or preparing food, after using the toilet, after changing diapers, and after touching their pets or other animals (especially reptiles).
- Wash the child's hands as well as their own after changing diapers.
- Dispose of feces in a sanitary manner in all settings.
- Keep food that will be eaten raw, such as vegetables, from becoming contaminated by animal-derived food products. Wash all foods that will be eaten rare before eating.
- Avoid letting infants or young children touch reptiles, such as turtles, snakes or iguanas, or their cages.
- Avoid reptiles when choosing pets if there are infants, elderly or immunocompromised people in the home.
- Do not use reptiles as classroom pets in a child care or schools with children younger than 5 years old.
- Avoid sexual practices that may permit fecal-oral transmission. Latex-barrier protection should be emphasized as a way to prevent the spread of salmonellosis to sexual partners as well as to prevent the exposure to, and transmission of, other pathogens.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Salmonella can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.
CDC web site, Salmonellosis; www.cdc.gov/salmonella/
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Additional Resources

USDA web site providing latest information on salmonellosis in animals
www.aphis.usda.gov/
FDA web site providing the latest food recalls:
www.fda.gov/opacom/7alerts.html

FACT SHEET SALMONELLA

What is Salmonella?
Salmonella is a common bacterial infection of the gut. Several hundred people develop this disease in Iowa each year, mostly in the summer.

Who gets Salmonella?
Anyone, but it occurs most often in infants and children.

How are Salmonella bacteria spread?
Usually transmitted to humans by eating foods contaminated with animal feces. Contaminated foods are often of animal origin, such as beef, poultry, milk, or eggs, but all foods, including vegetables, may become contaminated. Food may also become contaminated by the unwashed hands of an infected food handler.

Salmonella may also be found in the feces of some pets, especially those with diarrhea, and people can become infected if they do not wash their hands after contact with these feces. Reptiles (turtles, snakes, lizards, etc) are particularly likely to harbor Salmonella and people should always wash their hands immediately after handling a reptile, even if the reptile is healthy. Adults should also be careful that children wash their hands after handling a reptile. Homes with infants or immunocompromised persons should not have reptiles (turtles, iguanas, other lizards, and snakes) as pets.

What are the symptoms of Salmonella infection?
People infected with Salmonella may have mild or severe diarrhea, fever, and sometimes vomiting. Blood infections can be very serious, especially in the very young or very old. Typhoid fever is the most severe type of Salmonella infection.

How soon after infection with Salmonella do symptoms appear?
Diarrhea and fever usually occur 12 - 36 hours after infection, with a range of 6 – 72 hours. Longer incubations periods up to 16 days have been seen when exposed to low doses of salmonella.

Where are Salmonella found?
Salmonella are found everywhere, but most often in raw meats, uncooked eggs, contaminated water, "raw" (unpasteurized) milk and cheese. Pet turtles, iguanas, snakes, other reptiles, baby chickens, ducks, dogs, and cats can also carry Salmonella.

How long can an infected person carry Salmonella?
For several days and possibly many months. Infants and people treated with antibiotics may carry the bacteria longer than others.

Do infected people need to be excluded from work or school?
Since Salmonella is found in the feces (stool), people with diarrhea (especially children in child care centers or people who handle food) should not go to school or work. Most infected people may return to work or school when their diarrhea stops if they carefully wash their hands after using the toilet and before handling food.

What is the treatment for Salmonella?
Most people will recover without treatment. Persons with severe diarrhea, especially small children and elderly people, should see a doctor.

How can Salmonella be prevented?
1. Always refrigerate meats.
2. Always cook meats completely. Never eat raw meat.
3. Always cook eggs or food containing raw eggs.
4. Avoid unpasteurized milk or foods made with unpasteurized milk.

5. Wash hands carefully before and after preparing food.
6. Wash counter tops, cuttings boards and any utensil after use on raw meat or eggs.
7. Always wash hands carefully with soap and warm water after using the toilet or handling dirty diapers.
8. Make sure that infant's and children's hands are washed after diaper changing.
9. Make sure everyone washes their hands with soap and warm water after handling pets, especially reptiles.
10. If making foods, such as eggnog, homemade ice cream or sauces that include raw eggs, use pasteurized eggs. These can be found at grocery stores, in the refrigerated section, as liquid or shell eggs.

Salmonella
(non-typhi/paratyphi serotypes)

Agency: ______

Investigator: ______ Phone number: ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______
First and middle name: ______
Maiden name: ______ Suffix: ______
Address line: ______
Zip: ______ City: ______
State: ______ County: ______
Phone: ( )- - Type: ______
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ______

Date of Birth: / / Estimated? ☐ Age: ______
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ______
Parent/Guardian phone: ( )- - Type: ______

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom: ______
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ______ Country: ______

Healthcare provider information

Last name: ______
First name: ______
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - Type: ______

LABORATORY FINDINGS

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Salmonella*** Serotype:

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Salmonella*** Serotype:

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Salmonella*** Serotype:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admission date: / / Discharge date: / /

Days hospitalized: _____

Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

HUS Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

TTP Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

Symptoms

Diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Nausea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Vomiting ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Headache ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Muscle weakness ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Visible bloody diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Fever ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Abdominal cramps ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Chills ☐ Yes ☐ No ☐ Unk _____ Days/Hours

First symptom: Most severe symptom: Date returned to normal activities: / /

OTHER LAB FINDINGS

Clinical specimen from case

Was PFGE performed: ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

Environmental specimen testing

Food, Medication, or environmental samples tested?	☐ Yes ☐ No ☐ Unk	Describe samples:	(circle positives)
For what were the samples tested?	☐ E. coli or EHEC ☐ Salmonella ☐ Shigella ☐ Other testing (specify):		
Laboratory:		Positive? ☐ Yes ☐ No ☐ Unk	PFGE performed? ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

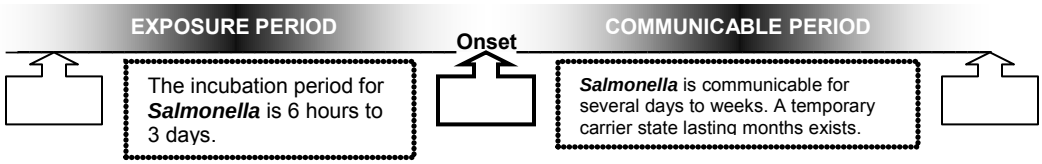
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:		Antibiotic:		Antibiotic:	
Date started:	/ /	Date started:	/ /	Date started:	/ /
Dose:		Dose:		Dose:	
Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU
# of days:		# of days:		# of days:	
# of times a day:		# of times a day:		# of times a day:	
Route:		Route:		Route:	

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risk Factors/Travel Information – *In the 3 days prior to onset of symptoms did the case:*

Travel	Travel within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:		Departure date: / /	Return date: / /
	Travel within U.S.? ☐ Yes ☐ No ☐ Unk	State:	City:	Departure date: / /	Return date: / /
	Travel outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:		Departure date: / /	Return date: / /

Visit restaurants? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below: *County and address are missing from this table*

Establishment name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attend Group Gatherings (e.g. weddings, parties)? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Where did the case purchase groceries in the 2 weeks before the onset of symptoms:

Store name	Address	City/State/Zip	County	Date purchased
				/ /
				/ /
				/ /

Dietary Information – *In the 3 days prior to onset of symptoms did the case consume the following:*

Meat and poultry

Any of these meat products? ☐ Poultry ☐ Ground beef ☐ Meat other than ground meat (salami, jerky, wild game)

Was the meat fully cooked? ☐ Yes ☐ No ☐ Unknown

List all source/types: _____

List all brand names: _____

From dates consumed: / / , / / To dates consumed: / / , / /

Other meat and poultry products

Deli/lunch meat ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw/partially cooked eggs or in foods (e.g. cookie dough)**:** ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasturized products

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized juice: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other unpasteurized products: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other products

Health supplements: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Infant formula: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Baby food: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Fruits and vegetables

Raw fruits: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw vegetables: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other

Leftover foods consumed: ☐ Yes ☐ No ☐ Unk Reheated: ☐ Yes ☐ No ☐ Unk From date consumed: / / To date consumed: / /

Describe leftovers consumed:

Animal Exposures – *In the 3 days prior to the onset of symptoms did the case:*

Check all that apply

Visit or live on a farm: ☐ Yes ☐ No ☐ Unknown

Exposed to manure: ☐ Yes ☐ No ☐ Unknown

Have farm animal contact: ☐ Yes ☐ No ☐ Unknown Animals:

Have reptile contact: ☐ Yes ☐ No ☐ Unknown ☐ Iguana ☐ Lizard ☐ Turtle ☐ Snake ☐ Other _____

Reptile lived with case: ☐ Yes ☐ No ☐ Unknown

Have other animal contact in home: ☐ Yes ☐ No ☐ Unknown Animal: Animal sick: ☐ Yes ☐ No ☐ Unk

Visit a petting zoo: ☐ Yes ☐ No ☐ Unknown Touched animals: ☐ Yes ☐ No ☐ Unk Animal:

Zoo name: Address/Zip/County:

Water Exposures – ***In the 3 days prior to the onset of symptoms did the case***

Go swimming? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below:

Water Type		Location Type	Dates visited	Facility name / Street address & Zip
☐ Hot tub/spa ☐ Kiddie pool ☐ River/stream ☐ Lake	☐ Pond ☐ Water park ☐ Swimming pool ☐ Water fountain/ splash pad ☐ Other_____	☐ Hotel/motel ☐ Indoor private ☐ Indoor public ☐ Outdoor private ☐ Outdoor public	From / / To / /	

Drinking water supply

Home:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**School:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well
Work:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**Child care:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well

Other Exposures – ***In the 3 days prior to the onset of symptoms did the case:***

Wear diapers ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unk

Have contact with immunocompromised person: ☐ Yes ☐ No ☐ Unk Setting: ☐ Home ☐ Work ☐ Other _____

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

CONTACTS

Number of people living in case's household: _____

Are there close contacts of the case with same symptoms: ☐ Yes ☐ No ☐ Unknown

Close contacts of the case with the same symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

Severe Acute Respiratory Syndrome

Report Immediately by Phone

Also known as: SARS

Responsibilities:
Hospital: Immediately by phone
Infection Preventionist: Interview patient for risk factors
Lab: Report immediately by phone. Specimens should be sent to the State Hygienic Laboratory (SHL)
Physician: Report immediately by phone
Local Public Health Agency (LPHA): Immediate follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

SARS is caused by a member of the family coronaviridae, called SARS–associated coronavirus (SARS-CoV). The disease was first reported in Asia in 2003.

B. Clinical Description

Symptoms: SARS begins with a flu-like syndrome characterized by fever (>100.4^{o} F), fatigue, headache, chills, myalgia, malaise, anorexia and, in some cases, diarrhea.

Onset of SARS occurs 3-10 days after infection with acute onset of fever. Dry cough and respiratory symptoms may begin 2 –7 days later.

Complications: Most patients develop pneumonia.

C. Reservoirs

Cave-dwelling bats in the genus *Rhinolophus* (Chinese horseshoe bats) are a reservoir of SARS-like coronaviruses closely related to those responsible for the SARS epidemic.

D. Modes of Transmission

Person-to-person: The virus that causes SARS is thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes.

Fomite: The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes.

Airborne: It is possibly spread more broadly through the air or by other ways that are not currently known.

E. Incubation Period

The incubation period for SARS is typically 3 –10 days, although in some cases it may be as long as 10 days. In a very small proportion of cases, incubation periods of up to 14 days have been reported.

F. Period of Communicability or Infectious Period

Persons with SARS are most likely to be contagious only when they have symptoms, such as fever or cough. Patients are most contagious during the second week of illness. Maximum period of communicability is less than 21 days.

G. Epidemiology

SARS is a viral respiratory illness recognized as a global threat in March 2003, after first appearing in Southern China in November 2002. During November 2002 through July 2003, 8,098 people worldwide became sick with SARS. Of these, 774 died. In the U.S., eight cases of SARS were laboratory-confirmed during the 2003 outbreak. The cases all had either a history of travel to countries where SARS was occurring or close contact to a confirmed case.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To assess the magnitude of the disease in different areas and among different risk groups.
- To identify outbreaks as soon as possible.
- To monitor for the emergency of SARS in new areas and new risk groups.
- To implement control or prevention.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider report any suspected or confirmed cases of SARS. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. If calling after business hours, call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a. Case investigation of SARS disease in Iowa residents will be directed by IDPH, Center for Acute Disease Epidemiology (CADE).
b. Following notification of IDPH, the LPHA(s) may be asked to assist in completing the case investigation. Contact CADE for proper forms. Interviewing the case and others who may be ill to provide pertinent information will help in completing forms.
c. Contact tracing will be needed and people assessed as soon as possible, along with initiation of isolation or quarantine, if applicable.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

In healthcare settings, suspected SARS patients should be immediately triaged and placed in airborne isolation, including negative pressure rooms. Healthcare providers must wear masks (N95 if available), eye protection, gowns and gloves.

- In some instances, contacts of SARS patients may be managed by using passive or active monitoring. Monitoring consists of direct contact – by phone or in person – with the health department or a designee at least once a day to assess the affected person for symptoms and address any needs. Frequent monitoring (e.g., twice a day) can reduce the interval between the onset of symptoms and the institution of precautions. Passive monitoring relies

on the affected person to contact health authorities if symptoms develop. Persons with high-risk exposures (e.g., healthcare workers involved in aerosol-generating procedures on a SARS patient) may require activity restrictions in addition to monitoring.
- Quarantine of contacts may be used during a large outbreak or in situations of high-risk exposures (e.g., if transmission from a particular case has been demonstrated by emergence of secondary cases among one or more contacts).

B. Protection of Contacts of a Case
- All close contacts of SARS cases should be in quarantine and should be advised to:
  - Be vigilant for fever (e.g., measure temperature twice a day), respiratory symptoms, and other symptoms of early SARS-CoV illness for 10 days after exposure.
  - Contact a designated health department staff member if symptoms develop so that clinical evaluation can be performed without delay.
  - Inform the healthcare provider in advance of a visit to a healthcare facility about possible exposure to SARS-CoV.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected:

Refer to healthcare facility SARS plan or IDPH SARS Response Plan.

Exposure of a Laboratory Worker

- Clinical laboratories performing routine hematology, urinalysis, and clinical chemistry studies, and microbiology laboratories performing diagnostic tests on serum, blood, or urine specimens, should follow standard laboratory practices, including standard precautions, when handling potential SARS-CoV specimens. For additional information, see www.osha.gov./SLTC/bloodbornepathogens/index.html
- Microbiology and pathology laboratories performing diagnostic tests on stool or respiratory specimens should handle potential SARS-CoV specimens using standard Bio-safety Level (BSL)-2 work practices in a Class II biological safety cabinet.

SARS transmission has occurred in several researchers working with SARS virus. All laboratorians must take appropriate precautions when handling specimens to be tested for SARS. Send all specimens to SHL. Do not perform tests in the hospital laboratory.

D. Preventive Measures

Preventive Measures/Education
- All healthcare providers should know and follow appropriate isolation precautions when caring for a suspect or confirmed SARS patient.
- Contacts of SARS patients should be educated on signs and symptoms and who to contact should symptoms occur.
- Isolation and quarantine should be instituted as indicated.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for SARS can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

MMWR December 12, 2003/52 (49) 1202-1206, Revised U.S. Surveillance Case Definition for Severe Acute Respiratory Syndrome (SARS) and Update on SARS Cases ---United States and Worldwide, December 2003

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Additional Resources

CDC SARS web site, www.cdc.gov/ncidod/sars/index.htm
WHO SARS web site, www.who.int/csr/sars/en/

FACT SHEET Severe Acute Respiratory Syndrome (SARS)

What is SARS?
Severe Acute Respiratory Syndrome (SARS) is a disease that can cause severe difficulty breathing and pneumonia.

Who can be infected?
Anyone can become infected but cases of SARS have been reported mainly among people who have had direct close contact with an infected person, such as those sharing a household with a SARS patient and healthcare workers who did not use infection prevention procedures while taking care of a SARS patient. In the United States, there have been signs of community spread, though spread to close contacts and healthcare workers has not occurred.

How does SARS Spread?
The main way that SARS appears to spread is by close person-to-person contact. Most cases of SARS have involved people who cared for or lived with someone with SARS, or who had direct contact with infectious material (for example, respiratory secretions) from a person who has SARS. Potential ways in which SARS can be spread include touching the skin of other people or objects that are dirty with infectious droplets and then touching your eye(s), nose, or mouth. This can happen when someone who is sick with SARS coughs or sneezes droplets onto themselves, other people, or nearby surfaces. It also is possible that SARS can be spread more broadly through the air or by other ways that are currently unknown.

What are the symptoms of SARS?
Symptoms of SARS will begin within 10 days of exposure. In general, SARS begins with a fever greater than 100.4°F [>38.0°C]. Other symptoms may include headache, an overall feeling of discomfort, and body aches. Some people also experience mild respiratory symptoms. After 2 - 7 days, SARS patients may develop a dry cough and have trouble breathing, frequently leading to pneumonia.

What is the cause of SARS?
Scientists at CDC and other laboratories have detected a previously unknown virus. This has been named SARS-associated coronavirus (SARS-CoV).

Are there travel recommendations related to SARS?
When SARS is occurring in the world, CDC will issue recommendations and guidelines for people who may be affected. CDC will also issue travel alerts for areas where SARS may be present but no transmission is occurring. In these areas, CDC recommends that U.S. travelers observe precautions to safeguard their health. These precautions include frequent handwashing and staying away from ill people.

Travelers to areas reporting SARS cases should avoid settings where transmission is most likely to occur, such as health care facilities, caring for SARS patients, and residences of SARS patients.

What should people do if they think they might have SARS?
People who have had potential exposure to SARS and/or have had contact with someone with SARS should monitor their health status for 10 days after their last possible exposure. People with symptoms of SARS (fever greater than 100.4°F [>38.0°C] accompanied by a cough and/or difficulty breathing) should limit their contact with others and call their healthcare provider to arrange to be seen in a safe manner at a clinic or emergency room. Do not go to a clinic or emergency room without calling ahead. To help healthcare providers make a diagnosis, tell them about any recent travel to places where SARS has been reported or whether there was contact with someone who had these symptoms. Cover your mouth and

nose with tissue when coughing or sneezing. If you have a surgical mask, wear it during close contact with other people. A mask can reduce the number of droplets coughed into the air.

If you have SARS and are being cared for at home, you should:

Follow the instructions given by your state or local health department, which will include:
Staying home until 10 days after temperature has returned to normal and respiratory symptoms have gone away. Other instructions may be:

- Do not go to work, school, or public areas.
- Wash your hands often and well, especially after you have blown your nose.
- Cover your mouth and nose with tissue when you sneeze or cough.
- If possible, wear a surgical mask when around other people in your home. If you can't wear a mask, the members of your household should wear one when they are around you.
- Do not share silverware, towels, or bedding with anyone in your home until these items have been washed with soap and hot water.
- Clean surfaces (counter or tabletops, door knobs, bathroom fixtures, etc.) that have been contaminated by body fluids (sweat, saliva, mucous, or even vomit or urine) from the SARS patient with a household disinfectant used according to the manufacturer's instructions. Wear disposable gloves during all cleaning. Throw these out when you are done. Do not re-use them. If clothing has become soiled with body fluids, it should be changed.
- Follow these instructions for 10 days after fever and respiratory symptoms are gone.

If you are caring for someone at home who has SARS, you should:

- Be sure that the patient has contacted a healthcare provider and is following instructions for medication and care.
- Be sure that all members of your household are washing their hands frequently with soap and warm water or using alcohol-based hand wash.
- Wear disposable gloves if you have direct contact with body fluids of a SARS patient. However, the wearing of gloves is not a substitute for good hand hygiene. After contact with body fluids of a SARS patient, remove the gloves, throw them out, and wash your hands. Do not wash or re-use the gloves.
- Encourage patients with SARS to cover their mouth and nose with a tissue when coughing or sneezing. If possible, the patient should wear a surgical mask during close contact with other people in the home. If the patient cannot wear a surgical mask, other members of the household should wear one when in the same room with that person.
- Do not use silverware, towels, bedding, clothing, or other items that have been used by the patient until these items have been washed with soap and hot water.
- Clean surfaces (counter or tabletops, door knobs, bathroom fixtures, etc.) that have been contaminated by body fluids (sweat, saliva, mucous, or even vomit or urine) with a household disinfectant used according to the manufacturer's instructions. Wear disposable gloves during all cleaning. Throw these out when done. Do not re-use them. If clothing has become soiled with body fluids, it should be changed.
- Follow these instructions for 10 days after the patient's fever and respiratory symptoms have gone away.
- If you develop a fever or respiratory symptoms, call your healthcare provider immediately and tell him or her that you have had close contact with a SARS patient.

What laboratory tests are available for SARS?

Several laboratory tests can be used to detect SARS-CoV. A reverse transcription polymerase chain reaction (RT-PCR) test can detect SARS-CoV in clinical specimens such as blood, stool and nasal secretions. Diagnosis is a combination of history, symptoms and tests results.

What should be done for healthy people returning to the U.S. from areas of risk?
The risk in a healthy individual traveler is extremely low. A traveler with no symptoms needs to monitor for a fever > 100.4 F and/or cough for 10 days after leaving the affected area. If symptoms develop, contact a healthcare provider immediately by phone. Do not go to a clinic or hospital without phoning first so proper isolation precautions can be immediately taken to prevent spread.

This fact sheet provides basic information about the disease and what is being done to fight its spread. To find out more about SARS, go to CDC's SARS web site: www.cdc.gov/niosh/topics/SARS/

SARS

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Facility phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown Date of death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: **SARS-CoV**

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: **SARS-CoV**

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Test type: _____

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: **SARS-CoV**

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'
(If yes, complete the following sections for each known occupation)

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Initial classification (select one):
☐ Severe respiratory illness with no known epi link
☐ mild to moderate respiratory illness and epi link including possible SARS exposure
☐ Severe respiratory illness and epi link including possible SARS exposure
☐ Mild to moderate respiratory illness and epi link including likely SARS exposure
☐ Severe respiratory illness and epi link including likely SARS exposure
☐ Clinically compatible illness and laboratory confirmation of SARS-CoV

Fever: ☐ Yes ☐ No ☐ Unk Onset Date: / / Duration: hours/days Highest known fever: C/F

Other symptoms:
☐ Chills
☐ Cough
☐ Diarrhea
☐ Fever
☐ Shortness of breath

Health care provider visited: ☐ Yes ☐ No ☐ Unknown
If Yes, complete the following table:

Facility name: _____ _____

Address: _____ Zip code: _____

City: _____ State: _____ County: _____ _____

Phone: ( )- - Type: _____ Date visited: / / Time visited:

Provider name: _____ Title: _____

Chest x-ray done: ☐ Yes ☐ No ☐ Unk Date: / / Result: _____

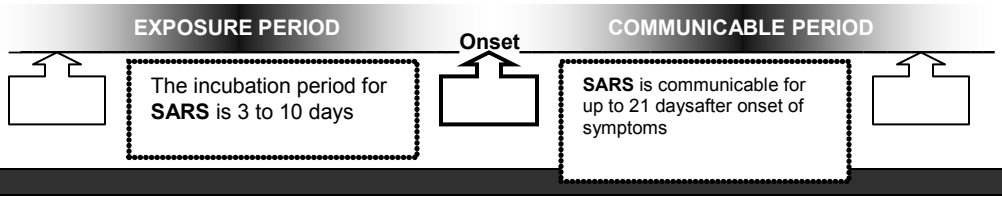
Pneumonia: ☐ Yes ☐ No ☐ Unk Suggestive of RDS: ☐ Yes ☐ No ☐ Unk

CAT scan done: ☐ Yes ☐ No ☐ Unk Date: / / Result: _____

Updated classification (select one):
☐ Severe respiratory illness with no known epi link
☐ Mild to moderate respiratory illness and epi link including possible SARS exposure
☐ Severe respiratory illness and epi link including possible SARS exposure
☐ Mild to moderate respiratory illness and epi link including likely SARS exposure
☐ Severe respiratory illness and epi link including likely SARS exposure
☐ Clinically compatible illness and laboratory confirmation of SARS-CoV
☐ Not a case: negative serology (> 28 days post onset)
☐ Not a case: alternative diagnosis accounts for illness

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risk Factors/Travel Information – *In the 10 days prior to onset of symptoms:*

Traveled within Iowa:	☐ Yes ☐ No ☐ Unk	Departure date:	/ /	**Traveled within Iowa:**	☐ Yes ☐ No ☐ Unk	Departure date:	/ /
City within Iowa:	☐ Yes ☐ No ☐ Unk	Return date:	/ /	City within Iowa:	☐ Yes ☐ No ☐ Unk	Return date:	/ /
Type:	☐ Airline ☐ Automobile ☐ Bus ☐ Cruise ship ☐ Train	Company name: / Transport #:		Type:	☐ Airline ☐ Automobile ☐ Bus ☐ Cruise ship ☐ Train	Company name: / Transport #:	
Tour group:	☐ Yes ☐ No ☐ Unk	Symptomatic during travel:	☐ Yes ☐ No ☐ Unk	Tour group:	☐ Yes ☐ No ☐ Unk	Symptomatic during travel:	☐ Yes ☐ No ☐ Unk

Traveled within U.S.:	☐ Yes ☐ No ☐ Unk	Departure date:	/ /	**Traveled within U.S.:**	☐ Yes ☐ No ☐ Unk	Departure date:	/ /
City, State	☐ Yes ☐ No ☐ Unk	Return date:	/ /	City State	☐ Yes ☐ No ☐ Unk	Return date:	/ /
Type:	☐ Airline ☐ Automobile ☐ Bus ☐ Cruise ship ☐ Train	Company name: / Transport #:		Type:	☐ Airline ☐ Automobile ☐ Bus ☐ Cruise ship ☐ Train	Company name: / Transport #:	
Tour group:	☐ Yes ☐ No ☐ Unk	Symptomatic during travel:	☐ Yes ☐ No ☐ Unk	Tour group:	☐ Yes ☐ No ☐ Unk	Symptomatic during travel:	☐ Yes ☐ No ☐ Unk

Travel outside U.S.:	☐ Yes ☐ No ☐ Unk	Departure date:	/ /	**Traveled outside U.S.:**	☐ Yes ☐ No ☐ Unk	Departure date:	/ /
City Country:	☐ Yes ☐ No ☐ Unk	Return date:	/ /	City Country	☐ Yes ☐ No ☐ Unk	Return date:	/ /
Type:	☐ Airline	Company name:		Type:	☐ Airline ☐ Automobile	Company name:	

☐ Automobile ☐ Bus ☐ Cruise ship ☐ Train	Transport #:	☐ Bus ☐ Cruise ship ☐ Train	Transport #:
Tour group: ☐ Yes ☐ No ☐ Unk	Symptomatic during travel: ☐ Yes ☐ No ☐ Unk	Tour group: ☐ Yes ☐ No ☐ Unk	Symptomatic during travel: ☐ Yes ☐ No ☐ Unk

Contact with confirmed or probable SARS CoV case: ☐ Yes ☐ No ☐ Unknown **Contact with epi-linked SARS CoV case:** ☐ Yes ☐ No ☐ Unknown

CONTACTS

Number of people living in case's household: _____

Are there close contacts of the case with similar symptoms: ☐ Yes ☐ No ☐ Unknown

Close contacts with similar symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Did the case recently travel to an area with SARS transmission? ☐ Yes ☐ No ☐ Unknown **If yes, where:**

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Did the case recently travel to an area with SARS transmission? ☐ Yes ☐ No ☐ Unknown **If yes, where:**

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case		List symptoms	Symptom onset date	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Did the case recently travel to an area with SARS transmission? ☐ Yes ☐ No ☐ Unknown **If yes, where:**

Notes:

State use only

11. Classification of patient by state of municipality (using CSTE/CDC definitions): SEE APPENDIX B1	
Initial Classification (check one only): *Report Under Investigation (RUI)* □ RUI-1 □ RUI-2 □ RUI-3 □ RUI-4 *OR SARS disease classification* □ Probable SARS-CoV Case □ Confirmed SARS-CoV Case	Updated Classification (check one only): □ RUI-1 □ RUI-2 □ RUI-3 □ RUI-4 □ Probable SARS-CoV Case □ Confirmed SARS-CoV Case □ Not a case: negative serology (>28 days post onset) □ Not a case: alternative diagnosis accounts for illness Date Updated (most recent): __ __ / __ __ / __ __ __ __ m m d d y y y y

13. Alternative Diagnosis

Was an alternative respiratory pathogen detected?
□ Yes
□ No
□ Unknown

If yes indicate which one (see list below): _____

Alternative pathogen (e.g., Influenza A, Influenza B, RSV, rhinovirus, adenovirus, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Mycoplasma*, *Chlamydia pneumoniae*, human parainfluenza virus 1, human parainfluenza 2, human parainfluenza 3, human metapneumovirus, *Legionella* sp., other.):

14. List specimens sent to the CDC

Chose from the following specimens to enter below:
Whole blood, plasma, serum (acute), serum (convalescent), NP swab, NP aspirate, broncheoalveolar lavage specimen, OP swab, tracheal aspirate, pleural tap, urine, stool, tissue.

Specimen 1: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y
Specimen 2: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y
Specimen 3: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y
Specimen 4: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y
Specimen 5: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y
Specimen 6: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y
Specimen 7: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y
Specimen 8: _____	If 'Tissue', Specify: _____	Date Sent: __ __ / __ __ / __ __ __ __ m m d d y y y y

SHIGELLOSIS

Potential Bioterrorism Agent: Category B

Also known as: Bacillary dysentery, Shigella

Responsibilities:
Hospital: Report by facsimile, mail or phone
Lab: Report by facsimile, mail or phone
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Shigellosis refers to disease caused by any bacteria in the genus *Shigella*. There are four *Shigella* species: *S. dysenteriae* (Group A), *S. flexneri* (Group B), *S. boydii* (Group C), and *S. sonnei* (Group D). Groups A, B, C, and D are further divided into 12, 14, and 18 serotypes, respectively, but S. *sonnei* consists of only one serotype. Some strains produce enterotoxin and Shiga toxin, which probably play a role in destructive ulcerations in the intestines once the organisms have invaded. This explains the watery and sometimes bloody diarrhea seen the first or second day of illness.

B. Clinical Description

Symptoms: are characterized by diarrhea accompanied by fever, nausea and sometimes, vomiting, cramps and tenesmus (painful, especially ineffectual straining at stool or urination).

Onset: typically includes blood and mucus in stools, resulting from mucosal ulcerations and minute abscesses caused by the invasive organisms. Milder cases may have a watery diarrhea. Illness is usually self-limited, lasting an average of 4 - 7 days

Complications: The most common complication is dehydration, but they may also include convulsions in young children. The severity of illness is a function of the host (age and preexisting nutritional state), the serotype, and bacteria's ability to produce toxin. Death is uncommon in U.S., but common worldwide.

C. Reservoirs

Common reservoirs: Humans are the only significant reservoir.

D. Modes of Transmission

Person-to-Person: Transmitted via the fecal-oral route. People shedding bacteria may contaminate food by failing to properly wash their hands before food handling, potentially causing large numbers of people to become ill. A very small dose of *Shigella* is needed to cause illness (probably 10 – 100 organisms); thus, it can be easily spread. Person-to-person spread typically occurs among household contacts, pre-school children in child care, and the elderly and developmentally disabled living in residential facilities. Secondary attack rate in households can be as high as 40%. Transmission can also occur person-to-person through certain types of sexual contact (*e.g.,* oral-anal contact).

Foodborne: Flies can potentially spread the bacteria by landing on contaminated feces and then on food. This is most common during international travel.
Waterborne: Fecal contaminated recreational water, such as fill and drain wading pools, can be a source for spread.

E. Incubation period

The incubation period can vary from 12 - 96 hours, but is usually about 24 - 72 hours. It can be up to a week for *S. dysenteriae.*

F. Period of Communicability or Infectious Period

The disease is communicable as long as infected people excrete *Shigella* in their stool. This usually lasts for about 4 weeks from onset of illness; however, people are most infectious while having diarrhea. Effective antibiotic treatment has been shown to decrease the shedding period to a few days.

G. Epidemiology

Shigellosis has a worldwide distribution, with approximately 600,000 deaths reported annually throughout the world. Two-thirds of these cases and most of the deaths are in children under 10. Secondary attack rates can be as high as 40% in households. Every year about 14,000 cases are reported in the U.S. Approximately 100 cases are reported in Iowa annually. Outbreaks most often occur in child care centers, among men who have sex with men, and in jails. Outbreaks have also been caused by contaminated imported food. *S. sonnei* is the most common *Shigella* species reported in Iowa. Diapered children playing in "kiddie" pools or other recreational water for young children filled with tap water without addition of chlorine or bleach can also easily spread *Shigella*.

H. Bioterrorism Potential

Category B Agent: *Shigella* has been identified as a potential category B bioterrorism agent as a food safety threat.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To determine whether a case may be a source of infection for others (e.g., a diapered child, child care attendee or food handler) and if so, to prevent further transmission.
- To identify transmission sources of public health concern (*e.g.,* a restaurant or a commercially distributed food product) and to stop transmission.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides testing of stool specimens for the presence of *Shigella* and will confirm and speciate isolates of *Shigella* obtained from clinical specimens at other laboratories. All laboratories are required to submit all isolates cultured for further identification to aid in the public health surveillance necessary for this illness and to prevent further transmission. For more information call SHL at (319)-335-4500.

SHL will test implicated food items from a cluster or outbreak. Food samples are submitted through consultation with SHL and the Centers for Acute Disease Epidemiology by the local public health department.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

Following notification, the LPHA(s) will complete an official investigation. Information can be entered into IDSS by interviewing the case and others who may be able to provide pertinent information. Much of the information required can be obtained from the healthcare provider or the medical record.

a. Use the following guidelines to complete the investigation:
   1) Accurately record the demographic information, date of symptom onset, symptoms, diagnostic testing, date of specimen collection, laboratory conducting the testing, species identification and serotyping. Please, request isolates to be sent to the SHL.
   2) When asking about exposure history (food, travel, activities, etc.), use the incubation period for shigellosis (12–96 hours). Specifically, focus on the period beginning a minimum of 12 hours prior to the case's onset back to 96 hours before onset.
   3) Record any restaurants at which the case ate during the incubation period, including food item(s) and date consumed. If it is suspected that the case became infected through food, further investigation may be needed
   4) Ask about travel history and outdoor activities to help identify where the case may have been infected.
   5) Ask about the case's water supply as well as recreational water activities because *Shigella* may be acquired through water consumption.
   6) A case history that includes household/close contacts, antimicrobial treatment, pet or other animal contact, child care, and food-handler questions is designed to look for possible exposure and also to assess potential for transmitting and risk to others. Important information from a public health perspective would include child care attendance or employment or food handling.
   7) If repeated attempts to obtain case information have been unsuccessful (*e.g.,* the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please complete the investigation with as much information as possible. Please note on the form the reason why it could not be filled out completely. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

b. After compiling the information, enter into IDSS (the preferred method for investigation) or complete the investigation form, attach lab report(s) when available and fax (515) 281-5698 or mail (in an envelope marked "Confidential") to IDPH Center for Acute Disease Epidemiology. The mailing address is:

   IDPH, CADE
   Lucas State Office Building, 5th Floor
   321 E. 12th Street
   Des Moines, IA 50319-0075

c. Disease-control measures are an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Food handlers, healthcare providers and people in child care with shigellosis must be excluded.

Minimum Period of Isolation of Patient

For food handlers and child care employees and attendees and direct care givers, two negative stool cultures must be obtained after resolution of diarrhea before they may return to work/school/child care. If a case has been treated with an antimicrobial, the stool specimen shall not be submitted until at least 48 hours after completion of therapy and the two specimens must be taken at least 24 hours apart. Good hand hygiene must be practiced.

Minimum Period of Quarantine of Contacts

Food handlers, healthcare providers and child care attendees who are contacts to a case and symptomatic with diarrhea shall be considered the same as a case and they must comply with the above requirements.

Note: A food handler is any person directly preparing or handling food. This can include a patient-care or child care provider. See glossary for a more complete definition.

B. Protection of Contacts of a Case

Instructions for stringent hand-hygiene practices will be shared with all cases as well as their contacts.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Child care

Since shigellosis may be easily transmitted person-to-person through the fecal-oral route and fecal contamination is common in toddlers, it is important to carefully follow up on cases of shigellosis in child care settings. General recommendations include:

- Children with *Shigella* infection who have diarrhea should be excluded until their diarrhea is gone and have 2 negative stool cultures taken at least 24 hours apart. If treated with antibiotics, wait 48 hours after completion of antibiotics before obtaining the first stool specimen and allow an additional 24 hours before obtaining the second specimen.
- Children with *Shigella* infection who have no diarrhea but do have positive stool cultures and are not otherwise ill should be excluded as above.
- Staff of child care programs who have *Shigella* in their stools should be excluded as above.
- Always ensure thorough cleaning of the child care and disinfection of related items (such as toys).

School

Since shigellosis may be easily transmitted person-to-person via the fecal-oral route, it is important to carefully follow up on cases of shigellosis in a school. General recommendations include:

- Students or non food-handling staff with *Shigella* infection who have diarrhea should be excluded until their diarrhea is gone.

- Students or staff with *Shigella* positive cultures who do not handle food, have no diarrhea, and are not otherwise sick may go to school if good hand hygiene is practiced.

- Students or staff who handle food and have *Shigella* infection (symptomatic or not) must not prepare food until their diarrhea is gone and they have two negative stool tests (submitted at

least 48 hours after completion of antibiotic therapy, if antibiotics are given, and taken at least 24 hours apart).

- Ensure routine thorough cleaning of the environment.

Community Residential Programs

Actions taken in response to a case of shigellosis in a community residential program will depend on the type of program and the functional level of the residents.

In long-term care facilities, residents with shigellosis should be placed on Standard (including enteric) Precautions until their symptoms subside *and* they test negative for *Shigella*. Staff members who give direct patient care (*e.g.,* feed patients, provide mouth or denture care, or give medications) are considered food handlers and are subject to food handler restrictions as listed above. In addition, staff members with *Shigella* infection who are not food handlers should not work until their diarrhea is completely resolved (no diarrheal stools for 24 hours).

In residential facilities for the developmentally disabled, staff and clients with shigellosis must refrain from handling or preparing food for other residents until their symptoms have subsided and they have 2 stool tests negative for *Shigella* (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given and taken at least 24 hours apart). In addition, staff members with *Shigella* infection who are not food handlers should not work until diarrhea is gone, and they must practice good hand hygiene when they return to work. Routine thorough cleaning of the environment must also occur.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of shigellosis in your city/town seems higher than usual, or if an outbreak is suspected, more intensive investigation is warranted. That includes looking for a common source. A common vehicle (such as water, food, or association with a child care) should be sought and appropriate preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist on-call at the Center for Acute Disease Epidemiology (CADE) or the regional epidemiologist for guidance on prevention and surveillance for additional cases.

Note: Refer to Iowa's Foodborne Illness Outbreak Investigation Manual.

D. Preventive Measures

Educate families with cases in households on ways to control spread.

Shigella organisms readily develop antibiotic resistance; thus, antibiotics should be used judiciously.

Environmental Measures

If a water source is implicated it must be shut down.

Implicated food must not be served. Samples of the food should be obtained before any disposal of food items. The decision about testing the food can be made in consultation with the CADE and the State Hygienic Laboratory (SHL). CADE can help coordinate pick up and testing of food samples. If a commercial product is suspected, CADE will coordinate follow-up with relevant agencies such as Iowa Department of Inspections and Appeals (DIA).

Note: The role of the DIA is to provide policy and technical assistance, such as interpreting the Iowa Food Code, conducting a hazard analysis critical control point (HACCP) risk assessment, initiating enforcement actions and collecting food samples, with the environmental investigation.

The general policy of the SHL is to test only food samples implicated in suspected outbreaks, not single cases (except when botulism is suspected). The local public health agency (LPHA) may suggest that the handlers of food suspected in a single case locate a private laboratory that will test or freeze the food for a period of time in case additional reports are received.

To prevent *Shigella* and other pathogens transmitted by the fecal-oral route, it is recommended that people:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- Wash children's hands as well as their own after changing diapers.
- In child care settings, dispose of feces in a sanitary manner.
- Scrub their hands with soap and water, when caring for someone with diarrhea, after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes or soiled sheets.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized to prevent the spread of shigellosis to sexual partners and to prevent the exposure to, and transmission of, other pathogens.
- Keep flies from contaminating food.
- Routinely clean the environment thoroughly.
- Clean environment with household disinfectant or bleach and water solution (one quarter cup bleach per gallon of water, mixed fresh daily).

International Travel

The following recommendations can be helpful for travelers to developing countries.

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than uncarbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water. Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are often inadequately washed.
- Peel your own raw fruits or vegetables and do not eat the peelings.
- Avoid foods and beverages from street vendors.

Note: For more information on international travel, contact the Center for Disease Control and Prevention (CDC), Traveler's Health Office, at (877) 394-8747 or through the Internet at www.cdc.gov/travel.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Shigellosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.
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www.cdc.gov/nczved/divisions/dfbmd/diseases/shigellosis/
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

FACT SHEET

SHIGELLOSIS
(Shigella)

What is Shigellosis?
Shigellosis is an infection of the gut caused by the bacterium, *Shigella*. Most people become ill in the summer and early fall.

What are the symptoms of an infection with *Shigella* bacteria?
A person(s) infected with *Shigella* may have mild to severe diarrhea, fever, and painful bloody, mucous stools. Some infected person(s) may not have any symptoms.

How soon do symptoms appear?
Diarrhea may appear 12 hours to 4 days after infection, but usually within 1 - 3 days.

How is *Shigella* spread?
Shigella is found in the feces (stool) of an infected person(s). It is very easily spread by close contact with an infected person or eating contaminated food or drinking contaminated water. Once one person in the family is ill it is common for other family members to become ill.

Who gets Shigellosis?
Anyone can get Shigellosis. Young children, especially those in child care centers, or living in crowded conditions, are infected more often.

How long is a person infectious?
During the time a person is ill and up to four weeks after the illness.

What is the treatment?
Most people will recover without treatment. People with severe diarrhea, especially small children and elderly people, should see a doctor.

Do infected people need to be excluded from school, work, or child care?
Since *Shigella* is found in the feces (stool), and is easily spread, people with diarrhea should not go to child care, school, or work. For people who handle food, child care workers or attendees, or healthcare workers, treatment should be considered. These people should have two negative stool cultures, taken at least 24 hours apart and not more than 48 hours after antibiotics stopped, if given, before they return to work or child care.

How can you prevent the spread of these bacteria?
Good handwashing with soap and running warm water for no less than 15 seconds (about the time it takes to sing “happy birthday” or “the ABC” song), that includes particular attention to the front and back of the hands and between the fingers, and particular attention to around and underneath the fingernails, must be practiced. Good handwashing must be done every time people use the toilet, change a diaper, or before they eat or prepare any food. Infants and children must also have their hands washed, as above, after diapers have been changed or after using the toilet and before eating. If children are helping to prepare food, their hands must be washed beforehand.

Shigellosis

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:

Gender: ☐ Female ☐ Male ☐ Other

Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed

Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Parent/Guardian name:

Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name:

Exposure setting:

Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: Country:

Healthcare provider information

Last name:

First name:

Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA

Facility name:

Address line 1:

Address line 2:

Zip code: City:

State: County:

Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Shigella*** Serotype:

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Shigella*** Serotype:

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Shigella*** Serotype:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Admission date: / / Discharge date: / /
Days hospitalized: _____
Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type: _____

CLINICAL INFO & DIAGNOSIS

HUS Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /
TTP Diagnosis ☐ Yes ☐ No ☐ Unk Onset Date / /

Symptoms

Diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Nausea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Vomiting ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Headache ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Muscle weakness ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Visible bloody diarrhea ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Fever ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Abdominal cramps ☐ Yes ☐ No ☐ Unk _____ Days/Hours
Chills ☐ Yes ☐ No ☐ Unk _____ Days/Hours

First symptom: Most severe symptom: Date returned to normal activities: / /

OTHER LAB FINDINGS

Clinical specimen from case
Was PFGE performed: ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

Environmental specimen testing

Food, Medication, or environmental samples tested?	☐ Yes ☐ No ☐ Unk	Describe samples:	(circle positives)
For what were the samples tested?	☐ E. coli or EHEC ☐ Salmonella ☐ Shigella ☐ Other testing (specify):		
Laboratory:		Positive? ☐ Yes ☐ No ☐ Unk	PFGE performed? ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

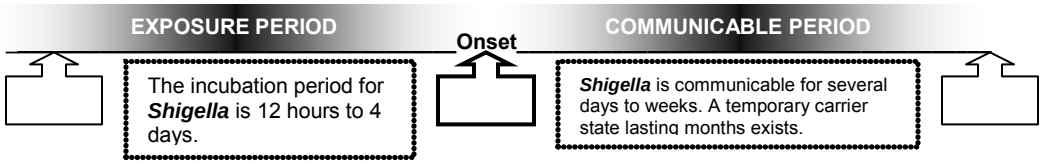
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU	Unit: ☐ mg ☐ ml ☐ IU
# of days:	# of days:	# of days:
# of times a day:	# of times a day:	# of times a day:
Route:	Route:	Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risk Factors/Travel Information – *In the 4 days prior to onset of symptoms did the case:*

Travel	Travel within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:		Departure date: / /	Return date: / /
	Travel within U.S.? ☐ Yes ☐ No ☐ Unk	State:	City:	Departure date: / /	Return date: / /
	Travel outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:		Departure date: / /	Return date: / /

Visit restaurants? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below: *County and address are missing from this table*

Establishment name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attend Group Gatherings (e.g. weddings, parties)? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/Zip	Date visited	Foods consumed	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Purchase groceries in the 2 weeks before the onset of symptoms:

Store name	Address	City/State/Zip	County	Date purchased
				/ /
				/ /
				/ /

Dietary Information – *In the 4 days prior to onset of symptoms did the case consume the following:*

Meat and poultry

Any of these meat products? ☐ Poultry ☐ Ground beef ☐ Meat other than ground meat (salami, jerky, wild game)

Was the meat fully cooked? ☐ Yes ☐ No ☐ Unknown

List all source/types: _____

List all brand names: _____

From dates consumed: / / , / / To dates consumed: / / , / /

Other meat and poultry products

Deli/lunch meat ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw/partially cooked eggs or in foods (e.g. cookie dough)**:** ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasturized products

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Unpasteurized juice: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other unpasteurized products: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other products

Health supplements: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Infant formula: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Baby food: ☐ Yes ☐ No ☐ Unk From date consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Fruits and vegetables

Raw fruits: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Raw vegetables: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /

List all source/types: List all brand names:

Other

Leftover foods consumed: ☐ Yes ☐ No ☐ Unk Reheated: ☐ Yes ☐ No ☐ Unk From date consumed: / / To date consumed: / /

Describe leftovers consumed:

Animal Exposures – *In the 4 days prior to the onset of symptoms did the case:*

Check all that apply

Visit or live on a farm: ☐ Yes ☐ No ☐ Unknown

Exposed to manure: ☐ Yes ☐ No ☐ Unknown

Have farm animal contact: ☐ Yes ☐ No ☐ Unknown Animals:

Have reptile contact: ☐ Yes ☐ No ☐ Unknown ☐ Iguana ☐ Lizard ☐ Turtle ☐ Snake ☐ Other _____

Reptile lived with case: ☐ Yes ☐ No ☐ Unknown

Have other animal contact in home: ☐ Yes ☐ No ☐ Unknown Animal: Animal sick: ☐ Yes ☐ No ☐ Unk

Visit a petting zoo: ☐ Yes ☐ No ☐ Unknown Touched animals: ☐ Yes ☐ No ☐ Unk Animal:

Zoo name: Address/Zip/County:

Water Exposures – ***In the 4 days prior to the onset of symptoms did the case***

Go swimming? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below:

Water Type	Location Type	Dates visited	Facility name / Street address & Zip
☐ Hot tub/spa ☐ Pond ☐ Kiddie pool ☐ Water park ☐ River/stream ☐ Swimming pool ☐ Lake ☐ Water fountain/ splash pad ☐ Other_____	☐ Hotel/motel ☐ Indoor private ☐ Indoor public ☐ Outdoor private ☐ Outdoor public	From / / To / /	

Drinking water supply

Home:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**School:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well
Work:	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well	**Child care:**	☐ Bottled ☐ Commercial Delivery	☐ Municipal ☐ Rural water	☐ Well

Other Exposures – ***In the 8 days prior to the onset of symptoms did the case:***

Wear diapers ☐ Yes ☐ No ☐ Unk **Have contact with diapers:** ☐ Yes ☐ No ☐ Unk

Have contact with immunocompromised person: ☐ Yes ☐ No ☐ Unk Setting: ☐ Home ☐ Work ☐ Other _____

Have sex with someone with similar symptoms: ☐ Yes ☐ No ☐ Unk Sexual preference: ☐ Hetero ☐ Homo ☐ Bisexual ☐ Unknown

CONTACTS

Number of people living in case's household: ____

Are there close contacts of the case with same symptoms: ☐ Yes ☐ No ☐ Unknown

Close contacts of the case with the same symptoms

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case	List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Sexual contact ☐ Child ☐ Family member (non-household) ☐ Sibling ☐ Friend/acquaintance ☐ Roommate ☐ Contact- work/school/etc ☐ Parent/ guardian ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case	List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Sexual contact ☐ Child ☐ Family member (non-household) ☐ Sibling ☐ Friend/acquaintance ☐ Roommate ☐ Contact- work/school/etc ☐ Parent/ guardian ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES:

SMALLPOX

Report Immediately by phone

Potential Bioterrorism Agent: Category A

Responsibilities:
Hospital: Report immediately by phone
Lab: Report immediately by phone, send specimens for testing to State Hygienic Laboratory
Physician: Report immediately by phone
Local Public Health Agency (LPHA):): **Immediate follow-up required. Iowa Department of Public Health will lead the follow-up investigation.**

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698
After Hours: Iowa State Patrol Office at (515) 323-4360

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Smallpox is caused by the variola virus that emerged in human populations thousands of years ago. Except for laboratory stockpiles, the variola virus has been eradicated in the world.

B. Clinical Description

Symptoms: There is a clinical spectrum of disease with smallpox. Smallpox occurs in two clinical forms: variola major and variola minor. Variola major causes a more severe form of smallpox, with a more extensive rash and higher fever. Variola major has four distinct syndromes: ordinary (the most frequent type, accounting for 90% or more of cases); modified (mild and occurring in previously vaccinated persons); flat; and hemorrhagic (rare and very severe). Historically, variola major has an overall fatality rate of about 30%; however, flat and hemorrhagic smallpox usually are fatal. Variola minor is a less common presentation of smallpox, and a much less severe disease, with death rates historically of 1% or less.

Onset: The **first symptoms** of smallpox include fever, malaise, head and body aches, and sometimes vomiting. The fever is usually high, in the range of 101^0 to 104^0 Fahrenheit. At this time, people are usually too sick to carry on their normal activities. This is called the *prodrome* phase and may last for 2 - 4 days.

A **rash emerges** first as small red spots on the tongue and in the mouth. These spots develop into sores that break open and spread large amounts of the virus into the mouth and throat. This is when the person is most contagious. Around the time the sores in the mouth break down, a rash appears on the skin, starting on the face and spreading to the arms and legs and then to the hands and feet. Usually the rash spreads to all parts of the body within 24 hours. As the rash appears, the fever usually falls and the person may start to feel better. By the third day of the rash, the lesions become raised bumps. By the fourth day, the bumps fill with a thick, opaque fluid and often have a depression in the center that looks like a bellybutton. (This is a major distinguishing characteristic of smallpox.) Fever often will rise again at this time and remain high until scabs form. The bumps become **pustules**—sharply raised, usually round and firm to the touch as if there's a small round object under the skin. People often say the bumps feel like BB pellets embedded in the skin. The pustules begin to form a crust and then **scab**. By the end of the second week after the rash appears most of the sores have scabbed over. The scabs begin to fall off, leaving marks on the skin that eventually becomes pitted **scars**. Most scabs will have fallen off three weeks after the rash appears. The person is contagious to others until all of the scabs have fallen off.

Complications: arthritis was a common complication, all others are rare. They may include secondary bacterial infection of skin lesions, sepsis, corneal ulceration and keratits, pulmonary edema, bronchopneumonia due to secondary bacterial infection, diarrhea, extensive viral infection of the intestinal mucous membrane, orchitis, hematuria, and encephalitis.

C. Reservoirs

Common reservoirs: Humans are the only natural reservoir for smallpox. However, in the aftermath of the events of September and October, 2001, there is heightened concern that the variola virus might be used as an agent of bioterrorism.

D. Modes of Transmission

Spread: Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from person to person.

Airborne: On rare occasions, smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses, and trains.

Person-to-person: Smallpox also can be spread through direct contact with infected bodily fluids, scabs of lesions, or contaminated objects such as bedding or clothing.

E. Incubation period

This incubation period averages about 12 - 14 days, but can range from 7 - 17 days.

F. Period of Communicability or Infectious Period

At about four days into illness a rash emerges first on the tongue and mouth and spreads to the rest of the body. A person is contagious from the time the rash appears until all the scabs have fallen off. This is approximately 3 weeks.

G. Epidemiology

Smallpox outbreaks had occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. After the disease was eradicated from the world, routine vaccination against smallpox among the general public was stopped because it was no longer necessary for prevention. Vaccination of healthcare response teams and the military against smallpox has been reinstated due to the potential use of smallpox as a biological weapon.

Except for laboratory stockpiles, the variola virus has been eliminated.

H. Bioterrorism Potential

Category A: There are concerns that the smallpox virus could be used for bioterrorism.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify individual cases and outbreaks as soon as possible.
- To assess the magnitude of the disease.
- To work in conjunction with law enforcement and homeland security to identify the source of cases as soon as possible.
- To put in place effective control or prevention methods. Please refer to state smallpox information at www.idph.state.ia.us/CADE/DiseaseIndex.aspx?disease=Smallpox

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider immediately report any suspected or confirmed case. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. If you are calling after business hours you may call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

Laboratory Testing Services Available

After communicating with IDPH, contact the University of Iowa State Hygienic Laboratory (SHL) at (319) 335-4500 for further instructions.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a) Case investigation of suspected smallpox disease in Iowa residents will be directed by the IDPH Center for Acute Disease Epidemiology (CADE).
b) Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report a suspected smallpox case immediately. Any suspected cases of smallpox should be reported immediately to IDPH, Center for Acute Disease Epidemiology (CADE) at (800) 362-2736. Instructions for reporting are given at this number after normal business hours.
c) Institution of disease control measures is an integral part of case investigation. It is the LPHA's responsibility to understand, and, if necessary, institute the control guidelines listed below.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

All suspect and known cases will be isolated at an appropriate site, which may include a healthcare facility or at home. When caring for smallpox patient adhere to Standard, Contact and Airborne Precautions. This includes an N 95 or better mask, goggles, gloves and gown and if hospitalized, a negative pressure room. All persons caring for smallpox patients should be vaccinated for smallpox.

All susceptible contacts will be in quarantine until an incubation period has passed. Quarantine orders will be issued by IDPH or the local public health agency. Release from quarantine will be done by written notice.

B. Protection of Contacts of a Case

Contacts of cases should be given smallpox vaccine as soon as possible, ideally within five days of exposure. This may prevent or reduce the severity of disease.

C. Managing Special Situations

If a suspect or known case of smallpox infection is reported in your county or if you suspect an outbreak, immediately consult with the epidemiologist on-call for CADE at (800) 362-2736. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several county lines and therefore be difficult to identify at a local level.

D. Preventive Measures

Environmental Measures

The best way to prevent smallpox is to vaccinate all those potentially exposed and susceptible. Refer to smallpox section of your local public health agency's bioemergency plan.

Preventive Measures/Education

People involved in smallpox response should

- Annually update knowledge about smallpox and response to an event.
- Maintain adequate numbers of trained key responders.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Smallpox can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

CDC Website. Smallpox www.bt.cdc.gov/agent/smallpox/index.asp

Heymann, D., L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC: American Public Health Association, 2008.

Additional Resources

CDC. Vaccines & Preventable Diseases: www.cdc.gov/vaccines/vpd-vac/default.htm

Iowa Dept. of Public Health. Smallpox website: www.idph.state.ia.us/CADE/DiseaseIndex.aspx?disease=Smallpox

FACT SHEET SMALLPOX

What is Smallpox?
Smallpox is a viral disease unique to humans. The last case of smallpox occurred in 1977 in Somalia.

How is the disease transmitted?
Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from person to person. On rare occasions smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses, and trains. Person-to-person spread can be through direct contact with infected bodily fluids. It can also be spread through contact with contaminated objects such as bedding or clothing.

If I am exposed to smallpox or have disease do I have to stay home?
If you have been in close contact to someone with smallpox you will receive smallpox vaccine as soon as possible and may be asked to stay home until 14 days after the last known exposure to a case. If you have disease, you will need to stay home or in a healthcare facility until all scabs have fallen off, usually around 21-28 days.

What are the symptoms of Smallpox?
The first symptoms may include high fever, fatigue, and head and backaches. A characteristic rash, most prominent on the face, arms, and legs, follows in 2-3 days. The rash starts with flat red lesions that appear at the same time. The lesions become pus-filled and begin to crust early in the second week. Scabs develop and then separate and fall off after about 3-4 weeks.

How soon do the symptoms appear?
Symptoms usually appear in about 12 days, but onset can range from 7 - 17 days.

How long is someone infectious?
A person can spread smallpox until all scabs have fallen off, usually about 21 – 28 days after rash appears.

What is the treatment for Smallpox?
There is no proven treatment for smallpox. Patients with smallpox can benefit from supportive therapy (intravenous fluids, medicine to control fever or pain, etc.) and antibiotics for any secondary bacterial infections that may occur.

Can I get vaccinated against Smallpox?
Routine vaccination for smallpox ended in 1972, since smallpox no longer naturally occurs in the world. Vaccination against smallpox is not recommended to prevent the disease in the general public and therefore is not available. However, if a person gets exposed to smallpox, there is vaccine available, and if given within 5 days after exposure, the vaccine can lessen the severity of or even prevent illness.

What if I have had the smallpox vaccine?
All persons are at risk for smallpox, even if they had the vaccine earlier in their lifetime.

How does my doctor tell the difference between smallpox and chickenpox?
The lesions that develop with smallpox develop at the same pace and appear identical. Chickenpox lesions develop in successive crops. The smallpox rash is most prominent on the face, arms, and legs, while the chickenpox rash is most prominent on the trunk.

Smallpox

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom:
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Variola virus

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Variola virus

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Variola virus

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms

Fever ☐ Yes ☐ No ☐ Unk Onset date: / / Duration: hrs/days Date returned to normal activities: / /
Cough ☐ Yes ☐ No ☐ Unk Onset date: / /
Runny nose ☐ Yes ☐ No ☐ Unk Onset date: / /
Red eyes w/t drainage ☐ Yes ☐ No ☐ Unk Onset date: / /
Diarrhea ☐ Yes ☐ No ☐ Unk Onset date: / /
Thrombocytopenia ☐ Yes ☐ No ☐ Unk Onset date: / /
Arthritis ☐ Yes ☐ No ☐ Unk Onset date: / /
Other complications: Describe:

Other symptoms

☐ Abdominal cramps
☐ Backache
☐ Chills
☐ Encephalitis
☐ Fatigue
☐ Fever
☐ Sore throat
☐ Vomiting
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Otitis media
☐ Photophobia

Rash: ☐ Yes ☐ No ☐ Unk Onset date: / / Duration: hours/days
Fever continued w/t rash: ☐ Yes ☐ No ☐ Unk Rash spreading: ☐ Yes ☐ No ☐ Unk
Rash equally distributed: ☐ Yes ☐ No ☐ Unk Rash appeared at once: ☐ Yes ☐ No ☐ Unk
Lesions present: ☐ Yes ☐ No ☐ Unk Rash initial location: ☐ Arms ☐ Face ☐ Legs ☐ Trunk ☐ Inside mouth

cm

# of days for first lesion to crust: days

Lesions in same stage of development: ☐ Yes ☐ No ☐ Unk

Rash characteristics: ☐ Burning ☐ Confluent lesions ☐ Could be felt (papule) ☐ Could not be felt (macule) ☐ Discrete lesions ☐ Distinct sharp borders ☐ Dusky brown ☐ Marked itching ☐ Numbness ☐ Painful ☐ Peeling skin ☐ Pustule ☐ Reddish ☐ Scaling/crusting

Heaviest lesion area: ☐ Arms ☐ Face ☐ Legs ☐ Trunk ☐ Scalp

Areas present: ☐ Inside mouth ☐ Palms ☐ Soles

Severity: ☐ < 50 lesions ☐ 50 – 249 lesions ☐ 250 – 500 lesions ☐ > 500 lesions

Koplik's spots: ☐ Yes ☐ No ☐ Unk

Healthcare provider visited: ☐ Yes ☐ No ☐ Unk

Date(s) visited: / / , / / , / /

Swollen lymph nodes: ☐ Yes ☐ No ☐ Unk

Location: _____

TREATMENT

Antivirals prescribed: ☐ Yes ☐ No ☐ Unknown

Antiviral: _____ Date started: / / Dose: _____ Unit: ☐ mg ☐ ml ☐ IU # of days: _____ # of times a day: _____ Route: _____

Antiviral: _____ Date started: / / Dose: _____ Unit: ☐ mg ☐ ml ☐ IU # of days: _____ # of times a day: _____ Route: _____

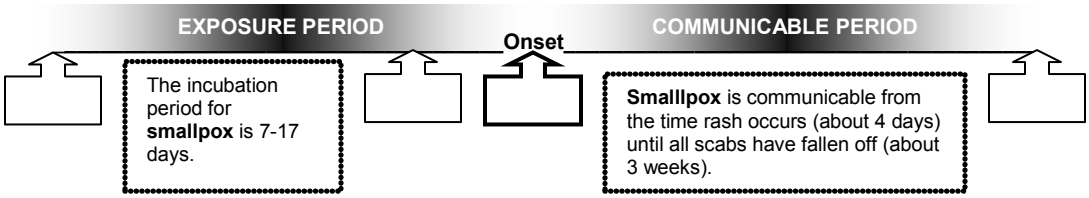
Antiviral: _____ Date started: / / Dose: _____ Unit: ☐ mg ☐ ml ☐ IU # of days: _____ # of times a day: _____ Route: _____

Therapeutic medications prescribed? ☐ Yes ☐ No ☐ Unk

List medications: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated for smallpox: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / / Lot #: _____ Vaccine type: _____ Manufacturer: _____

Date vaccinated: / / Lot #: _____ Vaccine type: _____ Manufacturer: _____

Date vaccinated: / / Lot #: _____ Vaccine type: _____ Manufacturer: _____

Number of vaccinations: ____

In the 17 days prior to the onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk City in Iowa: _____ Departure date: / / Return date: / /

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk State: _____ City: _____ Departure date: / / Return date: / /

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk Country: _____ Departure date: / / Return date: / /

Born outside the U.S.? ☐ Yes ☐ No ☐ Unknown Country outside the U.S.: _____

Immunocompromised? ☐ Yes ☐ No ☐ Unknown

In the 4 days after the onset of rash until about 3 weeks after the rash started:

Use public transportation: ☐ Yes ☐ No ☐ Unk

Date(s) used:	Time(s) used:	Type:	Route:
/ /			
/ /			
/ /			

Visit a doctor's office, clinic or hospitals: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Facility name: _____ Facility name: _____

Address: _____ Address: _____

Zip code: _____ City: _____ Zip code: _____ City: _____

State: _____ County: _____ State: _____ County: _____

Phone: ( )- - Type: _____ Phone: ( )- - Type: _____

Date visited: / / Time visited: _____ Date visited: / / Time visited: _____

Provider name: _____ Title: _____ Provider name: _____ Title: _____

Visit a public places: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Phone	Date(s) visited	Time visited
		( )- -	/ /	
		( )- -	/ /	
		( )- -	/ /	

Attend religious gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Attend family gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Attend other gatherings: ☐ Yes ☐ No ☐ Unknown

If Yes, complete the following table:

Location name	Address/City/State/Zip	Date(s) attended	Time attended	Describe interactions:
		/ /		
		/ /		
		/ /		

Setting Acquired:

Child care ☐ Yes ☐ No ☐ Unk	Hospitalized ☐ Yes ☐ No ☐ Unk	Home ☐ Yes ☐ No ☐ Unk
Church ☐ Yes ☐ No ☐ Unk	International traveler ☐ Yes ☐ No ☐ Unk	School ☐ Yes ☐ No ☐ Unk
College ☐ Yes ☐ No ☐ Unk	Military ☐ Yes ☐ No ☐ Unk	Urgent care ☐ Yes ☐ No ☐ Unk
Correctional Facility ☐ Yes ☐ No ☐ Unk	Hospital ER/ Outpatient ☐ Yes ☐ No ☐ Unk	Work ☐ Yes ☐ No ☐ Unk
Doctors office ☐ Yes ☐ No ☐ Unk		Other

Disease traced within 2 generations of known international import? ☐ Yes ☐ No ☐ Unk

CONTACTS

Number of people living in case's household: ____

Close contacts of the case (For more than one contact, print/copy additional contact pages.)

Last name: _____ Address: _____

First name: _____ City/State/Zip: _____ County: _____

DOB: / / Age: _____ Phone: _____ Type: _____

Gender: ☐ Female ☐ Male ☐ Other Symptoms present: ☐ Yes ☐ No ☐ Unk Onset date: / /

If this contact has an onset date before this case then create a new case and event.

Symptoms:

Fever ☐	Onset date: / /		Vomiting ☐	Onset date: / /	
Runny nose ☐	Onset date: / /		Cough ☐	Onset date: / /	
Rash ☐	Onset date: / /		Red eyes w/t discharge ☐	Onset date: / /	
Chills ☐	Onset date: / /		Backache ☐	Onset date: / /	
Fatigue ☐	Onset date: / /		Encephalitis ☐	Onset date: / /	
Joint pain ☐	Onset date: / /		Headache ☐	Onset date: / /	
Nausea ☐	Onset date: / /		Muscle pain ☐	Onset date: / /	
Photophobia ☐	Onset date: / /		Otitis media ☐	Onset date: / /	
Sore throat ☐	Onset date: / /		Pneumonia ☐	Onset date: / /	
			Swollen lymph nodes ☐	Onset date: / /	

NOTES: _____

FACT SHEET Vancomycin-Resistant *Staphylococcus aureus* VRSA

What is *Staphylococcus aureus*

Staphylococcus aureus, often simply referred to a "staph," are bacteria (germs) commonly found on the skin and in the noses of healthy people. Occasionally, staph can cause infection. Staph bacteria are one of the most common causes of skin infections in the U.S. Most of these infections are minor (such as pimples, boils, and other skin conditions) and can be treated without antibiotics. Staph bacteria can also cause serious and sometimes fatal infections, such as bloodstream infections, surgical wound infections, and pneumonia. In the past, most serious infections were treated with a type of antibiotic related to penicillin. Over the past 50 years, treatment of these infections has become more difficult because staph bacteria have become resistant to various antibiotics, including the commonly used penicillin-related antibiotics.

What are VISA and VRSA?

Vancomycin intermediate *Staph aureus* (VISA) and vancomycin resistant staph aureus (VRSA) are specific types of antibiotic-resistant staph bacteria. While most staph bacteria are susceptible to the antibiotic vancomycin, some have developed resistance. VISA and VRSA cannot be successfully treated with vancomycin because it no longer kills them. To date all VISA and VRSA infections have been susceptible to other antibiotics.

Who gets VISA and VRSA infections?

Persons that have developed VISA and VRSA infections often have had several other health problems such as diabetes and kidney disease, previous infections with methicillin-resistant *Staphylococcus aureus* (MRSA), tubes going into their bodies such as intravenous (IV) catheters, recent hospitalizations, and recently been given vancomycin and other antibiotics.

What should I do if I think I have a Staph, MRSA, VISA, or VRSA infection?

See your healthcare provider.

Are VISA and VRSA infections treatable?

Yes. To date, all VISA and VRSA infections have been susceptible to several other antibiotics.

How can the spread of VISA and VRSA be prevented?

Use of appropriate infection control practices, like wearing gloves when caring for someone with VISA or VRSA and washing hands with plain or antimicrobial soap after removing gloves, by anyone caring for someone infected can reduce the spread of VISA and VRSA.

SYPHILIS

Also known as: Syph, the pox, bad blood

Responsibilities:
Hospital: Report by mail or phone
Lab: by mail
Physician: Report by mail or phone
Local Public Health Agency (LPHA): Follow-up Iowa Department of Public Health

Iowa Department of Public Health
Sexually Transmitted Disease Reporting: (515) 281-3031

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Syphilis is a sexually transmitted disease (STD) caused by the bacterium *Treponema pallidum*, subspecies pallidum, a spirochete. It has often been called "the great imitator" because so many of the signs and symptoms are indistinguishable from those of other diseases.

B. Clinical Description

- Primary Stage: The primary stage of syphilis is usually marked by the appearance of a single sore (called a chancre) at the site of infection. Primary lesions are not confined to the genital area; they may be seen on the lips, tongue, tonsils, nipples, fingers, anus, or other area that comes in contact with the infection. The chancre may not be visible if inside the vagina, anus or mouth. The time between infection with syphilis and the start of the first symptom can range from 10 to 90 days (average 21 days). The chancre is usually firm, round, small and painless. The chancre lasts 3 to 6 weeks and it heals without treatment. However, if adequate treatment is not administered, the infection progresses to the secondary stage.

- Secondary Stage: Skin rash and mucous membrane lesions characterize the secondary stage. This stage typically starts with the development of a rash on one or more areas of the body. The rash usually does not cause itching. Rashes associated with secondary syphilis can appear as the chancre is healing or several weeks after the chancre has healed. The characteristic rash of secondary syphilis may appear as rough, red or reddish brown spots both on the palms of the hands and the soles of the feet. However, rashes with a different appearance may occur on other parts of the body, sometimes resembling rashes caused by other diseases. Sometimes rashes associated with secondary syphilis are so faint that they may not be noticed. Other symptoms of secondary syphilis may include fever, swollen lymph glands, sore throat, patchy hair loss, headaches, weight loss, muscle aches and fatigue. These symptoms may last 2 - 6 weeks (4 weeks average) and they may recur. The signs and symptoms of secondary syphilis will resolve with or without treatment, but without treatment, the infection will progress to the latent and late stages of disease.

- Latent/Late Stage: Latent syphilis is the stage in which no observable clinical signs or symptoms are present to suggest infection, yet the serologic tests for syphilis are reactive. The latent stage of syphilis begins when secondary symptoms disappear. Early latent syphilis is defined as latent disease within the first year after infection. Late latent infection is when more than a year has passed since the patient became infected and there are no signs of disease. The reason for separating latent stages into early and late is that secondary relapses generally do not occur following the first year and that early latent disease it treated with a single dose of long acting benzathine penicillin vs. three doses for late latent disease. Without treatment, the bacteria

remain in the body even though there may be no clinical signs and symptoms. In the late stages of syphilis, it may subsequently damage the internal organs, including the brain, nerves, eyes, heart, blood vessels, liver, bones and joints. This internal damage may show up many years later. Signs and symptoms of the late stage of syphilis include difficulty coordinating muscle movements, paralysis, numbness, gradual blindness, deafness and dementia. This damage may be serious enough to cause death. For more information on neurosyphilis, cardiovascular syphilis, and other late stage syphilis, please contact the Sexually Transmitted Disease Program at 515-281-3031, or see the Centers for Disease Control and Prevention's STD Treatment Guidelines 2010 for more information: www.cdc.gov/std/treatment/2010/default.htm

- Onset

  Primary – 10 to 90 days (average 21 days)
  Secondary – 6 weeks to 6 months
  Early Latent – 6 months to 1 year
  Late Latent – More than one year after infection
  Late Stage – Years after initial infection

- Complications Pregnant women **MUST** be treated with long-acting benzathine penicillin during pregnancy to reduce the risk of transmitting the infection to their unborn children. Please see the Centers for Disease Control and Prevention's STD Treatment Guidelines 2010 for more information: www.cdc.gov/std/treatment/2010/default.htm

C. Reservoirs

Common reservoirs: Humans.

D. Modes of Transmission

Spread: By direct contact with infectious exudates from obvious or concealed, moist, early lesions of skin and mucous membranes of infected people during sexual contact, most often in the primary stage of infection. Transmission by kissing occurs rarely. Transplacental infection of the fetus occurs during the pregnancy of an infected woman.

Rarely, transmission can occur through blood transfusion if the donor is in the early stages of disease. Blood donations are screened for syphilis, but early infections may not show up on screening tests. Infection by contact with contaminated articles may be theoretically possible but is extraordinarily rare. Health professionals have developed primary lesions on the hands following clinical examination of infectious lesions.

E. Incubation period

Primary syphilis - from 10 days to 3 months, usually 3 weeks.

F. Period of Communicability or Infectious Period

Communicability exists when moist mucocutaneous lesions of primary and secondary syphilis are present. However, the distinction between the infectious primary and secondary stages and the noninfectious early latent stage of syphilis is somewhat arbitrary with regard to communicability, since primary and secondary stage lesions may not be apparent to the infected individual. The lesions of secondary syphilis may recur with decreasing frequency up to four years after infection. However, transmission of infection is rare after the first year. Consequently, in the United States infectious early syphilis is usually defined as ending after the first year of infection.

Transmission of syphilis from mother to fetus is most probable during early maternal syphilis but can occur throughout the latent period. Infected infants may have moist mucocutaneous lesions that are more widespread than in adult syphilis and are a potential source of infection.

G. Epidemiology

In the United States, health officials reported 46,042 cases of syphilis in 2011, including 13,970 cases of primary and secondary (P&S) syphilis. Cases among males, and particularly among men who have sex with men (MSM), have increased since 2000. The rate of P&S syphilis increased 3.8% among men (from 7.9 cases to 8.2 cases per 100,000 men) between 2010 and 2011. These cases have been associated with high rates of HIV co-infection and high-risk sexual behavior. Case rates are lower among women; the rate of P&S syphilis decreased 9.1% among women from 2010 to 2011, from 1.1 to 1.0 cases per 100,000 women. Finally, after an increase of 18% during 2006-2008, the overall rate of congenital syphilis decreased, from 10.5 to 8.5 cases per 100,000 live births during 2008-2011. This decrease in the rate of congenital syphilis likely reflects the decrease in the rate of P&S syphilis among women during 2008-2011.

The number of syphilis cases in Iowa is increasing as well. Total syphilis case numbers increased from 29 in 2005 to 70 in 2011. Healthcare providers should be vigilant to watch for signs of primary and secondary syphilis, and take care to conduct thorough social history, including travel and sexual activity in high syphilis incidence areas.

H. Bioterrorism Potential:

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To interrupt disease transmission, the Iowa Department of Public Health (IDPH) provides partner counseling and referral services for persons recently diagnosed with syphilis infection, and their exposed partner(s).
- To monitor trends in syphilis diagnoses so that prevention and treatment funds may be targeted efficiently, and prevention programs may be evaluated.
- To monitor perinatal exposures to syphilis infection and morbidity in infants born to syphilis-infected women.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139A) stipulates that the laboratory and healthcare providers must report syphilis. Laboratory personnel should forward results of tests directly to the Iowa Department of Public Health.

All confirmed laboratory diagnoses of syphilis are to be reported to the IDPH STD Program by mail or phone.

Healthcare Providers must complete an "Iowa Confidential Report of Sexually Transmitted Diseases and HIV Infection" morbidity report within 3 days of diagnosing a positive syphilis infection. Healthcare Providers are to provide a date of birth, home address, phone number and treatment information on each reported case. Providers should also report any partner information that is available, including treatment information for the partners.

Laboratory personnel should forward results of tests directly to the IDPH STD Program. "Iowa Confidential Report of Sexually Transmitted Diseases and HIV Infection," "Laboratory Report of Tests Processed for STD," and postage paid envelopes (coded #00) are available at the clearinghouse at http://healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=303 . Send completed reports to the address below:

Iowa Department of Public Health
STD Program (#00)
321 East 12th Street, 5th Floor
Des Moines, IA 50319-0075

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

Partner notification and referral services will be provided by Disease Prevention Specialists employed by the IDPH, or by Black Hawk, Linn, Polk, or Scott county health departments.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

The IDPH will initiate the partner notification program with all persons who are newly diagnosed with syphilis infection. Healthcare providers can facilitate this process by describing the program to the patient and encouraging the patient to meet with the disease prevention specialist assigned to his or her region.

Patients' names and times of exposures are not used in the notification of partners. Syphilis testing is offered to all partners free of charge and appropriate referrals to other services are provided during the partner counseling sessions.

Physicians should assist the disease prevention specialists with the collection of partner information for notification. In such cases, the physician should collect the following information: Partner name, address, home phone number, age and/or date of birth, race, sex, partner/marital status, height, size/build, general description of the partner, and dates of first and last exposure. Any other information that may help in locating and counseling the partner may also be included, such as medical conditions, place of employment, cell phone numbers, or other unusual circumstances/ situations.

C. Managing Special Situations

Occupational Exposures

None.

Reported Incidence Is Higher than Usual/Outbreak Suspected

Report unusual cases to the Iowa Department of Public Health at (515) 281-3031.

D. Preventive Measures

Preventive Measures/Education

Risk reduction counseling/education and testing should be offered to all persons with risk factors for syphilis infection and transmission.

The best way to avoid transmission of sexually transmitted diseases is to abstain from sexual contact, or to be in a long-term mutually monogamous relationship with a partner who has been tested and is known to be uninfected.

Latex male condoms for vaginal, oral or anal sex, when used consistently and correctly, can reduce the risk of transmission of syphilis.

The Centers for Disease Control STD Treatment Guidelines provide specific recommendations for STD prevention services that should be provided for all sexually active men who have sex with men (MSM). www.cdc.gov/std/treatment/2010/default.htm The first recommendation for this population is that STD screening be performed at least annually.

Any genital symptoms such as an unusual sore or rash should be a sign to stop having sex and consult a healthcare provider immediately. If a person has been diagnosed with syphilis (or any other STD), he or she must notify all recent sex partners so they can see a healthcare provider and

be treated. The person and all of his or her sex partners must avoid sex until they have completed their treatment for syphilis. Disease prevention specialists will assist infected patients with this process.

In addition to treatment for syphilis, an infected patient should be tested for other sexually transmitted diseases including HIV.

See
http://hivtest.cdc.gov/STDTesting.aspx
for a current list of sites which can provide STD testing, as well as HIV testing and counseling.

For information on STD/HIV testing sites, please call the Iowa Department of Public Health STD Program at 515-281-3031.

4) ADDITIONAL INFORMATION

Laboratory criteria for diagnosis

Darkfield examinations and direct fluorescent antibody tests of lesion exudates or tissue are the definitive methods for diagnosing early syphilis. A presumptive diagnosis is possible with the use of two types of serologic tests for syphilis: a) nontreponemal tests (e.g., Venereal Disease Research Laboratory [VDRL] and Rapid Plasma Reagin [RPR]) and b) treponemal tests (e.g., fluorescent treponemal antibody absorbed [FTA-ABS] and T. pallidum particle agglutination [TP-PA]). The use of only one type of serologic test is insufficient for diagnosis, because false-positive nontreponemal test results may occur secondary to various medical conditions.

Nontreponemal test antibody titers usually correlate with disease activity, and results should be reported quantitatively. A fourfold change in titer, equivalent to a change of two dilutions (e.g., from 1:16 to 1:4 or from 1:8 to 1:32), is considered necessary to demonstrate a clinically significant difference between two nontreponemal test results that were obtained using the same serologic test. Sequential serologic tests in individual patients should be performed by using the same testing method (e.g., VDRL or RPR), preferably by the same laboratory. The VDRL and RPR are equally valid assays, but quantitative results from the two tests cannot be compared directly because RPR titers often are slightly higher than VDRL titers. Nontreponemal tests usually become nonreactive with time after treatment; however, in some patients, nontreponemal antibodies can persist at a low titer for a long period of time, sometimes for the life of the patient. This response is referred to as the “serofast reaction.”

Most patients who have reactive treponemal tests will have reactive tests for the remainder of their lives, regardless of treatment or disease activity. However, 15%-25% of patients treated during the primary stage revert to being serologically nonreactive after 2-3 years. Treponemal test antibody titers correlate poorly with disease activity and should not be used to assess treatment response.

Case Definitions

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Syphilis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Treatment

Long acting Penicillin G, administered parenterally, is the preferred drug for treatment of all stages of syphilis. The preparation(s) used (i.e., benzathine, aqueous procaine, or aqueous crystalline), the dosage, and the length of treatment depend on the stage and clinical manifestations of disease.

However, neither combinations of benzathine penicillin and procaine penicillin nor oral penicillin preparations are considered appropriate for the treatment of syphilis.

The efficacy of penicillin for the treatment of syphilis was well established through clinical experience before the value of randomized controlled clinical trials was recognized. Therefore, almost all the recommendations for the treatment of syphilis are based on the opinions of persons knowledgeable about STDs and are reinforced by case series, clinical trials, and 50 years of clinical experience.

For treatment information related to the stages of syphilis, recommended dosage, and special considerations, please refer to the 2010 CDC STD Treatment Guidelines.
www.cdc.gov/std/treatment/2010/default.htm

References

Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2007 Supplement, Syphilis Surveillance Report.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, March 2009.

Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines 2010. MMWR 2010; 59, RR-12 www.cdc.gov/std/treatment/2010/default.htm

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Notification And Surveillance of Reportable Communicable and Infectious Diseases, Poisonings and Conditions. Iowa Code 2003 Section 139A.

Additional Resources

CDC website with most current guidelines for prevention, surveillance, and treatment:
www.cdc.gov/std/syphilis/default.htm

HIV/AIDS Program web site, Iowa Department of Public Health.
www.idph.state.ia.us/HivStdHep/

CDC Factsheet
www.cdc.gov/std/Syphilis/STDFact-Syphilis.htm

Syphilis and Men Who Have Sex With Men (MSM)
www.cdc.gov/std/syphilis/STDFact-MSM-Syphilis.htm

The National Plan to Eliminate Syphilis from the United States
www.cdc.gov/stopsyphilis/plan.htm

FACT SHEET SYPHILIS

For Health Professionals

What is Syphilis?

Syphilis is a sexually transmitted disease (STD) caused by the bacteria *Treponema pallidum*. It has often been called "the great imitator" because so many of the signs and symptoms are indistinguishable from those of other diseases.

How common is Syphilis?

In the United States, health officials reported 46,042 cases of syphilis in 2011, including 13,970 cases of primary and secondary (P&S) syphilis. Cases among males, and particularly among men who have sex with men (MSM), have increased since 2000. The rate of P&S syphilis increased 3.8% among men (from 7.9 cases to 8.2 cases per 100,000 men) between 2010 and 2011. These cases have been associated with high rates of HIV co-infection and high-risk sexual behavior. Case rates are lower among women; the rate of P&S syphilis decreased 9.1% among women from 2010 to 2011, from 1.1 to 1.0 cases per 100,000 women. Finally, after an increase of 18% during 2006-2008, the overall rate of congenital syphilis decreased, from 10.5 to 8.5 cases per 100,000 live births during 2008-2011. This decrease in the rate of congenital syphilis likely reflects the decrease in the rate of P&S syphilis among women during 2008-2011.

The number of syphilis cases in Iowa is increasing as well. Total syphilis case numbers increased from 29 in 2005 to 70 in 2011.

How do people get syphilis?

Syphilis is passed from person to person through direct skin-to-skin contact with a syphilis sore. Sores occur mainly on the external genitals (private areas), vagina, anus, or in the rectum. Sores also can occur on the lips and in the mouth. Transmission of the organism occurs during vaginal, anal, or oral sex. Pregnant women with the disease can pass it to the babies they are carrying. Syphilis cannot be spread through contact with toilet seats, doorknobs, swimming pools, hot tubs, bathtubs, shared clothing, or eating utensils.

What are the signs and symptoms in adults?

Many people infected with syphilis do not have any symptoms for years, yet remain at risk for late complications if they are not treated. Although transmission appears to occur from persons with sores who are in the primary or secondary stage, many of these sores are unrecognized. Thus, most transmission is from persons who are unaware of their infection.

Primary Stage -The primary stage of syphilis is usually marked by the appearance of a single sore (called a chancre), but there may be multiple sores. The time between infection with syphilis and the start of the first symptom can range from 10 to 90 days (average 21 days). The sore is usually firm, round, small, and painless. It appears at the spot where syphilis bacteria entered the body. The sore lasts 3 to 6 weeks, and it heals without treatment. However, if proper treatment is not administered, the infection progresses to the secondary stage.

Secondary Stage - A skin rash and sores in the mouth or private areas will begin in the secondary stage. This stage usually starts with the development of a rash on one or more areas of the body. The rash usually does not cause itching. Rashes associated with secondary syphilis can appear as the primary sore is healing or several weeks after the sore has healed. The usual rash of secondary syphilis appears to be rough, red, or reddish brown spots on the palms of the hands and the bottoms of the feet. However, rashes with a different appearance may occur on other parts of the body, sometimes resembling rashes caused by other diseases. Sometimes rashes associated with

secondary syphilis are so faint that they are not noticed. In addition to rashes, symptoms of secondary syphilis may include fever, swollen glands, sore throat, patchy hair loss, headaches, weight loss, muscle aches, and fatigue. The signs and symptoms of secondary syphilis will go away with or without treatment, but without treatment, the infection will progress to the latent and late stages of disease.

Late Stage - The latent (hidden) stage of syphilis begins when secondary symptoms (the rash) disappear. Without treatment, the infected person will continue to have syphilis even though there are no signs or symptoms; the infection remains in the body. In the late stages of syphilis, it may damage the internal organs, including the brain, nerves, eyes, heart, blood vessels, liver, bones, and joints. This internal damage may show up many years later. Signs and symptoms of the late stage of syphilis include difficulty with muscle movements, paralysis, numbness, gradual blindness, and memory loss. This damage may be serious enough to cause death.

How does syphilis affect a pregnant woman and her baby?

The syphilis bacteria can infect the baby of a woman during her pregnancy. Depending on how long a pregnant woman has been infected, she may have a high risk of having a stillbirth (a baby born dead) or of giving birth to a baby who dies shortly after birth. An infected baby may be born without signs or symptoms of disease. However, if not treated immediately, the baby may develop serious problems within a few weeks. Untreated babies may become developmentally delayed, blind, deaf, have seizures, or die. Pregnant women **MUST** be treated with long-acting benzathine penicillin during pregnancy to reduce the risk of transmitting the infection to their unborn child. Please see the Centers for Disease Control and Prevention STD Treatment Guidelines 2010 for more information: www.cdc.gov/std/treatment/2010/default.htm.

How is syphilis diagnosed?

A blood test is the usual way to determine whether someone has syphilis. Shortly after infection occurs, the body produces a response to the syphilis bacteria, called antibodies. The antibodies can be detected by an accurate, safe, and inexpensive blood test. A low level of antibodies will stay in the blood for months or years even after the disease has been successfully treated. Because untreated syphilis in a pregnant woman can infect and possibly kill her developing baby, every pregnant woman should have a blood test for syphilis.

What is the link between syphilis and HIV?

Genital sores caused by syphilis make it easier for syphilis to enter the body and for a person to acquire HIV infection sexually. Having other STDs is also an important predictor for becoming HIV infected, because STDs are acquired by having unprotected sex.

What is the treatment for syphilis?

Syphilis is easy to cure in its early stages. A single injection of penicillin, an antibiotic, will cure a person who has had syphilis for less than a year. Additional doses are needed to treat someone who has had syphilis for longer than a year. For people who are allergic to penicillin, other antibiotics are available to treat syphilis. However, if a woman is pregnant and is allergic to penicillin, she must see her doctor so they can treat the allergy, because she must be treated with penicillin so her baby is not infected. There are no home remedies or over-the-counter drugs that will cure syphilis. Treatment will kill the syphilis bacteria and prevent further damage, but it will not repair damage that has already occurred.

Because effective treatment is available, it is important that persons be screened for syphilis on an on-going basis if they participate in unprotected sex.

Persons who receive syphilis treatment must abstain from sexual contact with new partners until the syphilis sores are completely healed. Persons with syphilis must notify their sex partners so that they also can be tested and receive treatment if necessary.

Will syphilis recur?

Having syphilis once does not protect a person from getting it again. Following successful treatment, people can still be susceptible to re-infection. Only laboratory tests can confirm whether someone has syphilis. Because syphilis sores can be hidden inside the mouth or private areas, it may not be obvious that a sex partner has syphilis. Talking with a healthcare provider will help to determine the need to be re-tested for syphilis after treatment has been received.

How can syphilis be prevented?

- The surest way to avoid transmission of sexually transmitted diseases, including syphilis, is to abstain from sexual contact or to be in a long-term mutually monogamous relationship with a partner who has been tested and is known to not have syphilis.
- Avoiding alcohol and drug use may also help prevent transmission of syphilis because these activities may lead to risky sexual behavior. It is important that sex partners talk to each other about their HIV status and history of other STDs so that preventive action can be taken.
- Sores from STD's, like syphilis, can occur in both the male and female private areas. You can prevent contact with the sore by using a latex condom. Correct and consistent use of latex condoms can reduce the risk of syphilis, genital herpes and other STD's, only when the infected area or site of potential exposure is protected.
- Condoms lubricated with spermicides (especially Nonoxynol-9 or N-9) are no more effective than other lubricated condoms in protecting against the transmission of STDs. Based on findings from several research studies, N-9 may itself cause genital lesions, providing a point of entry for HIV and other STDs. In June 2001, the CDC recommended that N-9 not be used as a microbicide or lubricant during anal intercourse.
- Transmission of a STD, including syphilis cannot be prevented by washing the genitals, urinating, and or douching after sex. Any unusual discharge, sore, or rash, particularly in the groin area, should be a signal to refrain from having sex and to see a doctor immediately.

Where can I get more information?

Iowa Department of Public Health STD Program
www.idph.state.ia.us/HivStdHep/

Division of STD Prevention (DSTDP)
Centers for Disease Control and Prevention
www.cdc.gov/std

Personal health inquiries and information about STDs:
CDC National STD and AIDS Hotlines
(800) 227-8922 or (800) 342-2437
En Espanol (800) 344-7432
TTY for the Deaf and Hard of Hearing (800) 243-7889

STD Treatment Guidelines:
Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines 2010.

TETANUS

Also known as: Lockjaw disease

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by facsimile, mail or phone
Physician: Report by IDSS, facsimile, mail or phone
Local Public Health Agency (LPHA): Report by IDSS, mail, facsimile, or phone. Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Tetanus is caused by a potent toxin produced by *Clostridium tetani,* a spore-forming, anaerobic, gram-positive bacillus.

B. Clinical Description

Generalized tetanus is an acute, often fatal neurologic disease characterized by painful skeletal muscular contractions. The toxin blocks nerve signals telling muscles not to contract in response to voluntary contractions of opposing muscles. Onset is gradual, occurring over 1 - 7 days. The muscle stiffness usually first involves the jaw (lockjaw) and neck and progresses to severe generalized muscle spasms, which frequently are aggravated by any external stimulus, such as a loud noise. Severe spasms persist for one week or more and subside over a period of weeks in those who recover. *C. tetani* usually enters the body through a penetrating or puncture wound. In the presence of anaerobic (low oxygen) conditions, the spores germinate. Toxins are produced, and disseminated via blood and lymphatics. Toxins act at several sites within the central nervous system, including peripheral motor end plates, spinal cord, brain, and sympathetic nervous system. The typical clinical manifestations of tetanus are caused when tetanus toxin interferes with release of neurotransmitters, which block inhibitor impulses, resulting in sustained spasms. This leads to unopposed muscle contraction and spasm. Seizures may occur, and the autonomic nervous system may also be affected.

Neonatal tetanus, which arises from infection of the umbilical stump, is a form of generalized tetanus. However, inability to nurse is the most common presenting sign. Localized tetanus is manifested by local muscle spasms in areas contiguous to a wound, although history of an injury or an apparent portal of entry may be lacking. Cephalic tetanus is a rare form of the disease and involves the cranial nerves, especially the facial area. It is associated with infected wounds of the head and neck, including ear infections. Both localized and cephalic tetanus may precede generalized tetanus.

Complications of the disease include laryngospasm (spasm of the vocal cords) and/or spasm of the muscles of respiration, leading to interference with breathing; fractures of the spine or long bones, resulting from sustained contractions and convulsions; and hyperactivity of the autonomic nervous system, which may lead to hypertension and/or an abnormal heart rhythm. Other complications may include increased susceptibility to nosocomial infections, pulmonary embolism (particularly in drug addicts and elderly patients), and aspiration pneumonia. The case-fatality rate ranges from 10% - 90%; it is highest in infants and the elderly and varies inversely with the length of the incubation period and the availability of experienced intensive care unit personnel and resources.

Tetanus disease does not confer immunity. Patients who survive the disease should be given a complete series of vaccine.

Laboratory confirmation is of little help. The organism is rarely recovered from the site of infection, and usually there is no detectable serological response.

C. Reservoirs

Clostridium tetani is a normal inhabitant of soil and animal and human intestines. It is ubiquitous in the environment, especially where contamination by excreta is frequent.

D. Modes of Transmission

There is **no** person-to-person transmission of tetanus. Wounds, recognized or unrecognized, are the sites at which the organism enters the body, multiplies, and produces toxin. Cases of tetanus have followed injuries considered too trivial for medical consultation.

E. Incubation period

The incubation period ranges from 2 days to months, with most cases occurring within 14 days. In neonates the incubation period is usually 5 - 14 days. In general, shorter incubation periods are associated with more heavily contaminated wounds, more severe disease, and a worse prognosis.

F. Period of Communicability or Infectious Period

There is no infectious period because tetanus in not transmitted person-to-person.

G. Epidemiology

Tetanus occurs worldwide and is more frequent in warmer climates and months, partly because of the frequency of contaminated wounds. Despite the availability of tetanus toxoid (TT), tetanus continues to have a substantial health impact in the world. In 1997, neonatal tetanus alone accounted for an estimated 277,400 deaths worldwide. Tetanus is sporadic and relatively uncommon in the United States and most industrial countries, mostly because of widespread use of tetanus toxoid as part of routine immunizations and improved wound management. During 2001 through 2008, the last years for which data have been compiled, a total of 233 tetanus cases was reported, an average of 29 cases per year. Among the 197 cases with known outcomes the case-fatality rate was 13%. Almost all reported cases have occurred in people who had never been vaccinated or who completed a primary series but had not had a booster dose in the preceding 10 years. In the U.S., 49% tetanus cases occurred in persons 50 years of age or older. Neonatal tetanus is rare in the U.S., with only two cases reported since 1989. Neither of the infants' mothers had ever received tetanus toxoid.

Heroin users, particularly those who inject themselves subcutaneously with quinine-cut heroin, appear to be at high risk for tetanus. Quinine is used to dilute heroin and may actually favor growth of *C. tetani*.

During 1995–97, acute injuries such as punctures, lacerations, and abrasions accounted for 64% of reported cases of tetanus in the U.S. Approximately one-third of all reported cases were not due to acute injury, and some had no known injury at all. Today, tetanus in the U.S. affects primarily older adults. The last reported case of neonatal tetanus in the U.S. occurred in 1998 in Montana in a newborn whose umbilical stump had been treated with nonsterile clay. The last case in Iowa was in 2000. From 1994 through 2006, Iowa had 5 cases of tetanus reported, 2 of which were known to be fatal. Both fatalities were elderly women who had never received Td vaccine. Elderly women may be at greater risk of illness and death because they may never have received vaccine. Males often were vaccinated in the military, thus may at least have some protection.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To assure early evaluation and, where appropriate, treatment with tetanus-diphtheria toxoid (Td) and/or tetanus immune globulin (TIG) and hospitalization.
- To identify groups and areas in which risk of disease is highest (due to under-immunization, occupation, other practices, etc.) to initiate prevention efforts, such as catch-up vaccination.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

C. Local Public Health Agency Follow-up Responsibilities

With assistance from the hospital infection preventionist, complete an investigation using the Iowa Disease Surveillance System (IDSS). The following data are epidemiologically important and should be collected in the course of case investigation. Additional information may be collected at the direction of IDPH.

Demographic information:
Name, Address, State of residence, Date of birth, Age, Sex, Ethnicity, Race, Occupation

Reporting Source:
County, Earliest date reported

Clinical:
Hospitalization and duration of stay, Date of onset of symptoms, Type of tetanus disease, Wound location and management, Complications, Pre-existing conditions (e.g., diabetes, chronic otitis media), Outcome (case survived or died), Date of death

Treatment:
Prophylaxis with Td and TIG, Date started,

Vaccine Information:
Dates of vaccination (prior tetanus toxoid history including Td, Tdap, etc), Time since last dose of tetanus-containing vaccine, Manufacturer of vaccine, Lot number, If not vaccinated, reason

Epidemiological:
Risk factors for disease such as history of a wound or injury, recent injection drug use, tattooing, or body piercing

For neonatal cases, maternal country or origin and number of years of residence in the U.S.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

No immunization or prophylaxis is necessary for contacts of a case. If the patient is hospitalized, Standard Precautions should be used.

C. Preventive Measures

Personal Preventive Measures/Education

Vaccination, including routine childhood vaccination and tetanus-containing boosters beginning at age 11–12 years and continuing every 10 years thereafter, is the best preventive measure against tetanus. (Note: Tdap is recommended as a booster at age 11-12) Diphtheria-containing formulations should always be used and one dose with acellular pertussis vaccine . The Advisory Committee on Immunization Practices (ACIP) recommends that all children receive a routine series of five doses of tetanus- and diphtheria-containing vaccine at ages 2, 4, 6,and 15-18 months followed by a booster at 4-6 years of age. Booster doses of diphtheria and tetanus toxoids should be administered beginning at age 11–12 years (Tdap) (provided at least 5 years have passed since the last dose) and every 10 years thereafter (Td). DTaP and DT should be used in persons < 7 years of age, whereas Td is the preferred preparation for persons $\geq$ 7 years of age. The Td catch-up schedule for those starting immunization at $\geq$ 7 years of age consists of 3 doses. The second dose is usually given 1–2 months after the first dose, and the third dose 6 months after the second dose.

There are four vaccines used to prevent diphtheria, tetanus and pertussis: DTaP, Tdap, DT, and Td. Two of these (DTaP and DT) are given to children younger than 7 years of age, and two (Tdap and Td) are given to older children and adults. Several other combination vaccines contain DTaP along with other childhood vaccines. Children should get 5 doses of DTaP, one dose at each of the following ages: 2, 4, 6, and 15-18 months and 4-6 years. DT does not contain pertussis, and is used to complete the series if a child has a valid contraindication to pertussis vaccine. Td is a tetanus-diphtheria vaccine given to adolescents and adults as a booster shot every 10 years, or after an exposure to tetanus. Tdap is similar to Td but also contains protection against pertussis. A single dose of Tdap is recommended to replace one dose of Td. Tdap is licensed for ages 10 through 64 years. Healthcare providers and the public must be educated on the necessity of primary immunization with tetanus-diphtheria toxoid and 10-year booster doses; the hazards of puncture wounds and closed injuries, and the potential need after injury for active and/or passive prophylaxis. Because tetanus is preventable, each case should be considered a failure to vaccinate and should be used as a means of determining how to prevent further failures from occurring. Surveillance information should be used to raise awareness of the importance of immunization and to characterize persons or places in which additional efforts are required to raise immunization levels and decrease disease incidence.

Tetanus prophylaxis in patients with wounds is based on careful assessment of whether the wound is clean or contaminated, the immunization status of the patient, proper use of tetanus toxoid and/or TIG, wound cleaning and where required, surgical debridement and proper use of antibiotics.

Table 1. Guide to Tetanus Prophylaxis in Routine Wound Management

Vaccination History	Clean minor wounds		All other wounds [a]	
	Td*[b]	TIG[c]	Td*	TIG[c]
Unknown or < 3	Yes	No	Yes	Yes
> 3 doses[d]	No+	No	No**	No

+Yes if more than 10 years since last dose

*Tdap may be substituted for Td if the person has not previously received Tdap and is 10 years or older

** Yes is more tan 5 years since last dose

Environmental Measures

Sterilization of hospital supplies will prevent the infrequent instances of tetanus that may occur in a hospital from contaminated sutures, instruments, or plaster casts.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Tetanus can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

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CDC. *Epidemiology & Prevention of Vaccine-Preventable Diseases: The Pink Book, 11th Edition*. CDC, January 2009.

Manual for the Surveillance of Vaccine-Preventable Diseases. 4th Edition CDC, 2008-2009. www.cdc.gov/vaccines/pubs/surv-manual/

CDC. Surveillance Summaries. Tetanus Surveillance-United States, 1995-1997. *MMWR*. July 3, 1998; 47:SS-2.

Heymann, David L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

FACT SHEET

TETANUS
(Lockjaw disease)

What is tetanus?
Tetanus is a disease caused by a toxin formed by the bacteria *Clostridium tetani*. It grows without oxygen at the site of an injury and has a short and relatively severe course that is often fatal.

What are the symptoms of a tetanus infection?
The illness is characterized by painful muscle contractions, especially stiffness and convulsive spasms of the jaw and neck muscles and the upper body or trunk muscles. A common first sign of tetanus in older children and adults is painful stiffness of stomach muscles.

How soon do symptoms appear?
Illness usually starts in 3 - 21 days, although it may occur as soon as 1 day depending on the type and location of the wound; the average is 10 days. A shorter time to illness is associated with a dirtier wound and more severe illness.

How does tetanus spread?
Tetanus spores are introduced into the body, usually through a puncture wound dirty with soil or animal or human feces. They may also be introduced through cuts, scraps, burns and trivial or unnoticed wounds, or by infected, contaminated street drugs. Tetanus may follow elective surgery, ear infections, or dental infection. Tetanus is not spread from person to person.

Who gets tetanus?
Anyone may get the illness, regardless of age. If a person has suffered a wound or injury and has not been adequately immunized against tetanus and received a booster shot every ten years, tetanus may occur. Most current cases occur in older adults who have not gotten a booster shot every 10 years to maintain protection.

For how long is a person infectious?
There is no infectious period because tetanus in not spread from person-to-person. Tetanus is the only vaccine-preventable disease that is not contagious.

What is the treatment for this illness?
Antibiotics play almost no role in the treatment of tetanus. Other drugs may be used by the healthcare provider.

Do infected people need to be excluded from school, work, or child care?
No, tetanus is not spread from person-to-person.

What can be done to help prevent the spread of tetanus?
Tetanus can be prevented by vaccination and keeping that protection up-to-date with a booster shot every 10 years.

Tetanus

Agency:

Investigator:

Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name:
First and middle name:
Maiden name: Suffix:
Address line:
Zip: City:
State: County:
Phone: ( )- - Type:
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS - NONE

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: Job title:
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:
Date worked from: / / Address:
Date worked to: / / Zip code:
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:
Date removed: / / Phone: ( )- - Type:
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: Job title:
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:
Date worked from: / / Address:

Date worked to: / / Zip code:

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Admission date: / / Discharge date: / / Days hospitalized:

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

Was this case in the intensive care unit for this disease?	☐ Yes ☐ No ☐ Unk	If yes, for how many days?	
Outcome one month after onset:	☐ Recovered ☐ Convalescing ☐ Died		
If case died from tetanus, list date of death:	/ /		

OTHER DEMOGRAPHIC INFORMATION

If case under 28 days old at onset, collect the following information

Mother's information

Mother's age (in years): / / . Mother's date of birth : / / . Mother's arrival in the U.S.: / / .

Mother's tetanus toxoid history

Did mother receive Tetanus toxoid before child onset: ☐ Yes ☐ No ☐ Unknown

How long before child onset: ☐ < 6 hours ☐ 7- 23 hours ☐ 1 - 4 days ☐ 5 - 9 days ☐ 10 - 14 days ☐ 15 + days

Years since last dose: _____.

Infant's information

Birthplace of infant: ☐ Hospital ☐ Home ☐ Other – see notes ☐ Unknown

Delivered by: ☐ Physician ☐ Nurse ☐ Licensed midwife ☐ Unlicensed midwife ☐ Other – see notes ☐ Unknown

CLINICAL INFO & DIAGNOSIS

Symptoms: ☐ Generalized spasms ☐ Painful muscle spasms

Type of tetanus disease: ☐ Cephalic ☐ Generalized ☐ Localized ☐ Unknown/Other _____

Pre-existing wound 21 days prior to onset: ☐ Yes ☐ No ☐ Unk

Wound location: ☐ Head ☐ Upper extremity ☐ Trunk ☐ Lower extremity

Wound type: ☐ Abrasion ☐ Avulsion ☐ Burn ☐ Compound fracture ☐ Crush ☐ Frostbite ☐ Linear laceration ☐ Puncture ☐ Stellate laceration

Wound depth: ☐ 1 cm or less ☐ More than 1 cm

Signs of infection: ☐ Yes ☐ No ☐ Unk

Contaminated: ☐ Yes ☐ No ☐ Unk

Devitalized, ischemic, or denervated tissue: ☐ Yes ☐ No ☐ Unk

Date wound occurred: / /

Setting: ☐ Automobile ☐ Farm/yard ☐ Home ☐ Petting zoo ☐ Work ☐ Other indoor/outdoor setting:

Other details:

Health care provider visited: ☐ Yes ☐ No ☐ Unk

Wound debridement performed: ☐ Yes ☐ No ☐ Unk

How soon after the injury: ☐ <6 hours ☐ 6-23 hours ☐ 1-4 days ☐ 5-9 days ☐ 10-14 days ☐ 15+ days

Performed by a healthcare provider: ☐ Yes ☐ No ☐ Unk

Other associated conditions: ☐ Abscess ☐ Ulcer ☐ Blister ☐ Gangrene ☐ Cellulitis ☐ Other ☐ None

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: / /	Date started: / /	Date started: / /
Dose:	Dose:	Dose:
☐ mg ☐ ml ☐ IU	☐ mg ☐ ml ☐ IU	☐ mg ☐ ml ☐ IU
Unit:	Unit:	Unit:
# of days:	# of days:	# of days:
# of times a day:	# of times a day:	# of times a day:
Route:	Route:	Route:

For the illness, were any of the following treatments required:

Ventilator: ☐ Yes ☐ No ☐ Unk Duration in days:

Tetanus immune globulin (TIG) received? ☐ Yes ☐ No ☐ Unknown

How soon after the injury: ☐ < 6 hours ☐ 7 – 23 hours ☐ 1 – 4 days ☐ 5 – 9 days ☐ 10 – 14 ☐ > 15 days days

How soon after onset: ☐ < 6 hours ☐ 7 – 23 hours ☐ 1 – 4 days ☐ 5 – 9 days ☐ 10 – 14 ☐ > 15 days days

Date started: _____ Number of days: _____

Dose: _____ Unit: _____ Number of times each day: _____

Route: _____

Tetanus toxoid received before onset? ☐ Yes ☐ No ☐ Unknown

Date started: _____ Number of days: _____

Dose: _____ Unit: _____ Number of times each day: _____

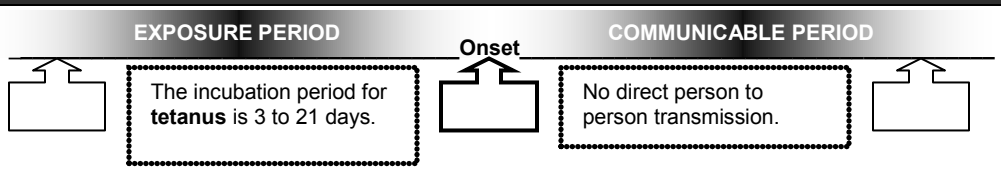
Route: _____

Therapeutic medication prescribed: ☐ Yes ☐ No ☐ Unk **List medications:** _____

Days in ICU: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Street drugs or steroids injected: ☐ Yes ☐ No ☐ Unknown

Ever served in the Military or National Guard? ☐ Yes ☐ No ☐ Unknown

If yes, what was your year of entry? ____

Vaccinated for tetanus: ☐ Yes ☐ No ☐ Unknown

Date vaccinated: / /	Date vaccinated: / /	Date vaccinated: / /
Lot #:	Lot #:	Lot #:
Vaccine type:	Vaccine type:	Vaccine type:
Manufacturer:	Manufacturer:	Manufacturer:

Number of vaccinations: ____

Does this case have diabetes: ☐ Yes ☐ No ☐ Unk Insulin dependent: ☐ Yes ☐ No ☐ Unk

NOTES: _____

TOXIC SHOCK SYNDROME

Also known as: TSS

Responsibilities:
Hospital: Report by IDSS, facsimile, mail, or phone.
Infection Preventionist: Report by IDSS, facsimile, mail, or phone. Assists with case investigation
Lab: Report by IDSS, facsimile, mail, or phone.
Physician: Report by facsimile, mail, or phone.
Local Public Health Agency(LPHA): Report by IDSS, facsimile, mail, or phone.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Toxic shock syndrome (TSS) is a serious complication of infection with strains of *Staphylococcus aureus* that produce TSS toxin-1 (TSST-1) or strains of *Streptococcus pyogenes* that produce pyrogenic exotoxin A. *S. pyogenes* is more commonly known as group A *streptococcus* (GAS).

B. Clinical Description

TSS is a severe toxin-mediated illness with sudden onset of high fever, vomiting, profuse watery diarrhea, and myalgia, followed by hypotension and potentially shock. During the acute phase of the illness, a "sunburn-like" rash is present. One to two weeks after onset, desquamation of the skin occurs, especially on the soles and palms. Typically, the fever is higher than 102°F, the systolic blood pressure is <90 mm Hg and three or more of the following organ systems are involved:

- gastrointestinal,
- muscular,
- mucous membranes (including vagina, pharynx, conjuctiva),
- renal,
- hepatic,
- respiratory,
- hematologic, or
- central nervous system.

Blood, cerebrospinal fluid and throat cultures are negative for pathogens other than *S. aureus* or GAS. Rocky Mountain spotted fever, leptospirosis and measles should be ruled out. TSS can be fatal.

C. Reservoirs

Humans are the primary reservoir for both *S. aureus* and GAS.

D. Modes of Transmission

While TSS itself is not communicable from person-to-person, the organisms that cause TSS are. *S. aureus* is transmitted from person-to-person through direct contact with lesions or contaminated respiratory secretions. Airborne transmission is rare but has been documented in small children with respiratory disease.

GAS is transmitted from person-to-person through large respiratory droplets or direct contact with infected lesions. GAS can also be transmitted through ingestion of contaminated food, most commonly eggs, milk and milk products, resulting in outbreaks of GAS pharyngitis.

With both *S. aureus* and GAS, indirect contact through objects is rarely associated with illness, but it has occurred in schools through contaminated wrestling mats and in child care centers through play food and other shared toys.

D. Incubation period

The incubation period for *S. aureus* infection is variable, with a 4 - 10 day average. For GAS infection it approximately 1 to 3 days. The median incubation period for post-surgical TSS is 2 days.

E. Period of Communicability or Infectious Period

TSS itself is not communicable from person-to-person. With *S. aureus,* the infectious period lasts as long as lesions drain or the carrier state exists. In untreated, uncomplicated GAS cases, the infectious period may be 10 - 21 days; if purulent discharge is present, the infectious period may be extended to weeks or months. Persons with untreated GAS pharyngitis may carry and transmit the bacteria for weeks or months, with decreasing contagiousness 2 - 3 weeks after illness onset.

F. Epidemiology

In 1980, TSS became widely recognized when an association between TSS and the use of tampons was established. Since that time, the proportion of TSS cases associated with menstruation has decreased. Cases of TSS have been associated with childbirth, abortions, vaginal infections, surgical wound infections, focal lesions of the bone or respiratory tract, and cutaneous or subcutaneous lesions. The source of infection is unknown in up to one-third of cases. Cases are seen in both males and females.

Persons considered at risk for TSS include: 1) menstruating women using tampons or other inserted vaginal devices (such diaphragms or contraceptive sponges), and 2) persons with focal *S. aureus* or GAS infections.

G. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify household and other close contacts for possible culture and treatment of the underlying bacterial cause.
- To identify transmission sources of public health concern (*e.g.,* contaminated food or a healthcare worker who is a GAS carrier) and to stop transmission from such sources.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing IDSS. However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515), 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Laboratory Testing Services Available

The State Hygienic Laboratory (SHL) does not provide services for the testing to confirm TSS. However, SHL will test specimens for the presence of *S. aureus* or Beta Strep Group A. In some outbreak circumstances, isolates may be sent to Centers for Disease Control and Prevention (CDC) for toxin testing. For more information contact SHL at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Hospital Infection Preventionist will have the information necessary to initiate case follow-up.

The hospital Infection Preventionist usually completes the investigation, utilizing the Iowa Disease Surveillance System (IDSS).

a. Use the following guidelines to complete the investigation:
   1) Record the demographic information, date of symptom onset, and hospitalized dates. If the case is a menstruating woman, collect information on tampon and sanitary napkin/minipad use, including the brand and style of product, as well as date of onset of last menstrual period.
   2) Clinical findings, laboratory data and culture information are all important in defining a case. Collect the data for these sections of the case investigation as completely as possible.
   3) If several attempts have been made to obtain case information, but have been unsuccessful, fill out the form with as much information as possible. Enter into the Notes section the reason why it could not be filled out completely. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.
   4) After completing the investigation, enter the information into IDSS or fax to (515) 281-5698 or mail (in an envelope marked "Confidential") to IDPH/CADE, mailing address:
      Iowa Department of Public Health
      Center for Acute Disease Epidemiology
      Lucas State Office Building
      321 East 12th St.
      Des Moines, IA 50319-0075
   5) Local public health shall assist with case follow-up as necessary and review the investigation and assure it is complete.

d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if required by IDPH, to institute the control guidelines listed below.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

If it has been determined that the case was caused by GAS, household contacts of the case should have throat cultures taken, and if positive for GAS, be treated with antibiotics. Other close contacts should be evaluated and cultured if symptomatic.

C. Managing Special Situations

Child Care

If the TSS is caused by GAS, consider throat cultures for all symptomatic child care attendees and staff who are contacts of the case, with subsequent antibiotic treatment of those found to be GAS culture positive. Contact the Center for Acute Disease Epidemiology (CADE) for assistance in managing follow-up of a case in child care.

School

If the TSS is caused by GAS, consider throat cultures for all symptomatic classroom members and other close contacts of the case, with subsequent antibiotic treatment of those found to be GAS culture-positive. Contact the Center for Acute Disease Epidemiology (CADE) for assistance in managing follow-up of a case in a school.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If you suspect an outbreak, investigate to determine the source of infection and mode of transmission. Seek a common exposure, such as association with a child care center, and institute applicable preventive or control measures. Control of person-to-person transmission requires special emphasis on personal cleanliness and handwashing. Consult CADE for assistance.

H. Preventive Measures

Environmental Measures

Advise child care centers to clean toys daily using an approved disinfectant and to discourage the use of play food, which facilitates the transmission of not only this bacterium but many others as well. Also advise schools to frequently sanitize shared sports equipment, such as wrestling and gymnastics mats.

I. Personal Preventive Measures/Education

To avoid exposure, advise individuals to:

- Use the lowest absorbency tampon and change frequently. Discontinue tampon use *immediately* and call their healthcare provider if they develop a high fever and vomiting or diarrhea during menstruation.
- Follow directions for use of diaphragms or contraceptive sponges and do not leave the device in place for more than 30 hours.
- Complete the full course of treatment if prescribed antibiotics for *staphylococcus* or *streptococcus* infections.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Toxic Shock Syndrome can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *1997 Red Book: Report of the Committee on Infectious Diseases, 24th Edition*. Illinois, American Academy of Pediatrics, 1997.
CSTE Position Statement Number: 10-ID-14
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

FACT SHEET TOXIC SHOCK SYNDROME (TSS)

What is toxic shock syndrome?
Toxic shock syndrome (TSS) is a serious complication of infection with strains of *Staphylococcus aureus* that produce TSS toxin-1 (TSST-1) or strains of *Streptococcus pyogenes* that produce pyrogenic exotoxin A. *S. pyogenes* is more commonly known as group A *streptococcus* (GAS).

Who is at risk for toxic shock syndrome?
Any one is at risk, however, menstruating women, women who use barrier contraceptive devices, persons who have undergone nasal surgery, and persons with postoperative staphylococcal wound infections are at highest risk.

How do you get toxic shock syndrome?
TSS has been associated with use of tampons and intravaginal contraceptive devices in women and occurs as a complication of skin abscesses or surgery in either sex.

Can toxic shock syndrome be spread from person-to-person?
TSS itself is not communicable from person-to-person.

What are the symptoms of toxic shock syndrome?
Toxic shock syndrome (TSS) is characterized by sudden onset of fever, chills, vomiting, diarrhea, muscle aches and rash. It can rapidly progress to severe and intractable hypotension and multisystem dysfunction.

How soon will symptoms appear?
The incubation period for TSS ranges from 1 - 10 days, on average.

How can toxic shock syndrome be prevented?
To avoid exposure, advise individuals to:

- Use the lowest absorbency tampon and change frequently. Discontinue tampon use *immediately* and call their healthcare provider if they develop a high fever and vomiting or diarrhea during menstruation.
- Follow directions for use of diaphragms or contraceptive sponges and do not leave the device in place for more than 30 hours.
- Complete the full course of treatment if prescribed antibiotics for *staphylococcus* or *streptococcus* infections.

Toxic Shock Syndrome

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of Death / /
Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider title: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Type (e.g. serotype):

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Type (e.g. serotype):

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Test type: _____

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: Type (e.g. serotype):

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown

Date worked from: / /

Date worked to: / /

Removed from duties: ☐ Yes ☐ No ☐ Unknown

Date removed:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Facility name:

Address:

Zip code:

City: State: County:

Phone: ( ) Type:

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown

Date worked from: / /

Date worked to: / /

Removed from duties: ☐ Yes ☐ No ☐ Unknown

Date removed: / /

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Facility name:

Address:

Zip code:

City: State: County:

Phone: ( ) Type:

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Fever: ☐ Yes ☐ No ☐ Unk Onset date: / / Highest known fever: C/F

Rash: ☐ Yes ☐ No ☐ Unk Rash characteristics:

☐ Burning ☐ Confluent lesions ☐ Could be felt (papule) ☐ Could not be felt (macule)

☐ Discrete lesions ☐ Distinct sharp borders ☐ Marked itching ☐ Dusky brown ☐ Numbness

☐ Painful ☐ Peeling skin ☐ Pustule ☐ Reddish ☐ Scaling/crusting

Soft tissue necrosis: ☐ Yes ☐ No ☐ Unk

Necrotizing fascitis present: ☐ Yes ☐ No ☐ Unk **DIC:** ☐ Yes ☐ No ☐ Unk **Lowest systolic blood pressure:** _____

Other symptoms present:

☐ Abdominal pain ☐ Confusion ☐ Conjuntival hyperemia ☐ Diarrhea

☐ Injected tongue ☐ Muscle pain ☐ Oropharyngeal hyperemia

☐ Seizures ☐ Sore throat ☐ Vaginal discharge

☐ Vaginal hyperemia ☐ Vaginal ulceration ☐ Vomiting

OTHER LAB FINDINGS

CBC performed: ☐ Yes ☐No ☐ Unk

WBC count (in mm3): _____

Neutrophils (in %): _____

Metamyelocytes (in %): _____

Myelocytes (in %): _____

Bands (in %): _____

Platelet count (in mm3): _____

Highest platelet value (in mm3): _____

Bilirubin (in mg/dl): _____

Creatine (in mg/dl): _____

Creatine phosphokinase (in IU/l): _____

Hypoalbuminemia: ☐ Yes ☐No ☐ Unk

Pyuria: ☐ Yes ☐No ☐ Unk

ALT performed: ☐ Yes ☐No ☐ Unk

Result (in IU/l): _____

Expected minimum (in IU/l): _____

Expected maximum (in IU/l): _____

AST performed: ☐ Yes ☐No ☐ Unk

Result (in IU/l): _____

Expected minimum (in IU/l): _____

Expected maximum (in IU/l): _____

Urinalysis performed: ☐ Yes ☐No ☐ Unk

WBC/HPF(in cells/mcl): _____

RBC/HPF (in cells/mcl): _____

Protein: ☐ 1 ☐ 2 ☐ 3 ☐ 4

Chest x-ray done: ☐ Yes ☐No ☐ Unk Date: ___/___/___ Result: _____

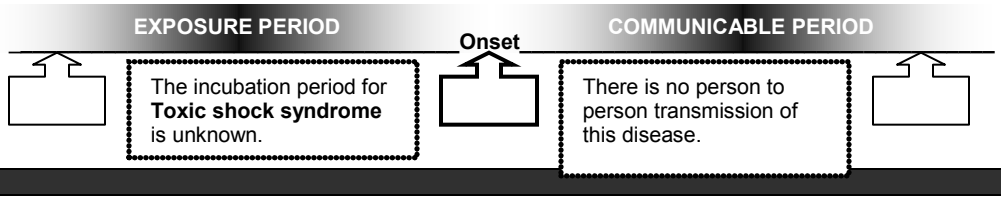
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:	Antibiotic:	Antibiotic:
Date started: ___/___/___	Date started: ___/___/___	Date started: ___/___/___
Dose:	Dose:	Dose:
Unit: ☐ mg ☐ ml ☐ IU # of days:	Unit: ☐ mg ☐ ml ☐ IU # of days:	Unit: ☐ mg ☐ ml ☐ IU # of days:
# of times a day: Route:	# of times a day: Route:	# of times a day: Route:

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Similar illness in past: ☐ Yes ☐No ☐ Unk # of episodes: ☐ 1 ☐ 2 ☐ 3 ☐ >3

Tampon used: ☐ Yes ☐No ☐ Unk

Brand name: ☐ Assure ☐ Store brand ☐ Kotex ☐ Tampax ☐ OB ☐ Playtex ☐ Pursettes ☐ Rely ☐Other _____

Insertion type: ☐ Plastic inserter ☐ Stick inserter

Odor protection type: ☐ Deodorized ☐ Non-deodorized

Absorbency: ☐ Lite ☐ Regular ☐ Super ☐ Super plus

Napkin used: ☐ Yes ☐No ☐ Unk

Brand name: _____

Odor protection type: ☐ Deodorized ☐ Non-deodorized

Absorbency: ☐ Lite ☐ Regular ☐ Super ☐ Super plus

Sponge or diaphragm used: ☐ Yes ☐No ☐ Unk

Postpartum/ post abortion: ☐ Yes ☐No ☐ Unk

Mini-pad used: ☐ Yes ☐No ☐ Unk

Brand name: _____

Odor protection type: ☐ Deodorized ☐ Non-deodorized

Absorbency: ☐ Lite ☐ Regular ☐ Super ☐ Super plus

Surgical procedures: ☐ Yes ☐No ☐ Unk

Skin lesions (scratch or cut): ☐ Yes ☐No ☐ Unk

NOTES:

TRICHINOSIS

Also known as: Trichinellosis

Responsibilities:
Hospital: Report by IDSS, facsimile, mail, or phone
Infection preventionist: Report by IDSS, facsimile, mail, or phone
Lab: Report by IDSS, facsimile, mail, or phone
Physician: Report by facsimile, mail, or phone
Local Public Health Agency (LPHA): Report by IDSS, mail, facsimile, or phone. Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Trichinosis is caused by *Trichinella spiralis,* a parasitic intestinal roundworm. Multiple species of *Trichinella* are capable of causing infection in mammals, but *T. spiralis* is the most common cause of human infection.

B. Clinical Description

Trichinosis in humans can range from asymptomatic to fatal, depending on the infective dose. In the week following ingestion of infected meat, a patient may experience nausea, vomiting, diarrhea and abdominal discomfort, as the released larvae mature and attach to the intestinal mucosa. A sudden onset of muscle soreness and pain, fever, edema of the upper eyelid and urticarial rash, 2 - 8 weeks after ingestion, is characteristic of earlier infection, as larvae migrate into muscle tissue. Eye pain, photophobia, thirst, profuse sweating, chills, weakness and a rapid increase in eosinophil counts on blood exam may also occur. Recurring fever up to 104°F usually stops after 1 - 6 weeks. In the most severe infections, cardiac and neurologic complications, sometimes leading to death, may occur in the 3rd - 6th week.

C. Reservoirs

Swine, dogs, cats, horses, rodents and many wild animals, such as bear, wolf, wild boar, fox and Arctic marine mammals, can serve as reservoirs for *Trichinella*.

D. Modes of Transmission

Transmission occurs by ingestion of raw or undercooked meats containing *Trichinella* cysts. Pork and pork products are the most likely source. Beef products, which may become inadvertently adulterated with raw pork during processing, may also be a source. As many as 30% of domestic cases of trichinosis are thought to correlate with ingestion of meat from wild game animals. There is no person-to-person spread of trichinosis.

E. Incubation period

Gastrointestinal symptoms may appear within a few days after infection; appearance of systemic symptoms ranges from 5 - 45 days. The usual incubation period is 8 - 15 days. If large numbers of cysts are ingested, symptoms may occur more rapidly.

F. Period of Communicability or Infectious Period

Trichinosis is not transmitted directly from person-to-person. Animal hosts may remain infective for months, and meat from these animals remains infective until the larvae are killed by sufficient cooking, freezing or irradiation.

G. Epidemiology

Trichinosis occurs worldwide, and affects people of all ages. The incidence of disease is dependent on local customs regarding eating pork or undercooked meats. Over the past 40 years, few cases of trichinellosis have been reported in the United States, and the risk of trichinellosis from commercially raised and properly prepared pork is very low. However, eating undercooked wild game, particularly bear meat, puts one at risk for acquiring this disease.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify sources of public health concern (*e.g.,* undercooked *Trichinella*-infected pork sold at a restaurant) and stop transmission at the source.
- To identify and control outbreaks.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory tests single serum samples utilizing Enzyme Immunoassay. For more information about submitting specimens, contact the State Hygienic Laboratory at (319) 335-4500.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation: Complete the investigation using IDSS. The investigation will likely focus on suspect meat that has been ingested.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle, such as food should be sought, and applicable preventive or control measures instituted (*e.g.,* removing an implicated food item from the environment). Consult with the epidemiologist on-call at the Center for Acute Disease Epidemiology (CADE) at (800) 362-2736. The Center can help determine a course of action to prevent further cases, and perform surveillance for cases that cross county lines.

D. Preventive Measures

To avoid future exposure, individuals should be made aware of the following:

- Thoroughly cook pork, pork products and wild game until the meat is no longer pink Allow sufficient cooking time so that all parts of the meat reach an internal temperature of at least 170°F. Freezing pork less than 6 inches thick for 20 days at 5°F will kill the larvae, but freezing wild game meats may leave some larvae alive, so this meat must always be thoroughly cooked.
- Grind pork in a separate grinder from other foods, and thoroughly disinfect the grinder between products.
- Thoroughly cook all meats from wild animals. Meat products should be processed by heating, freezing or irradiation prior to drying or smoking for jerky.
- Cook any meat fed to pigs or other animals being raised for human consumption. Hogs should not be allowed to eat uncooked carcasses of other animals, including rats, which may be infected with trichinosis.
- Be aware that curing (salting), drying, smoking, or microwaving meat does not consistently kill infective larvae.

Individuals known to have recently ingested the same product as the case being investigated should consult with a healthcare provider regarding treatment options.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Trichinosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Comment:

In an outbreak setting, at least one case must be laboratory confirmed. Associated cases should be reported as confirmed if the patient shared an epidemiologically implicated meal or ate an epidemiologically implicated meat product and has either a positive serologic test for trichinosis or a clinically compatible illness.

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.
CDC. Trichinosis website: www.cdc.gov/parasites/trichinellosis/health_professionals/index.html
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.
McAuley, J.B., Michelson, M.K., Schantz, P.M., Trichinosis Surveillance, United States, 1987–1990. *MMWR*. 1990; 40(SS-3): 35-42.

FACT SHEET TRICHINOSIS

What is trichinosis?
Trichinellosis, also called trichinosis (TRICK-a-NO-sis), is caused by eating raw or undercooked pork and wild game products infected with the larvae of a species of worm called *Trichinella*. Infection occurs worldwide, but is most common in areas where raw or undercooked pork, such as ham or sausage, is eaten.

What are the symptoms of trichinosis?
Nausea, diarrhea, vomiting, fatigue, fever, and abdominal discomfort are the first symptoms of trichinellosis. Headaches, fevers, chills, cough, eye swelling, aching joints and muscle pains, itchy skin, diarrhea, or constipation follow the first symptoms. If the infection is heavy, patients may experience difficulty coordinating movements, and have heart and breathing problems. In severe cases, death can occur. In mild to moderate infections, most symptoms subside within a few months. Fatigue, weakness, and intermittent muscle aches may last for months.

How soon do symptoms appear?
Abdominal symptoms can occur 1 – 2 days after infection. Later symptoms usually start 2 - 8 weeks after eating contaminated meat. Symptoms may range from very mild to severe, and relate to the number of infectious worms consumed. Often, mild cases of trichinellosis are not specifically diagnosed, and are assumed to be the flu or other common illnesses.

How is trichinosis spread?
When a human or animal eats meat that contains infective *Trichinella* cysts, the acid in the stomach dissolves the hard covering of the cyst and releases the worms. The worms pass into the small intestine and, in 1-2 days, become mature. After mating, adult females lay eggs. Eggs develop into immature worms, which penetrate the wall of the intestine, travel through the arteries, and are transported to muscles. Within the muscles, the worms curl into balls, and encyst (become enclosed in a capsule). Infection occurs when these encysted worms are consumed in meat.

Who gets trichinosis?
If you eat raw or undercooked meats, particularly pork, bear, wild feline (such as a cougar), fox, dog, wolf, horse, seal, or walrus, you are at risk for trichinellosis.

How long is a person infectious?
Infection can only occur by eating raw or undercooked meat containing *Trichinella* worms. It is not spread from person to person.

What is the treatment for this illness?
Several safe and effective prescription drugs are available. Treatment should begin as soon as possible, and the decision to treat is based upon symptoms, exposure to raw or undercooked meat, and laboratory test results.

Do infected people need to be excluded from school, work, or child care?
No. Infection can only occur by eating raw or undercooked meat containing the worms.

What can be done to help prevent the spread of these worms?
- Cook meat products until the juices run clear, or to an internal temperature of 170 ^{o} F.
- Freeze pork less than 6 inches thick for 20 days at 5 ^{o} F to kill any worms.
- Cook wild game meat thoroughly. Freezing wild game meats, even for long periods of time, may not effectively kill all worms.
- Cook all meat fed to pigs or other wild animals.
- Do not allow hogs to eat uncooked carcasses of other animals, including rats, which may be infected.
- Clean meat grinders thoroughly after preparing ground meats.
- Curing (salting), drying, smoking, or microwaving meat does not consistently kill the worms.

Trichinellosis

Agency: ____

Investigator: ____ Phone number: ____

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ____
First and middle name: ____
Maiden name: ____ Suffix: ____
Address line: ____
Zip: ____ City: ____
State: ____ County: ____
Phone: ( )- - Type: ____
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ____

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ____
Parent/Guardian phone: ( )- - Type: ____

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ____
Exposure setting: ____
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ____ Country: ____

Healthcare provider information

Last name: ____
First name: ____
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ____
Address line 1: ____
Address line 2: ____
Zip code: ____ City: ____
State: ____ County: ____
Phone : ( )- - Type: ____

LABORATORY FINDINGS

Laboratory: ____ Accession #: ____ Collection date: / /
Date received: / / Specimen source: ____ Test type: ____
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Trichinella*** Type (e.g. serotype):

Laboratory: ____ Accession #: ____ Collection date: / /
Date received: / / Specimen source: ____ Test type: ____
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Trichinella*** Type (e.g. serotype):

Laboratory: ____ Accession #: ____ Collection date: / /
Date received: / / Specimen source: ____ Test type: ____
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Trichinella*** Type (e.g. serotype):

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Fever: ☐ Yes ☐ No ☐ Unk Onset date: / / Highest known fever: C/F

Eosinophilla: ☐ Yes ☐ No ☐ Unk Absolute #: _____ Percent: _____

Periorbital edema: ☐ Yes ☐ No ☐ Unk **Myalgia:** ☐ Yes ☐ No ☐ Unk

OTHER LAB FINDINGS

Biopsy performed: ☐ Yes ☐ No ☐ Unk Date: / / Site: _____ Result: _____

TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

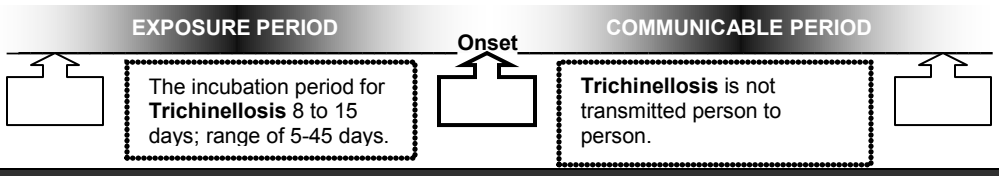
Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____
# of times a day: _____
Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____
# of times a day: _____
Route: _____

Antibiotic: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____
# of times a day: _____
Route: _____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Dietary Information – *In the 45 days prior to onset of symptoms did the case consume the following:*

Meat and poultry

Pork: ☐ Yes ☐ No ☐ Unk

Pork type: ☐ Bacon ☐ Ham ☐ Sausage ☐ Chops ☐ Roast ☐ Wild Boar ☐ Other

List all brand names: _____

Obtained where: ☐ Butcher shop ☐ Hunted/Trapped ☐ Supermarket/Grocery store ☐ Direct from farm ☐ Restaurant /Eating establishment ☐ Unknown

Preparation: ☐ Dried jerky ☐ Marinated ☐ Smoked ☐ Ground ☐ No further processing ☐ Other

Cooking method: ☐ Broiled ☐ Fried ☐ Open-fire roasting ☐ Smoked ☐ Dehydrated ☐ Grilled ☐ Roasted ☐ Uncooked ☐ Unknown

From dates consumed: __/__/__ , __/__/__ To dates consumed: __/__/__ , __/__/__

Meat other than pork: ☐ Yes ☐ No ☐ Unk

Meat type: ☐ Bear ☐ Hamburger ☐ Bison ☐ Venison ☐ Other

List all brand names:

Obtained where: ☐ Butcher shop ☐ Hunted/Trapped ☐ Supermarket/Grocery store ☐ Direct from farm ☐ Restaurant /Eating establishment ☐ Unknown

Preparation: ☐ Dried jerky ☐ Marinated ☐ Smoked ☐ Ground ☐ No further processing ☐ Other

Cooking method: ☐ Broiled ☐ Fried ☐ Open-fire roasting ☐ Smoked ☐ Dehydrated ☐ Grilled ☐ Roasted ☐ Uncooked ☐ Unknown

From dates consumed: __/__/__ , __/__/__ To dates consumed: __/__/__ , __/__/__

NOTES: _____

TUBERCULOSIS

Also known as: TB, Consumption

Responsibilities:
Hospital: Report by facsimile, mail or phone
Infection Preventionist: Notify Iowa TB Control Program
Lab: Report presumptive/positive cultures of TB
Physician: Report all suspected or active cases by mail or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health TB Control Program: (515) 281-8636 or (515) 281-7504
Secure Fax: (515) 281-4570

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

TB is a communicable disease caused by *Mycobacterium tuberculosis*, sometimes referred to as the tubercle bacillus. It is spread primarily by tiny airborne particles (droplet nuclei) expelled from a person who has infectious TB. If another person inhales air containing these droplet nuclei, transmission may occur. Some bacilli reach the alveoli, where they are ingested by macrophages. Infection begins with the multiplication of tubercle bacilli within these alveolar macrophages. Some of the bacilli spread through the bloodstream when the macrophages die; however, the immune system response usually contains the bacilli and prevents the development of disease. Persons who are infected but who do not have TB disease are asymptomatic and not infectious; such persons usually have a positive reaction to the tuberculin skin test (PPD). Only 10% of infected persons will develop TB disease at some time in their lives, but the risk is considerably higher for persons who are immunosuppressed, especially those with HIV infection. Although the majority of TB disease in adults is pulmonary, TB can occur in almost any anatomical site or as disseminated disease.

B. Clinical Description

Symptoms: The general symptoms of TB disease include feeling sick or weak, weight loss, fever, and night sweats. The symptoms of pulmonary TB include coughing, chest pain, and coughing up blood. Other symptoms depend on the part of the body that is affected.

Onset: Persons at the highest risk of becoming infected with tuberculosis are close contacts — persons who have had prolonged, frequent, or intense contact with a person with infectious TB. Close contacts may be family members, roommates, friends, co-workers, or others. Data collected by CDC since 1987 show that infection rates have been relatively stable, ranging from 30% for the contacts of infectious TB patients.

Complications: Person's with TB can develop life-threatening complications. Worldwide, approximately two million people die each year from TB. If treated properly and early enough, people with TB can be cured.

Infants/children -- LTBI: Because of their age, infants and young children with LTBI are known to have been infected recently, and thus are at a high risk of their infection progressing to disease. Infants and young children are also more likely than older children and adults to develop life-threatening forms of TB. Children <5 years of age who are close contacts should receive treatment for LTBI even if the tuberculin skin test result and chest radiograph do not suggest TB, because infected infants may be anergic as late as 6 months of age. A second tuberculin test

should be done 8 – 10 weeks after the last exposure to infectious TB. Treatment of LTBI can be discontinued if **all** of the following conditions are met:

- The infant is at least 6 months of age;
- The second tuberculin skin test is negative;
- The second test was performed at least 8 weeks after the child was last exposed to infectious TB.

Infants/children –TB disease: Because of the high risk of disseminated tuberculosis in infants and children younger than 5 years of age, treatment should be started as soon as the diagnosis of tuberculosis is suspected.

C. Reservoirs

Common reservoirs: Humans

Less Common reservoirs: Livestock, wildlife, mainly for *m. bovis*.

D. Modes of Transmission

Spread: TB germs are placed in the air when a person with pulmonary TB disease of the lungs or throat coughs, sneezes, speaks or sings. When a person inhales air that contains TB germs, he or she may become infected. Pulmonary Tuberculosis (TB) is spread from person to person through the air. It usually affects the lungs, but it can also affect other parts of the body, such as the brain, kidneys, or spine. People with TB infection (and not disease) do not feel sick and do not have any symptoms. However, they may develop TB disease at some time in the future.

People with TB disease are most likely to spread it to people they spend time with every day, such as family members or co-workers. If someone thinks they have been around someone who has TB disease, they should go to their medical provider or the local health department for tests. It is important to remember that people who have TB infection but not TB disease cannot spread the germs to others.

E. Incubation period

For people with latent TB infection (LTBI) and no risk factors, the risk of LTBI developing into disease is about 10% over a lifetime. For people with TB infection and diabetes, the risk is 3 times higher, or about 30% over a lifetime. For people with TB infection and HIV infection, the risk is about 7% to 10% PER YEAR, a very high risk over a lifetime.

F. Period of Communicability or Infectious Period

In general, patients who have suspected or confirmed active TB should be considered infectious if (a) they are coughing, undergoing cough-inducing procedures, or their sputum smears are positive for acid-fast bacilli; **and** (b) they are not receiving therapy, have just started therapy, or have a poor clinical or bacteriologic response to therapy. The infectious period is closed when the following criteria are satisfied: 1) effective treatment (as demonstrated by *M. tuberculosis* susceptibility results) for ≥2 weeks; 2) diminished symptoms; and 3) mycobacteriologic response (e.g., decrease in grade of sputum smear positivity detected on sputum-smear microscopy). The exposure period for individual contacts is determined by how much time they spent with the index patient during the infectious period. Multidrug-resistant TB (MDR TB) can extend infectiousness if the treatment regimen is ineffective. Any index patient with signs of extended infectiousness should be continually reassessed for recent contacts.

More stringent criteria should be applied for setting the end of the infectious period if particularly susceptible contacts are involved. A patient returning to a congregate living setting or to any setting in which susceptible persons might be exposed should have at least three consecutive negative sputum AFB smear results from sputum collected ≥8 hours apart (with one specimen collected during the early morning) before being considered noninfectious.

G. Epidemiology

One third of the world's population is infected with the TB bacteria and each year over 9 million people around the world become ill from it. An estimated 10 - 15 million persons in this country are infected with *M. tuberculosis*. TB disease may develop in these persons at some time in the future. For current TB data, please refer to the IDPH TB Control webpage: www.idph.state.ia.us/ImmTB/TB.aspx?prog=Tb&pg=TbHome

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting:

Prevention and control efforts should include three priority strategies:

- Identifying and treating all persons who have TB disease
- Finding and evaluating persons who have been in contact with TB patients to determine whether they have TB infection or disease, and treating them appropriately
- Testing high-risk groups for TB infection to identify candidates for treatment of latent infection and to ensure the completion of treatment.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report suspected/confirmed *M. tuberculosis*.

What to report:

- Pulmonary and extrapulmonary sites of disease should be reported to IDPH within one working day. This includes laboratory confirmed or clinically suspected tuberculosis disease.
- Latent tuberculosis infection (LTBI) is not reportable.
- IDPH provides medication free of charge for anyone to treat both LTBI and TB disease.

How to report tuberculosis:

Call or FAX: IDPH TB Control Program
(515) 281-8636 or (515) 281-7504
Fax (515) 281-4570.

IDPH TB Control Program requests that tuberculosis cases be reported by phone to help ensure timely public health follow-up measures.

Specimens should be submitted to:

State Hygienic Laboratory
UI Research Park - Coralville
Iowa City, IA 52242-5002
319-335-4500 or 800-421-IOWA

Postage-paid disease reporting forms are available free of charge from the Iowa TB Control Program at (515) 281-8636 or (515) 281-7504.

Both outpatient and inpatient facilities that offer services for TB patients should have ready access to laboratory and diagnostic services. Access to radiological services includes radiography equipment, trained radiography technicians, and radiograph interpretation by a qualified person. Radiograph findings and reports should be available within 24 hours.

Laboratory services should be readily accessible to provide results of acid-fast bacilli smear examinations within 24 hours of specimen collection. The State Hygienic Lab is designated to process all isolates for TB in the state. Smear results are available within 24 hours from receipt of the specimen. All initial positive smears are telephoned to the submitting facility.

AMPLIFIED MYCOBACTERIUM TUBERCULOSIS Direct (MTD) Test
Description: Direct target-amplified nucleic acid probe test for the in vitro diagnostic detection of Mycobacterium tuberculosis complex rRNA in acid-fast bacilli (AFB) smear positive and negative concentrated sediments from sputum, bronchial specimens, or tracheal aspirates. For testing information, call the State Hygienic Laboratory at 319-335-4500 or the IDPH TB Control Program at 515-281-8636/515-281-7504.

The use of the BACTEC liquid culture system and DNA probes for M. tuberculosis continue to aid in rapidly and accurately isolating and identifying cultures of mycobacteria. All isolates are tested for drug susceptibilities. All M. tuberculosis identifications and susceptibility results are telephoned to the submitter immediately. The TB Control Program also receives these reports.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

Contact Investigation

Prompt and thorough contact investigation is essential for the control of TB. The purpose of the investigation is to find contacts who (1) have TB disease so that they can be given treatment, and further transmission can be stopped, (2) have latent TB infection (LTBI) so they can be given treatment, and (3) are at high risk of developing TB disease and therefore require treatment until LTBI can be excluded.

The local health departments are legally responsible for ensuring that a complete and timely contact investigation is done for the TB cases reported in its area. Therefore, health departments should work closely with other agencies (e.g., managed care organizations, private providers) to ensure the prompt reporting of suspected TB cases. The health department should work closely with other agencies to plan the contact investigation and receive a report of the results. Occasionally, a contact investigation may be conducted by people outside of the health department, but under the supervision of the health department.

Contact investigations should be discussed with the TB Control Program Manager. The results of all contact investigations must be submitted to the Iowa TB Control Program. Forms used to document investigations are available by calling the program at (515) 281-7504 or (515) 281-8636.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Suspected or active cases of infectious TB should be isolated to home and not return to normal activities until they meet the criteria for non-infectiousness (see Period of Communicability or Infectious Period). Persons already living in the household may continue to do so. These persons are free to continue their normal activities. People not previously exposed should refrain from entering the environment until the patient is no longer infectious.

Although TB care and treatment are often provided by other medical care providers, the health department has the ultimate responsibility for ensuring that TB patients do not transmit *M. tuberculosis* to others. Health departments must ensure that medical services are available, accessible, and acceptable for TB patients, suspects, contacts, and others at high risk, without regard to the patients' ability to pay for such services.

B. Protection of Contacts of a Case

The local health department will identify and evaluate all close contacts of suspected or active cases of TB. These contacts will be evaluated to determine if they have latent tuberculosis infection or active disease.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Report unusual cases to the Iowa TB Control Program at (515) 281-7504.

Exposure of a Laboratory Worker

Confer with Iowa TB Control Program or Infection Preventionist at the place of exposure.

D. Preventive Measures

Environmental Measures

The second level of the hierarchy is the use of engineering controls to prevent the spread and reduce the concentration of infectious droplet nuclei. These controls include (a) direct source control using exhaust ventilation, (b) controlling the direction of airflow to prevent the contamination of air in areas adjacent to the infectious source, (c) diluting and removing contaminated air via general ventilation, and (d) cleaning the air via air filtration or ultraviolet germicidal irradiation

Preventive Measures/Education

Call the Iowa TB Control Program at (515) 281-8636 or (515) 281-7504.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Tuberculosis can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

In the United States, the vast majority of TB cases are caused by Mycobacterium tuberculosis, sometimes referred to as the tubercle bacillus. M. tuberculosis and six very closely related mycobacterial species (*M. bovis, M. africanum*, and *M. microti*, *M. canetii, M. caprae, M. pinnipeddi*) can cause tuberculosis disease, and they compose what is known as the M. tuberculosis complex. Mycobacteria other than those comprising the *M. tuberculosis* complex are called nontuberculous mycobacteria. Nontuberculous mycobacteria may cause pulmonary disease resembling TB.

References

Centers For Disease Control and Prevention – Division of Tuberculosis Elimination www.cdc.gov/tb/
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Additional Resources

Treatment of Tuberculosis: MMWR June 20, 2003 / 52(RR11); 1-77
www.cdc.gov/mmwr/preview/mmwrhtml/rr5211a1.htm
IDPH TB website: www.idph.state.ia.us/ImmTB/TB.aspx?prog=Tb&pg=TbHome

FACT SHEET

TUBERCULOSIS
(TB, Consumption)

What is tuberculosis?
Tuberculosis (TB) is a disease that is spread from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine.

Who is at risk for tuberculosis?
The main risk groups are HIV positive persons, close contacts of active cases of TB and recent immigrants (within last 5 years) from countries where TB is much more common.

How does someone get tuberculosis?
Anyone can get TB – the risk groups previously defined are most likely to acquire TB.

Can tuberculosis be spread from person-to-person?
Yes, TB is a disease that is spread from person to person through the air. Usually, prolonged close contact with someone with infectious TB must occur before someone becomes infected.

What are the symptoms of tuberculosis?
People with a positive skin test for TB but no signs of illness (latent TB infection) have the germ that causes TB in their bodies. They are not sick because the germs are inactive in their bodies. They cannot spread the germs to others. However, these people may develop TB disease in the future. They are often prescribed medication to prevent them from developing the disease.

People with TB disease have germs that are active in their body. They usually have symptoms of TB, such as, coughing, weight loss, fever, or night sweats. Usually, people with TB disease of the lungs or throat are capable of spreading the disease to others. They are prescribed drugs that can cure TB.

How long will symptoms last?
For active disease, symptoms will usually persist unless treated properly with anti- TB medications.

How is tuberculosis diagnosed?
A test on material coughed up from the lungs is done to confirm diagnosis. Even if the test is negative for TB, a healthcare provider may diagnosis TB based on symptoms.

How is tuberculosis treated?
The first-line anti-TB agents that form the core of treatment regimens include isoniazid (INH), rifampin (RIF), ethambutol (EMB), and pyrazinamide (PZA). These medications must be taken for 6 - 12 months.

How can tuberculosis be prevented?
Those with latent tuberculosis infection (LTBI) should complete a 6-9 month course of INH.

Iowa Department of Public Health
Promoting and Protecting the Health of Iowans

Mariannette Miller-Meeks, B.S.N., M.Ed., M.D.
Director

Terry E. Branstad
Governor

Kim Reynolds
Lt. Governor

Tuberculosis Control Program

Patient Information Sheet for Treatment of Latent Tuberculosis Infection

For patients receiving preventative therapy with Isoniazid or Rifampin, the Department of Public Health requests the following data for epidemiological purposes. Please complete this form and return in the enclosed postage paid envelope or **fax it to 515-281-4570**. Thank you.

M. Patricia Quinlisk, M.D.
State Epidemiologist and Medical Director

Date: _____

Name: _____ Sex: M F

Address: _____ Phone: (____)_____

City: _____ Zip: _____ County: _____

Date of birth: _____

Mantoux skin test date: _____ Results: _____mm
Results should be read and recorded in mm of induration only and should not include area of erythema.

Chest x-ray date (***Please include chest x-ray report with fax***) _____
Normal_____ Abnormal_____
Has TB disease been ruled out? Yes_____
No_____

Diagnosis: Latent Tuberculosis Infection: Yes____ No____
Planned course of treatment: INH 300 mg qd x: 9 months_____ 6 months_____ Other: _____
(Attach Prescription)
Pyridoxine (Vit. B6): 25 mg qd x 6months_____ or 9 months_____ ***(Available for medical conditions in which neuropathy is common – diabetes, uremia, alcoholism, malnutrition, HIV infection, pregnancy).***

Suspected TB Disease/Confirmed TB Disease
Please report all suspected cases of TB disease by phone:
Nurse Consultant – 515-281-8636 or Program Manager – 515-281-7504

Physician: _____ Phone: (____)_____

Address: _____

City: _____ Zip: _____

Person making referral: _____ Phone: (____)_____

Please send medication to (circle one): ***County Public Health Department***
OR
Physician's Office

TULAREMIA

Report Immediately by phone
If bioterrorism suspected

Potential Bioterrorism Agent: Category A

Also known as: Rabbit Fever, Deer Fly Fever

Responsibilities:
Lab: **Report immediately** by phone if bioterrorism suspected, otherwise weekly
Physician: Report immediately by phone if bioterrorism suspected, otherwise weekly
Local Public Health Agency (LPHA): Report immediately by phone if bioterrorism suspected.
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Francisella tularensis is a gram-negative bacterium. Two types occur in the United States: Type A is biovar tularensis and Type B is biovar palaeoarctica. Type A is more virulent than Type B and has a lower infective dose.

B. Clinical Description

Symptoms: There are at least six types of clinical symptoms, depending on the route of infection and the strain of bacteria present. Nearly all cases have a rapid onset of fever. If bacteremia develops it may last for two weeks in untreated cases. Lesions may contain the bacteria for a month. The most common categories of illness are as follows:

Ulceroglandular: Patients have large, tender lymph nodes and a non-healing skin ulcer at the site of infection, often with fatigue, chills, and malaise.

Glandular: Patients have one or more enlarged painful nodes that may be filled with purulent exudate.

Pneumonic (pulmonary): This may be a primary infection following inhalation of the organisms or secondary to bacteremia; plague-like symptoms that may include a non-productive cough, difficulty breathing and chest pain. Patchy infiltrates may be seen on the chest X-ray.

Typhoidal: This is a rare form, with enlarged and inflamed mesenteric lymph nodes, septicemia, abdominal pain, diarrhea, vomiting and gastrointestinal bleeding.

Oropharyngeal: This form results from ingestion of bacteria in food or water leading to painful pharyngitis, abdominal pain, diarrhea, and vomiting.

Oculoglandular: Patients have painful, purulent conjunctivitis with enlarged lymph nodes of the neck or near the ears and usually accompanied with fever, chills and malaise.

Onset: Most cases have a rapid onset of fever. Symptoms usually appear 3 to 5 days after exposure to the bacteria, but can take as long as 14 days.

Complications: The case fatality of type A tularemia is 5% - 15% if untreated. The case fatality rate in pneumonic or primary septicemia is 30 to 60% if untreated. Pneumonia may complicate all clinical types of tularemia and requires prompt identification and specific treatment to prevent fatal outcomes.

C. Reservoirs

Common reservoirs: Type A infections are acquired from rabbits or *Dermacentor* ticks, including the common dog tick or wood tick.

Less common reservoirs: Type B infection is associated with a wide variety of mammalian hosts: rabbits, hares, and some rodents such as beavers and muskrats are particularly important. Ticks, mosquitoes, and deer flies may serve as vectors for the disease. Humans, however, do not usually transmit the infection to others.

D. Modes of Transmission

Spread: Tularemia may have the most varied modes of spread of any bacterial agent.

- Direct Contact: This can occur when skinning or dressing game.
- Arthropod Vector: The bacteria may be spread by the bite of tick, either *Dermacentor andersoni* (wood tick) or *D. variabilis* (dog tick) or amblyomma americana (lone star tick) or a bite from deer flies or horse flies.
- Ingestion: Through contaminated food such as undercooked rabbit meat or drinking contaminated water.
- Inhalation: Infectious aerosols can be generated when handling animal carcasses or cleaning areas where there may be dried rodent carcasses, running over a rabbit's nest with the lawn mower, or from the dust generated while moving contaminated hay, grain or soil.
- No direct person-to-person transmission

Survival of Organism: *Francisella tularensis* can survive for weeks to months in cool water or mud, for up to 3 months in tap water and in dry straw for as long as 6 months. Routine water purification is very effective at killing *F. tularensis.*

E. Incubation period

The incubation period ranges from 1 - 14 days, but is usually 3 - 5 days.

F. Period of Communicability or Infectious Period

The infectious agent may be found in the blood of untreated patients during the first two weeks of disease and in lesions for a month or more. Flies can remain infective for 14 days after infection and ticks through their lifetime. Rabbit meat frozen at 5° F can remain infective for over three years.

G. Epidemiology

Tularemia is found throughout North America and in many parts of continental Europe, Russia, China and Japan. In the United States, it occurs all months of the year. It is a risk for hunters during the fall and early winter, for lawn care workers in the summer when mowing over rabbits, providing an aerosol, and in spring in summer for children when ticks and flies are most prevalent. Type A tularemia is found only in North America where it is common in rabbits and is transmitted by a tick bite. Type B strains in North America are found in mammals other than rabbits.

H. Bioterrorism Potential

Category A: *Francisella tularensis* is considered a possible weapon of bioterrorism. If the organism were effectively disseminated it could cause a serious challenge to limit the numbers of casualties and to control other repercussions of an attack.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To determine cases and clusters of cases that could be associated with a bioterrorism event
- To focus prevention and control efforts
- To determine whether a source of infection may be a public health concern

B. Laboratory and Healthcare Provider Reporting Requirements

Tularemia requires immediate reporting if the provider reasonably believes or suspects that that *Francisella tularensis infection may be the result of a deliberate act of terrorism.* Tularemia is also reportable if it is a cause or suspected cause of an outbreak, which would be an uncommon situation given its usual modes of spread.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides services for testing clinical specimens for *Francisella tularensis* and for confirmation of isolates from sentinel laboratories. Sentinel laboratories can send specimens (blood, tissue biopsies, discharge fluid, vesicle fluid, etc.) to SHL. Isolates submitted from other laboratories will be confirmed and/or identified. Additionally, all laboratories are asked to submit all isolates cultured for further identification to aid in the public health surveillance and necessary to prevent the spread of this disease. SHL must be contacted before samples are submitted for safety purposes. For more information on submitting samples, contact SHL at 319-335-4500, or visit: www.shl.uiowa.edu/

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting a case that is NOT SUSPECTED of being related to bioterrorism is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation: Investigation of cases is directed by the Iowa Department of Public Health Center for Acute Disease Epidemiology (CADE). The cooperation of local public health agencies, laboratories, and medical providers is requested.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Standard Precautions. Quarantine is not required.

B. Protection of Contacts of a Case

No prophylaxis for contacts to a case is necessary. Standard Precautions for inpatients with a draining lesion or for pulmonary symptoms should be used.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If an outbreak is suspected, it should be reported immediately due to seriousness of illness and potential of intentional infection.

Exposure of a Laboratory Worker

Requires immediate reporting so prophylactic treatment may be implemented.

D. Preventive Measures

Environmental Measures

In general, environmental measures are unnecessary. If contaminated water or food or agricultural materials are suspected, action should be taken in consultation with the Center for Acute Disease Epidemiology.

Preventive Measures/Education

- Hunters should wear gloves when skinning wild game, keep their hands/gloves away from their eyes and thoroughly wash their hands after handling wild game carcasses. Wild game meat should be cooked "well done" (to at least 150° F/65° C).
- Drink only treated water when in wilderness areas to avoid bacterial and protozoan diseases that can be transmitted via surface water.
- Use DEET-based insect repellents to reduce the possibility of fly or tick bites. Use insect repellants properly. Repellants that contain DEET (N,N-diethyl-*m*-toluamide) should be used in concentrations no higher than 15% for children and 30% for adults. Avoid overuse of DEET-based products; excess application can lead to adverse reactions. Remember, repellants should *never* be used on infants. Permethrin is a repellant that can only be applied onto clothing, *not* exposed skin.
- Avoid tick-infested areas. In areas where contact with ticks may occur, individuals should be advised of the following:
- Wear long-sleeved shirts and long, light-colored pants tucked into socks or boots.
- Stay on trails when walking or hiking and try to avoid high grass.
- After each day spent in tick-infested areas, check yourself, your children, and your pets for ticks. Parts of the body ticks like most include the back of the knee, armpit, scalp, groin, and back of the neck.
- Promptly remove any attached tick using fine-point tweezers. The tick should not be squeezed or twisted, but grasped close to the skin and pulled straight out with steady pressure. Once removed, the tick should be drowned in rubbing alcohol or the toilet.
- Notify laboratories when sending in specimens for possible cases are sent in for testing.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Tularemia can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.
CDC website: Tularemia at www.cdc.gov/Tularemia/
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 20th Edition.* Washington, DC, American Public Health Association, 2015.

Additional Resources

www.bt.cdc.gov/agent/tularemia/

FACT SHEET TULAREMIA

What is tularemia?
Tularemia is an illness that affects both animals and man. It is caused by the bacteria *Francisella tularensis*, which can live for 3 - 4 months in mud, water, or the carcasses of dead animals. Humans can catch tularemia by handling infected animals or from bites by infected flies, mosquitoes, or ticks.

What are the symptoms of an infection with tularemia?
Most people become ill in either the summer or winter. In the summer, the ticks that carry tularemia become more active. During the winter hunting season, illness can result from contact with infected rabbits (usually skinning them). Usually there is sudden onset of fever with headache and fatigue that lasts for several weeks. With skin contact or a tick bite, there will be an ulcer (open sore) with swelling of the lymph nodes (glands under the jaw and arms, neck etc.), and a rash may also be present. Eating or drinking food or water containing the bacteria, may produce a throat infection, stomach pain, diarrhea and/or vomiting. Breathing dust containing the bacteria may produce a pneumonia-like illness. Fever, chills, headache, chest pain and coughing may also occur.

How soon do symptoms appear?
Symptoms usually appear within 1 - 14 days after exposure to the bacteria. The average time is 3 - 5 days.

How is tularemia spread?
Contact with small animals such as rabbits, hares, rodents, birds, or their ticks transmit tularemia. Handling carcasses of infected animals (e.g., hunters while skinning the animal), ingesting undercooked infected meat, drinking contaminated water and inhalation of dust from contaminated soil, grain or hay transmits tularemia. It is also transmitted by tick bites but rarely is it transmitted through the bite of an infected animal (e.g., coyote, squirrel, skunk, hog, cat, or dog). It is not spread from human to human.

Who gets tularemia infection?
Any person can become infected. Numerous wild animals especially rabbits, hares, voles, muskrats, beavers and some domestic animals; as well as various hard ticks can carry or become ill with tularemia. People become infected if they spend a lot of time outdoors or are in close contact with any of the before mentioned animals or ticks.

For how long is a person infectious?
People cannot spread tularemia so this is not a concern.

What is the treatment for tularemia?
Antibiotics are prescribed and most people fully recover. If someone has been exposed, an antibiotic should be started as soon as possible.

Do infected people need to be excluded from school, work, or child care?
No, because they do not transmit the disease.

What can be done to help prevent the spread of tularemia?
Rubber gloves should be worn when skinning or handling animals, especially rabbits. Wild rabbit and rodent (such as squirrel) meat should be cooked completely before eating. Avoid tick bites, by using insect and tick repellents and wearing long sleeves and pants when spending long periods of time outside. In the spring and summer, look for attached ticks every two to three hours when spending time outside. Remove any attached ticks immediately. Avoid swimming, drinking, bathing in untreated water where infection is prevalent among wild animals. Persons working in laboratories with this bacterium must take protective measures, including the use of face masks, gowns, and impervious gloves, and negative pressure microbiological cabinets.

FACT SHEET TULAREMIA

For Health Professionals (rabbit fever, deer fly fever)

What is tularemia?
Tularemia is a zoonotic disease caused by the bacterium *Francisella tularensis*.

What are the symptoms of tularemia?
Ulceroglandular tularemia (75-85% of cases) presents with a local ulcer, painful regional lymphadenopathy, fever, chills, headache and malaise. Glandular tularemia (5-10% of cases) results in fever and tender lymphadenopathy but no skin ulcer. Typhoidal tularemia (5-15 % of cases) presents with fever, headache, malaise, substernal discomfort, prostration, weight loss and a non-productive cough. Pneumonia is very common. Oculoglandular tularemia (1-2% of cases) presents with unilateral, painful, purulent conjunctivitis with preauricular or cervical lymphadenopathy. Oropharyngeal tularemia refers to primary ulceroglandular disease confined to the throat with acute exudative or membranous pharyngotonsillitis and cervical lymphadenopathy. The case fatality rate without treatment is 5% for the ulceroglandular form and 35% for the typhoidal form. All ages are susceptible, and recovery is followed by permanent immunity.

How soon do symptoms appear?
Symptoms usually appear within 1-14 days after infection with the bacteria. Average is within 3-5 days.

How is tularemia transmitted?
Contact with small animals such as rabbits, hares, rodents, birds, and their ticks transmit tularemia. Transmission can occur when handling carcasses of infected animals (hunters while skinning), ingesting undercooked infected meat, drinking contaminated water and inhalation of dust from contaminated soil, grain or hay. It is also transmitted by tick bites and rarely through the bite of an infected animal.

Who gets tularemia infection?
Anyone can get tularemia if they spend much time outdoors in areas where ticks, deerflies and mosquitoes can be found.

How is the diagnosis made?
A high index of suspicion is associated with a compatible history of persistent skin ulcers present from handling diseased carcasses. Routine culture is possible but difficult. The diagnosis can be established retrospectively by serology. Serum antibodies usually appear in the second week of the disease. Examination of skin ulcer exudate, lymph node aspirates and other clinical specimens by Florescent Antibody (FA) test may provide rapid diagnoses. Diagnostic biopsy of actual infected lymph nodes should be done only under specific treatment since it will often induce a bacteremia.

What is the treatment for tularemia?
Streptomycin or gentamicin for 7 - 14 days is the treatment of choice.

What are the isolation precautions used for tularemia infections?
Standard Precautions are recommended for healthcare workers. Laboratory related infections with this organism do occur. Persons working in laboratories with this bacterium must take protective measures, including the use of facemasks, gowns, and impervious gloves, and negative pressure microbiological cabinets.

Is there a vaccine or post-exposure prophylaxis for tularemia?
Yes, a live attenuated tularemia vaccine is available as an investigational new drug. It is of proven effectiveness in preventing laboratory-acquired tularemia a well as in experimentally exposed human volunteers. Post-exposure prophylaxis for tularemia may include treatment with streptomycin,

gentamicin, doxycycline, or ciprofloxacin in the incubation period of tularemia and continuing treatment daily for 14 days. This might protect against symptomatic infection.

Do infected people need to be excluded from school, work, or child care?
No.

Reference:

Inglesby, TV, Henderson DA, et al. Abstract: "Consensus Statement: Tularemia as a Biological Weapon: Medical and Public Health Management" Abstracted from Journal of the American Medical Association, June 6, 2001; vol. 285, no. 21: 2763-2773. www.bt.cdc.gov/agent/tularemia/tularemia-biological-weapon-abstract.pdf

FACT SHEET TULAREMIA

For Veterinarians

What is Tularemia?

Francisella tularensis is an intercellular bacterial pathogen that causes the zoonotic disease tularemia and can affect a wide range of animals including small mammals, birds and humans. Hunters, hikers and people in rural settings are more likely to come in contact with infected rabbits or ticks that have fed on a diseased animal. The organism is spread to people from the insect bites; direct contact from skinning a wild rabbit or by preparing or eating improperly cooked game meat. Occurrence of the disease follows a bimodal cycle with higher numbers of humans infected in July due to ticks and in December due to the hunting season. Inhalation exposure can occur if large numbers of the organism are aerosolized in a confined space.

What are the clinical signs associated with tularemia?

In animals, the signs are often associated with tick infestation resulting in a high fever, weight loss and death. Sheep have been noted to abort and dogs have the ulceroglandular disease that is common in human tularemia. The organism incubates for 1 - 14 days in humans and symptoms vary with the site of entry. Most humans will present with a lymphadenitis and ulcers, if inoculated through direct contact. If infected meat was consumed, the oropharynx will be affected and gastrointestinal signs will surface.

How can infection with *Francisella tularensis* be diagnosed?

Serologic testing, with a four-fold rise in titer, is the standard method of identifying infection. Culture and inoculation of hamsters can also be performed, but poses a health risk for laboratory workers. Necropsy of animals will reveal massive organ involvement with necrosis of liver, spleen, and lymph nodes, and poses a significant health risk to the veterinarian.

How is tularemia treated?

The first step is removal of any ticks as soon as possible. The best way is to use tweezers to grab the tick as close to the skin as possible and pull it straight out. Do not squeeze the tick's body when removing it. Do not handle ticks with bare hands. Wash your hands after removing a tick. You may want to apply an antiseptic on the bite. Streptomycin or gentamycin given for 7 – 14 days is the drug of choice for humans. Tetracycline has been found to inhibit *Francisella tularensis* in sheep that have been diagnosed with tularemia abortion.

How can tularemia be prevented?

Tick and insect repellents should be used when walking in the outdoors. A thorough tick check of humans and their pets should be performed often and upon returning inside. All ticks should be removed from humans and dogs as soon as possible. Skinning wild rabbits should be performed in a well-ventilated area and protective gloves should be worn. *Francisella tularensis* is killed by heat, but not by freezing. Thorough cooking of rabbit and other game meat will render it safe for consumption, but placing raw meat in the freezer will maintain the organisms' viability. Also in recent years tularemia transmission has occurred during landscaping work or lawn mowing over or around dead animals. It is best to remove dead animals before mowing, roto-tilling, bailing or other landscaping activity.

Tularemia

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Facility phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:

Gender: ☐ Female ☐ Male ☐ Other

Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed

Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Parent/Guardian name:

Parent/Guardian phone: ( )- - Type:

EVENT

Tularemia type: ☐ Glandular ☐ Intestinal ☐ Oculoglandular ☐ Oropharyngeal ☐ Pneumonic ☐ Typhoidal ☐ Ulceroglandular

Diagnosis date: / / Onset date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of death / /

Event exception ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name:

Exposure setting:

Epi-linked: ☐ Yes ☐ No ☐ Unknown

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: Country:

Healthcare provider information

Last name:

First name:

Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA

Facility name:

Address line 1:

Address line 2:

Zip code: City:

State: County:

Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Francisella*** Type (e.g. serotype):

Laboratory: Accession #: Collection date: / /

Date received: / / Specimen source: Test type:

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Francisella*** Type (e.g. serotype):

Laboratory: _____ Accession #: _____ Collection date: / /

Date received: / / Specimen source: _____ Test type: _____

Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative

Organism: ***Francisella*** Type (e.g. serotype):

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms:

- ☐ Abdominal pain
- ☐ Chills
- ☐ Diarrhea
- ☐ Fever
- ☐ Headache
- ☐ Malaise
- ☐ Pneumonia
- ☐ Red eyes w/ discharge
- ☐ Sore throat
- ☐ Swollen lymph nodes
- ☐ Ulcer

Lesion location: _____

OTHER LAB FINDINGS

Biopsy performed: ☐ Yes ☐ No ☐ Unk Date: / / Site: _____ Result: _____

TREATMENT

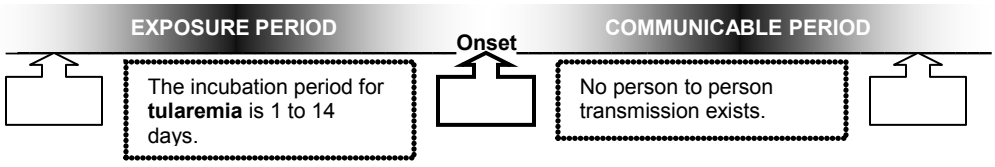
Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic: _____ Antibiotic: _____ Antibiotic: _____

Date started:	/ /	Date started:	/ /	Date started:	/ /
Dose:		Dose:		Dose:	
Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU
# of days:	# of times a day:	# of days:	# of times a day:	# of days:	# of times a day:
Route:		Route:		Route:	

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated for tularemia: ☐ Yes ☐ No ☐ Unknown

Date vaccinated:	/ /	Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:		Lot #:	
Vaccine type:		Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:		Manufacturer:	

Number of vaccinations: ____

Water Exposures – ***In the 14 days prior to the onset of symptoms:***

Untreated water drank/swallowed: ☐ Yes ☐ No ☐ Unk Untreated water source: ☐ Lake ☐ Ocean ☐ Pond ☐ Stream ☐ River

Location names:

Address: City/State/Zip: County:

Animal contact: ☐ Beavers ☐ Hares ☐ Muskrats ☐ Rats ☐ Squirrels ☐ Cats ☐ Mice ☐ Rabbits ☐ Sheep ☐ Voles

Bitten by fleas or other insects: ☐ Yes ☐ No ☐ Unk

Tick found: ☐ Yes ☐ No ☐ Unk Date found: / /

Tick species: ☐ Deer tick ☐ Dog tick ☐ Other: Tick embedded: ☐ Yes ☐ No ☐ Unk

Exposed to potential infection sources: ☐ Yes ☐ No ☐ Unk Possible tularemia sources: ☐ Laboratory ☐ Livestock handling ☐ Packing plant ☐ Unpasteurized dairy product

NOTES:

TYPHOID FEVER

Potential Bioterrorism Agent: Category B

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile mail or phone
Physician: Report by IDSS, facsimile, mail or phone
Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Typhoid fever is caused by the bacillus *Salmonella enterica* subspecies *enterica* serovar Typhi (commonly *S.* Typhi).

B. Clinical Description

Symptoms: Typhoid fever causes fever, headache, malaise, anorexia, bradycardia, splenomegaly, and constipation more often than diarrhea in adults. Rose colored spots occur on the trunk in 25% of light-skinned patients and a nonproductive cough often occurs in the early stage of illness.

Onset: Illness is usually not abrupt and varies from mild illness with low-grade fever to severe clinical disease with abdominal discomfort and multiple complications. Inapparent or mild illnesses occur, especially in endemic areas.

Complications include intestinal perforation and hemorrhage, kidney failure, and peritonitis. The case-fatality rate of 10-20% observed in the pre-antibiotic era falls below 1% with prompt antibiotic therapy. Relapses may occur in 15-20% of patients with typhoid fever.
A major concern with typhoid fever is that a carrier state may follow illness. Typhoid fever can be present in both feces and urine chronically after acute infection. The chronic carrier state is most common (2-5%) among persons infected during middle age. Carriers frequently have biliary tract abnormalities including gallstones. The chronic urinary carrier state may occur with schistosome infections.

C. Reservoirs

Common reservoirs: Humans may become transient or permanent carriers.

D. Modes of Transmission

Spread: Via ingestion of food and water contaminated by feces and urine of patients and carriers. Important vehicles for transmission include shellfish (particularly oysters) from sewage contaminated beds, raw fruit, vegetables fertilized by human feces, contaminated milk/milk products and unidentified cases. Flies may contaminate foods, allowing the organism to multiply to infectious doses. Epidemiological data suggest that waterborne transmission may involve less contamination than foodborne transmission.
Person-to-person: Rare

E. Incubation period

Depending on the inoculum size and host factors, the incubation period may range from 3 to over 60 days. The usual range is 8-14 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as infected persons excrete the bacilli in their stool or urine, usually from the first week throughout convalescence; variable thereafter. Approximately 10% of untreated typhoid patients discharge bacilli for 3 months after symptom onset; 2-5% become carriers.

G. Epidemiology

Typhoid fever has a worldwide distribution, with approximately 400 cases per year in the United States, mostly among travelers. An estimated 21 million cases of typhoid fever and 200,000 deaths occur worldwide.

H. Bioterrorism Potential

Category B Agent: As with other Salmonella organisms, S. Typhi has potential to be used as a bioweapon similar to other fecal-oral transmission agents.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a high risk for spread to others (*e.g.,* a diapered child, child care attendee, healthcare provider, or food handler) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (*e.g.* a restaurant or a commercially distributed food product) and to stop transmission from such sources.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website:
healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

C. Local Public Health Agency (LPHA) Follow-up Responsibilities

Case Investigation

a. It is the LPHA responsibility to complete an investigation by interviewing the case or legal guardian of the case and others who may be able to provide pertinent information. Using IDSS is the preferred method of conducting the investigation. Much of the information can be obtained from the case's healthcare provider or the medical record.
b. Use the following guidelines in completing the investigation:
    1. Accurately record the demographic information, date of symptom onset, symptoms, and medical information.

2. When asking about exposure history (food, travel, activities, etc.), use the usual incubation-range for typhoid fever (8 – 14 days).
3. If possible, record any restaurants at which the case ate, including food items(s) and date consumed.
4. Ask questions about travel history and outdoor activities to help identify where the case became infected.
5. Ask questions about water supply because typhoid fever may be acquired through water consumption.
6. Household/close contact, school, work, travel, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts.
7. Ask if the patient knows others who had a similar illness about the same time.
8. If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.*, the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please request help from CADE epidemiologists (800) 362-2736.

After completing the investigation and gathering the information, enter the information into IDSS, or FAX the report form with supporting laboratory documentation to (515) 281-5698 or mail (in an envelope marked "Confidential") to the IDPH/CADE mailing address.

3) CONTROLLING FURTHER SPREAD

Fluoroquinolones appear to be the drug of choice in adults. However, the recent emergence of resistance to fluoroquinolones prevents its indiscriminate use in primary care facilities. If a typhoid isolate is known to be sensitive to traditional first-line antibiotics, oral chloramphenicol, amoxicillin or trimethoprim-sulfoxazole (particularly in children) should be used in accordance with local antimicrobial sensitivity patterns. Short-term, high dose corticosteroid treatment, combined with specific antibiotics and supportive care, reduces mortality in critically ill patients.

A. Isolation and Quarantine Requirements

Hospital care is desirable during acute typhoid illness. All hospitalized patients should be on Standard Precautions. Use Contact Precautions for diapered or incontinent persons for duration of illness or to control institutional outbreaks.

Quarantine is not applicable.

B. Protection of Contacts of a Case

Administration of typhoid vaccine is of limited value for family, household and nursing contacts who have been or will be exposed to active cases. Vaccine should be considered for those exposed to carriers of typhoid.

C. Managing Special Situations

Contact the Center for Acute Disease Epidemiology (CADE), (800) 362-2736, for consultation for persons identified as chronic carriers or who continue to have positive stool cultures after acute disease.

In the case of situations that are not covered below contact CADE, (800) 362-2736, for consultation.

Food handlers

Return to work should be after 3 consecutive negative stool cultures (and urine in patients with schistosomiasis) at least 24 hours apart and at least 48 hours after completion of antimicrobials.

Hand hygiene education shall occur before return to work. Good hand hygiene must be practiced at all times.

Child care/School

Since typhoid fever can be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases in a child care setting. General recommendations for typhoid fever include:

- For staff or children 5 years of age and older who are fecally continent, 24 hours without a diarrheal stool is required before returning.
- For children younger than 5 years of age or individuals who are diapered or fecally incontinent, 3 consecutive negative stool cultures (and urine in patients with schistosomiasis) at least 24 hours apart and at least 48 hours after completion of antimicrobials are required before returning.
- Good hand hygiene must be practiced at all times.

Business

Since typhoid fever can be transmitted person–to-person through fecal-oral transmission, it is important to follow up carefully on each case. General recommendations include:

- For staff (exception for food handlers), 24 hours without a diarrheal stool is recommended before returning to a business setting.

- Staff with *S. typhi* in their stool who do not have diarrhea or vomiting and do not handle food may remain if proper hygienic practices are maintained.

- Good hand hygiene must be practiced at all times.

Health Care Provider

Return to work should be after 3 consecutive negative stool cultures (and urine in patients with schistosomiasis) at least 24 hours apart and at least 48 hours after completion of antimicrobials. Good hand hygiene must be practiced at all times.

Reported Incidence Is Higher than Usual/Outbreak Suspected

Any case of typhoid fever is unusual in the U.S, so it is important to determine the source of infection and mode of transmission. Careful follow-up of cases to ensure proper isolation and identify "chronic carrier" status is important. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the regional epidemiologist or CADE if assistance is needed. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross jurisdictional lines.

D. Preventive Measures

Environmental Measures

Proper sanitation of public and private facilities is critical to prevent typhoid fever. Routine sanitation measures should include:

- Education of the public regarding proper handwashing, which includes providing suitable handwashing facilities in public places, especially in food service, child care, or health care settings.
- Proper disposal and treatment of human sewage. Latrines should be fly-proof and properly designed and situated.
- Public and private water supplies should be protected, purified, and chlorinated (as needed). Backflow prevention devices should be installed between potable water and non-potable water systems.
- Scrupulous cleanliness in food preparation and handling are important. Proper temperature maintenance of raw and cooked foods is critical, as well as avoiding cross contamination of raw meats and items already prepared to eat.

- All milk and milk products should be pasteurized before consumption.
- Limit the collection and marketing of shellfish to supplies from approved sources.

Education

To avoid possible exposures, recommend that people:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers. This is important for the entire household of a case as household members can become transient or long term carriers.
- Dispose of feces in a sanitary manner in all settings.
- Keep food that will be eaten raw, such as vegetables, from becoming contaminated by animal-derived food products. Wash all foods that will be eaten raw before eating.
- Receive typhoid vaccination when traveling to endemic high-risk areas. Visit www.cdc.gov/travel/ for current information on endemic high-risk areas. The World Health Organization (WHO) also recommends that school-age children who live in such areas receive vaccination. An oral, live vaccine is available and usually consists of 3-4 doses.
- In non-endemic areas there is no recommendation for vaccine except for those who are subject to unusual occupational exposures (e.g. clinical microbial technicians or household members of known carriers).

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Typhoid Fever can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

CDC web site, Typhoid Fever. www.cdc.gov/nczved/divisions/dfbmd/diseases/typhoid_fever/
Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Additional Resources

IDPH web site: www.idph.state.ia.us/adper/
World Health Organization site: www.who.int/topics/typhoid_fever/en/

FACT SHEET TYPHOID FEVER

What is typhoid fever?
Typhoid fever is an illness caused by the germ *Salmonella* Typhi. In the United States about 400 cases are reported each year. Most of these are acquired while traveling outside of the U.S. Typhoid fever is still common in the developing world, where it affects about 21 million persons each year.

Who gets typhoid fever?
Anyone can catch it, but it is more common in less-developed countries. People in the U.S. usually get typhoid fever when traveling to countries where it is common.

How is typhoid fever spread?
People with typhoid fever have the germ in their feces (stool) or urine. If they do not wash their hands after using the restroom, it can be spread to others. Food may also become contaminated by the unwashed hands of an infected food handler.

What are the symptoms of typhoid fever infection?
People with typhoid fever may have fever, headache, general discomfort, loss of appetite, and constipation more often than diarrhea in adults. Typhoid fever can be very serious, especially in the very young or very old.

How soon after infection with typhoid fever do symptoms appear?
Symptoms usually occur 8 - 14 days after infection, with a range of 3 – 60 days.

Where are typhoid fever bacteria found?
The germ that causes typhoid fever is found in the feces (stool) of people who have the infection. It is not naturally occurring in most communities in the U.S. Some people can carry the bacteria for long periods of time without illness, and can still spread it to others.

How long can an infected person carry typhoid fever?
For several days and possibly several months. Tests can show if people are still carrying the bacteria.

Do infected people need to be excluded from work or school?
Since the bacteria that causes typhoid fever is found in the feces (stool), ill people with should not go to school or work until 24 hours have passed without a watery or liquid stool. Health care providers and food handlers should have 3 negative cultures of feces before returning to work. For school staff (who are not food handlers) or children 5 years of age and older (who are not in diapers and have control of their bowels), 24 hours without a diarrheal stool is required before returning. When returning to work or school, it is very important that careful handwashing is done after using the toilet and before handling food.

Do infected people need to be excluded from child care?
Since the bacteria that causes typhoid fever is found in the feces (stool), children younger than 5 years of age who are in diapers, or who do not have control of their bowels should not go to child care until 3 negative stool cultures are obtained after treatment with antibiotics. Staff or children 5 years of age and older who are not in diapers and have control of their bowels, should not return until 24 hours without a diarrheal stool has passed. When returning to child care it is important that careful handwashing is done after using the toilet and before handling food.

What is the treatment for typhoid fever?
Antibiotics are used to treat typhoid fever.

How can typhoid fever be prevented?
- Always wash hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.

- People who are ill with typhoid fever should be excluded from handling food and providing patient care.
- All milk and milk products should be pasteurized before consumption.
- Get typhoid vaccination when traveling to high-risk areas outside of the U.S.
- When traveling to countries where typhoid fever is more common, drink bottled water, eat only properly cooked food or fruits and vegetables that can be peeled and avoid ice in drinks. Go to wwwn.cdc.gov/travel/default.aspx or check with your health care provider or health department for more advice on safe travel.

Typhoid fever
(including paratyphoid)

Agency: ______

Investigator: ______ Phone number: ______

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: ______
First and middle name: ______
Maiden name: ______ Suffix: ______
Address line: ______
Zip: ______ City: ______
State: ______ County: ______
Facility phone: ( )- - Type: ______
Long-term care resident: ☐ Yes ☐ No ☐ Unknown
Facility name: ______

Date of Birth: / / Estimated? ☐ Age: ______
Gender: ☐ Female ☐ Male ☐ Other ____
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Black or African American ☐ Hawaiian or Pacific Islander ☐ Unknown ☐ White ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name: ______
Parent/Guardian phone: ( )- - Type: ______

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name: ______
Exposure setting: ______
Epi-linked: ☐ Yes ☐ No ☐ Unk To whom: ______
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: ______ Country: ______

Healthcare provider information

Last name: ______
First name: ______
Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name: ______
Address line 1: ______
Address line 2: ______
Zip code: ______ City: ______
State: ______ County: ______
Phone : ( )- - Type: ______

LABORATORY FINDINGS

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Salmonella*** Type (e.g. serotype): ☐ *Typhi* ☐ Paratyphi B ☐ Paratyphi A ☐ Paratyphi C

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Salmonella*** Type (e.g. serotype): ☐ *Typhi* ☐ Paratyphi B ☐ Paratyphi A ☐ Paratyphi C

Laboratory: ______ Accession #: ______ Collection date: / /
Date received: / / Specimen source: ______ Test type: ______
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: ***Salmonella*** Type (e.g. serotype): ☐ *Typhi* ☐ Paratyphi B ☐ Paratyphi A ☐ Paratyphi C

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

OTHER DEMOGRAPHIC INFO

Citizenship: _____ ☐ Unknown

CLINICAL INFO & DIAGNOSIS

Was the patient ill with typhoid or paratyphoid fever? ☐ Yes ☐ No ☐ Unk
Removed "Date of onset" associated with above question. No need for it.

Fever: ☐ Yes ☐No ☐ Unk Fever onset date: / / Duration: Hours/Days

Highest known fever: C/F Rash or rose spots: ☐ Yes ☐No ☐ Unk Onset date: / /

Symptoms:
☐ Abdominal cramps ☐ Diarrhea ☐ Malaise ☐ Rash ☐ Vomiting
☐ Anorexia ☐ Fever ☐ Muscle weakness ☐ Splenomegaly
☐ Chills ☐ Headache ☐ Nausea ☐ Visible bloody diarrhea

OTHER LAB FINDINGS

PFGE Pattern (stool specimen from patient)
Was PFGE performed: ☐ Yes ☐ No ☐ Unk

IA-XbaI Pattern		IA-BlnI Pattern		CDC-XbaI Pattern		CDC-BlnI Pattern	

Was antibiotic sensitivity testing performed? ☐ Yes ☐ No ☐ Unk
If Yes, was the organism resistant to:
Ampicillin ☐ Yes ☐ No ☐ Unk
Chloramphenicol ☐ Yes ☐ No ☐ Unk
Tremthoprim-sulfamethozazole ☐ Yes ☐ No ☐ Unk
Floroquinolones ☐ Yes ☐ No ☐ Unk

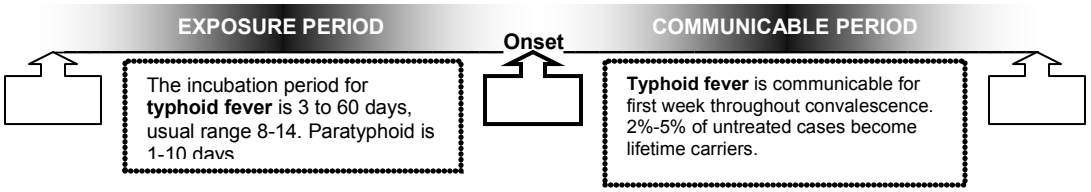
TREATMENT

Antibiotics prescribed? ☐ Yes ☐ No ☐ Unknown

Antibiotic:		Antibiotic:		Antibiotic:	
Date started:	/ /	Date started:	/ /	Date started:	/ /
Dose:		Dose:		Dose:	
Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU	Unit:	☐ mg ☐ ml ☐ IU
# of days:	# of times a day:	# of days:	# of times a day:	# of days:	# of times a day:
Route:		Route:		Route:	

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Vaccinated for typhoid fever within 5 years of onset: ☐ Yes ☐ No ☐ Unknown

Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:	
Vaccine type:	☐ Killed typhoid shot ☐ Oral Ty21a or Vivotif four pill series ☐ ViCPS or Typhim Vi shot	Vaccine type:	☐ Killed typhoid shot ☐ Oral Ty21a or Vivotif four pill series ☐ ViCPS or Typhim Vi shot
Manufacturer:		Manufacturer:	

Number of vaccinations: ____

Risk Factors/Travel Information – *In the 60 days prior to onset of symptoms had the case:*

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk	City in Iowa:	Departure date: / /	Return date: / /
Traveled within U.S.? ☐ Yes ☐ No ☐ Unk	State: City:	Departure date: / /	Return date: / /
Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk	Country:	Departure date: / /	Return date: / /

Lived outside of the United States? ☐ Yes ☐ No ☐ Unknown

Country:	Date of most recent return or entry to the U.S.: / /
Country:	Date of most recent return or entry to the U.S.: / /
Country:	Date of most recent return or entry to the U.S.: / /

What was the purpose of the international travel?

☐ Business
☐ Tourism
☐ Visiting relatives or friends
☐ Immigration to U.S.
☐ Other

Visited restaurants? ☐ Yes ☐ No ☐ Unknown

If Yes, complete the table below: *County and address are missing from this table*

Restaurant	City/State/Zip	Date visited	Foods eaten	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Attended Group Gatherings (e.g. weddings, parties)? ☐ Yes ☐ No ☐ Unknown
If Yes, complete the following table:

Location of gathering	City/State/Zip	Date visited	Foods eaten	Others ill?
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk
		/ /		☐ Yes ☐ No ☐ Unk

Contact with foreign travelers: ☐ Yes ☐ No ☐ Unknown **Contact with human excreta:** ☐ Yes ☐ No ☐ Unknown

Dietary Information – *In the 60 days prior to onset of symptoms did the case consume the following:*

Seafood

Shellfish: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Unpasturized products

Unpasteurized milk: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Unpasteurized juice: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Other unpasteurized products: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Fruits and vegetables

Raw fruits: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Raw vegetables: ☐ Yes ☐ No ☐ Unk From dates consumed: / / To dates consumed: / /
List all source/types: List all brand names:

Animal Exposures – *In the 60 days prior to the onset of symptoms did the case have the following exposures:*
Check all that apply

Visit or live on a farm: ☐ Yes ☐ No ☐ Unknown
Exposed to manure: ☐ Yes ☐ No ☐ Unknown
Farm animal contact: ☐ Yes ☐ No ☐ Unknown Animals:
Reptile contact: ☐ Yes ☐ No ☐ Unknown ☐ Iguana ☐ Lizard ☐ Turtle ☐ Snake ☐ Other _____
Reptile lived with case: ☐ Yes ☐ No ☐ Unknown

CONTACTS

Number of people living in case's household: ____

Are there close contacts of the case with similar symptoms: ☐ Yes ☐ No ☐ Unknown

Close contacts with similar symptoms and/or exposures

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse	☐ Sexual contact		/ /	☐ Restaurant	☐ Yes
☐ Child	☐ Family member (non-household)			☐ Gatherings	☐ No
☐ Sibling	☐ Friend/acquaintance			☐ Food	
☐ Roommate	☐ Contact- work/school/etc			☐ Animal	
☐ Parent/ guardian	☐ Unknown/Other			☐ Water	

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

Name	DOB	Gender	Address/Phone
	/ /	☐ Male ☐ Female	Zip code: Phone: - -

Relationship to case:		List symptoms	Symptom onset date	Same exposures	Is contact a case?
☐ Spouse ☐ Child ☐ Sibling ☐ Roommate ☐ Parent/ guardian	☐ Sexual contact ☐ Family member (non-household) ☐ Friend/acquaintance ☐ Contact- work/school/etc ☐ Unknown/Other		/ /	☐ Restaurant ☐ Gatherings ☐ Food ☐ Animal ☐ Water	☐ Yes ☐ No

If this contact is a case create a new event and/or case for this contact.

NOTES: ______________________________


Diseases U-V-W

Report immediately by phone

VIRAL HEMORRHAGIC FEVER

Potential Bioterrorism Agent: Category A

Also known as: VHF

Includes: Lassa, Marburg, Ebola, Crimean-Congo, South American

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Responsibilities:
Hospital: Report by phone immediately
Lab: Report by phone immediately, Send isolates to State Hygienic Laboratory (SHL) for confirmation
Physician: Report by phone immediately
Local Public Health Agency (LPHA): Iowa Department of Public Health will lead the follow-up investigation. Follow up will be entered in IDSS.
Iowa Department of Public Health
Disease Reporting Hotline: (800)-362-2736
After Hours: Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Viral hemorrhagic fevers (VHFs) include numerous zoonotic diseases, all of which cause a hemorrhagic syndrome in humans. VHFs are known to be caused by filoviruses, arenaviruses, bunyaviruses, and flaviviruses. Some of the specific VHFs include Ebola, Marburg, Lassa, Junin (Argentine VHF), Machupo (Bolivian VHF), Sabia (Brazilian VHF), Guanarito (Venezuelan VHF), Crimean Congo hemorrhagic and Rift Valley fever. Because of its extremely high fatality rate and the importation of the virus into the United States in non-human primates, Ebola hemorrhagic fever has been the most publicized in the United States. VHFs have been recognized by the Centers for Disease Control and Prevention (CDC) as being among the top agents of concern for potential bioterrorist weapons.

B. Clinical Description

The onset of viral hemorrhagic fever is usually sudden. The duration of illness can vary from a few days to a couple of weeks. Patients may present with a brief prodrome characterized by nonspecific signs, including fever, headache, malaise, weakness, irritability, dizziness, muscle aches, and nausea and vomiting. As signs progress, they may include low blood pressure, sustained fever, sweats, rash, diarrhea, swelling around the eyes, flushing, and redness of the eyes. As signs become more serious, the patient becomes prostrate and may develop pain in the throat, chest, or abdomen, as well as petechiae and ecchymoses (bruises). Bleeding occurs from mucous membranes (including nosebleeds, and bleeding gums, vomit, urine, stools and sputum), and the patient will often go into shock. Encephalopathy, hepatitis, intention tremors, and reduced white blood cell and platelet levels are frequently seen, and renal failure may occur. Mortality rates for VHFs vary depending on the agent and strain, and can be from 10% to 90%.

C. Reservoirs

Many wild and domestic animals, ticks, and mosquitoes are known to carry some of the VHF agents, although the reservoirs have not been identified for all VHF agents. Rodents are known to be the carriers of Lassa, Junin, Machupo, Guanarito, Crimean Congo hemorrhagic and Rift Valley fever viruses. Mosquitoes, ticks and animals (including rodents, foxes, hares, and groundfeeding birds) are known to carry bunyaviruses that cause VHF. Primates are the only non-human animals known to have been affected by Ebola and Marburg hemorrhagic fever viruses. However, because these infections are associated with a rapid and often fatal illness in these animals, they are not considered reservoirs. Once certain VHF viral infections establish themselves in human populations, rapid person-to-person spread may occur.

D. Modes of Transmission

The mode of transmission for index cases of VHF in any outbreak is animal, tick or mosquito to human. Once a human has acquired infection with a VHF agent, transmission may occur person-to-person. Persons become infected through contact with infectious blood or secretions from infected persons or animals. Individuals have acquired VHFs through sexual contact. Bedding or other fomites may serve as a source of infection. Medical equipment that has not been properly cleaned or sterilized has been responsible for the spread of some VHFs, and laboratory workers manipulating specimens have acquired rare cases. For most VHFs, direct physical contact with infectious blood or secretions is thought to be required for transmission. However, for some VHFs, such as some of the arenaviruses, aerosol spread is considered likely.

E. Incubation period

The incubation periods for VHFs range from 1 to 21 days, with an average of 3 to 10 days.

F. Period of Communicability or Infectious Period

Infected individuals are generally considered infectious for a variable period preceding the onset of symptoms (up to about 3 weeks for some VHFs) and during the course of clinical symptoms. Virus may remain in the blood and secretions for months after an individual recovers. Contaminated bedding and medical equipment may remain infectious for several days.

G. Epidemiology

Viruses of VHFs are primarily infectious agents in wild animals, birds, mosquitoes and ticks. Individual VHFs occur in different geographic regions. Outbreaks, when they occur, tend to be sporadic. Outbreaks of Ebola virus hemorrhagic fever in imported non-human primates used for research have occurred in the U.S. In one instance, individuals working with infected primates developed antibody to Ebola, suggesting exposure, but the individuals did not become clinically ill. There is speculation that this particular strain of Ebola virus (called Ebola Reston) may be unable to cause clinical disease in humans.

H. Bioterrorist Potential

Category A The viruses that cause VHFs are considered potential bioterrorist agents. If acquired and properly disseminated, these viruses could cause a serious public health challenge in terms of ability to limit the numbers of casualties and control other repercussions from such an attack.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Local Public Health Agency Follow-up Responsibilities:

Case Investigation

a. The most important thing a LPHA can do upon learning of a suspect or confirmed case of viral hemorrhagic fever, or potential exposure, is to immediately call IDPH, CADE, any time at (800) 362-2736.

b. Iowa Department of Public Health will lead the follow-up investigation. Call the Center for Acute Disease Epidemiology immediately at (800) 362-2736.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and healthcare provider immediately report any suspicion of viral hemorrhagic fever called to your attention by a healthcare provider or laboratory.

The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736, if calling after business hours, call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

Laboratory Testing Services Available

Consult with CADE and the University of Iowa State Hygienic Laboratory (SHL) for any questions about laboratory testing.

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

a. The most important thing a LPHA can do upon learning of a suspect or confirmed case of viral hemorrhagic fever, or potential exposure to viral hemorrhagic fever, if bioterrorism is suspected, is to immediately call IDPH any time at (800) 362-2736.

b. Case investigation of viral hemorrhagic fever in Iowa residents will be directed by IDPH. If a bioterrorism event is suspected, IDPH and other response authorities will work closely with LPHAs and provide instructions/information on how to proceed.

c. Following immediate notification of IDPH, the LPHA may be asked to assist in investigating cases that live within their communities, including gathering the following:
   1) The case's name, age, address, phone number, status (hospitalized, at home, deceased), and parent/guardian information, if applicable.
   2) The name and phone number of the hospital where the case is or was hospitalized.
   3) The name and phone number of the case's attending physician.
   4) The name and phone number of the infection prevention staff at the hospital.
   5) If the patient was seen by a healthcare provider before hospitalization, or seen at more than one hospital, be sure to document these names and phone numbers as well.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

All efforts to isolate or quarantine cases or their contacts of viral hemorrhagic fevers will depend on exactly which viral hemorrhagic fever is identified and will be directed by the Iowa Department of Public Health.

4) ADDITIONAL INFORMATION

References

CDC. Viral Hemorrhagic Fever website: wwwnc.cdc.gov/travel/yellowbook/2012/chapter-3-infectious-diseases-related-to-travel/viral-hemorrhagic-fevers.htm

Heymann, D.., ed., *Control of Communicable Diseases Manual, 19th Edition*. Washington, DC, American Public Health Association, 2008.

FACT SHEET Viral Hemorrhagic Fevers

What are viral hemorrhagic fevers?
Viral hemorrhagic fevers (VHFs) refer to a group of illnesses that are caused by several distinct families of viruses. VHF is used to describe a severe syndrome of illnesses that may affect multiple organ systems in the body. Usually the overall vascular system is damaged and the body's ability to regulate itself is impaired. Some types of VHF cause relatively mild illnesses, but many of these viruses cause severe, life-threatening disease, such as Ebola, Lassa, Crimean-Congo and Marburg.

What are the symptoms of an infection with viral hemorrhagic fevers?
Specific signs and symptoms vary by the type of VHF, but initial signs and symptoms often include fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. People with severe cases of VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, and ears. Severely ill cases may develop shock, nervous system malfunction, coma, delirium, and seizures.

How soon do symptoms appear?
Depending on the specific virus involved, symptoms can appear within 1 to 21 days after exposure.

How are viral hemorrhagic fevers spread?
Most VHF viruses are zoonotic. This means that these viruses naturally reside in an animal reservoir host or arthropod vector. Rodents and arthropods are likely the main reservoirs for the viruses that cause VHFs. The hosts of some VHFs remain unknown such as with Ebola and Marburg viruses.

VHF viruses are initially transmitted to humans when the activities of infected hosts and humans overlap, as follows:

- VHFs carried in rodents are transmitted to humans when they come into contact with rodent urine, fecal matter, saliva, or other secretions.
- VHFs associated with arthropod vectors are spread most often when the vector mosquito or tick bites a human, or when a human crushes a tick into a small wound.
- Humans may become infected when caring for or slaughtering livestock that have become infected.
- Some VHFs (Ebola, Marburg, Lassa, others) can spread directly from one person to another. This can occur directly, through close contact with infected body fluids, or indirectly through contact with objects contaminated such as needles with infected body fluids.

Who gets viral hemorrhagic fever infections?
Viruses that cause VHFs are distributed over much of the globe. However, since each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species lives. Therefore, the risk of getting VHFs caused by these viruses is restricted to those areas.

Although people usually become infected only in areas where the host lives, occasionally people become infected by a host that has been exported from its native habitat, or by a person who gets infected and travels elsewhere.

For how long is a person infectious?
This is not known with certainty for all VHFs. As long as the blood and secretions of an infected person contain the virus, a person is infectious. This has ranged to over 2 months in some cases.

What are the treatments for viral hemorrhagic fevers?
Patients generally receive supportive therapy since there is no other treatment or established cure for VHFs. Some antiviral drugs have been effective in treating individuals with VHFs.

Do infected people need to be excluded from school, work, or child care?
Yes, for those VHFs that can be transmitted from one person to another. Ill persons should remain home until testing shows a they are no longer infectious.

What can be done to help prevent the spread of viral hemorrhagic fevers?
Avoiding close physical contact with infected people and their body fluids is the most important way of controlling the spread of disease.

Prevention efforts also include avoiding contact with animal or insect host species which includes:

- Controlling rodent populations
- Discouraging rodents from entering or living in homes and workplaces
- Safe cleanup of rodent nests and droppings
- Appropriate control of arthropod vectors
- Use of insect repellent

Viral Hemorrhagic Fever

Agency:

Investigator: Phone number:

FOR STATE USE ONLY
Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case
Reviewer initials:
Referred to another state:

CASE

Last name: First and middle name: Maiden name: Suffix: Address line: Zip: City: State: County: Phone: ( )- - Type: Long-term care resident: ☐ Yes ☐ No ☐ Unknown Facility name:

Date of Birth: / / Estimated? ☐ Age:
Gender: ☐ Female ☐ Male ☐ Other
Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /
Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed
Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian
Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown
Parent/Guardian name:
Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /
Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Outbreak related: ☐ Yes ☐ No ☐ Unknown
Outbreak name:
Exposure setting:
Epi-linked: ☐ Yes ☐ No ☐ Unknown
Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown
State: Country:

Healthcare provider information

Last name:
First name:
Provider time: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA
Facility name:
Address line 1:
Address line 2:
Zip code: City:
State: County:
Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Type (e.g. serotype):

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Type (e.g. serotype):

Laboratory: Accession #: Collection date: / /
Date received: / / Specimen source: Test type:
Result type: ☐ Preliminary ☐ Final Result date: / / Result: ☐ Positive ☐ Negative
Organism: Type (e.g. serotype):

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

Occupation type: _____ Job title: _____
Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____
Date worked from: / / Address: _____
Date worked to: / / Zip code: _____
Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____
Date removed: / / Phone: ( )- - Type: _____
Handle food: ☐ Yes ☐ No ☐ Unknown
Attend or provide child care: ☐ Yes ☐ No ☐ Unknown
Attend school: ☐ Yes ☐ No ☐ Unknown
Work in a lab setting: ☐ Yes ☐ No ☐ Unknown
Work in a health care setting: ☐ Yes ☐ No ☐ Unknown
Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown
Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry): _____
Admission date: / / Discharge date: / / Days hospitalized: _____
Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Symptoms: ☐ Diarrhea ☐ Fever ☐ Headache ☐ Maculopapular rash ☐ Malaise ☐ Muscle pain ☐ Renal failure ☐ Shock ☐ Sore throat ☐ Vomiting

OTHER LAB FINDINGS

Thrombocytopenia: ☐ Yes ☐ No ☐ Unknown **Lymphopenia:** ☐ Yes ☐ No ☐ Unknown

TREATMENT

Antivirals prescribed: ☐ Yes ☐ No ☐ Unknown

Antiviral: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____
# of times a day: _____
Route: _____

Antiviral: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____
# of times a day: _____
Route: _____

Antiviral: _____
Date started: / /
Dose: _____
Unit: ☐ mg ☐ ml ☐ IU
# of days: _____
# of times a day: _____
Route: _____

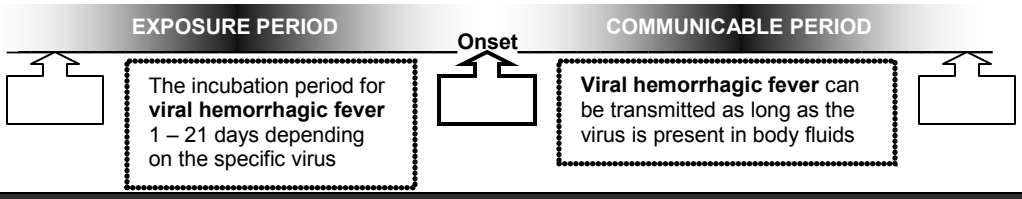
Therapeutic medications prescribed? ☐ Yes ☐ No ☐ Unk

List medications: _____

_____

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Risk Factors/Travel Information – ***In the 1 to 21 days prior to onset of symptoms did the case consume the following:***

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: ___/___/___ — Return date: ___/___/___

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: ___/___/___ — Return date: ___/___/___

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: ___/___/___ — Return date: ___/___/___

Exposures – ***In the 1 to 21 days prior to the onset of symptoms did the case have the following exposures:***

Animal contact: ☐ Yes ☐ No ☐ Unk — Animal: ☐ Chimpanzees ☐ Forest duikers ☐ Gorillas ☐ Monkeys

Exposed to potential infection sources: ☐ Yes ☐ No ☐ Unk — Possible VHF sources: ☐ Injected drugs ☐ Needle stick ☐ Contact with blood or other body fluids ☐ Contact with deceased person

NOTES: _____

WEST NILE VIRUS

Also Known as: WNV

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone, Infection Preventionist involvement in follow-up may vary.
Lab: Report by IDSS, facsimile, mail, or phone
Physician: Report by facsimile, mail, or phone
Local Public Health Agency (LPHA): Report by IDSS, facsimile, mail, or phone. Initiates Follow-up, works with Infection Preventionist

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

West Nile Virus is a flavivirus first found in Africa, West Asia, and the Middle East. It is closely related to St. Louis encephalitis virus, which is found in the United States. Presence of the virus was first identified in the United States in 1999. The virus can infect humans, birds, mosquitoes, horses and other mammals.

B. Clinical Description

Non-neuroinvasive disease: West Nile Fever is another type of illness that can occur in people who become infected with the virus. It is characterized by fever, headache, tiredness, aches, and sometimes rash. Although the illness can be as short as a few days, even healthy people have been sick for several weeks.

Neuroinvasive disease: Neuroinvasive disease is a severe manifestation of WNV because it affects a person's nervous system. Neuroinvasive disease includes: West Nile encephalitis (inflammation of the brain), West Nile meningitis (inflammation of the membrane around the brain and the spinal cord), and West Nile meningoencephalitis (inflammation of the brain and the membrane surrounding it). Clinical syndromes may include aseptic meningitis, myelitis, and encephalitis. Less common neurological syndromes may include cranial and peripheral neuritis/neuropathies, including Guillain-Barré syndrome. It is important to understand that neuroinvasive disease is not just limited to encephalitis and meningitis.

Symptoms
(Non-neuroinvasive disease): Most people who are infected with the West Nile virus will not have any type of illness. It is estimated that about 20% of the people who become infected will develop West Nile fever. Symptoms include fever, headache, tiredness, and body aches, and occasionally a skin rash on the trunk of the body and swollen lymph glands.

Symptoms (Neuroinvasive disease): Symptoms include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis. It is estimated that approximately 1 in 150 persons infected with the West Nile virus will develop a more severe form of disease.

C. Reservoirs

West Nile Virus is carried by birds. WNV has been identified in more than 200 species of birds found dead in the United States. The virus usually stays in birds and the mosquitoes that feed on them. Rarely, other kinds of mosquitoes that also bite people and horses pick up the viruses. Humans and horses are considered dead-end hosts, meaning they do not transmit the virus on further.

D. Modes of Transmission

WNV is spread to humans by the bite of an infected mosquito. There have been documented cases of intrauterine, transfusion-associated, and organ transplant transmission of WNV. Improvements to the sensitivities of the tests used to screen blood will reduce the risk of transmission.

E. Incubation Period

The incubation period for WNV disease is typically 2 to 6 days but ranges from 2 to 14 days and can be several weeks in immunocompromised people.

F. Period of Communicability or Infectious Period

West Nile encephalitis is NOT transmitted from person-to-person. For example, a person cannot get West Nile virus from touching or kissing a person who has the disease, or by caring for someone with the disease.

G. Epidemiology

Before the fall of 1999, WNV had not been documented in the Western Hemisphere. WNV was first isolated in the West Nile Province of Uganda in 1937. The first epidemic was in Israel during the 1950s. In 1999, human cases of WNV were identified in New York City. Iowa first identified WNV in a bird in 2001. The first human cases occurred in Iowa in 2002 and 147 human WNV cases were identified in 2003. In 2009, 9 cases were reported in Iowa, and in 2012 31 cases were reported.

Individuals who spend time outdoors, when mosquitoes are present (typically spring through fall in Iowa), are at risk of being bitten by an infected mosquito. The more time individuals spend outdoors, the greater the risk of being bitten by an infected mosquito. Individuals over 50 years of age are at an increased risk of becoming ill with severe symptoms if bitten by an infected mosquito. The seasonality of WNV transmission is variable and depends on the geographic location of exposure, the specific cycles of viral transmission, and local climatic conditions.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify locally acquired cases of WNV infection in humans to help target mosquito control measures.
- To identify cases of other arboviral infections in Iowa residents or visitors to determine whether they are imported or locally acquired.
- To identify cases of WNV infection to understand the epidemiology of this emerging disease in our area.
- To provide residents of Iowa and travelers to the state with appropriate preventive health information.

Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available, the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th St.
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) performs antibody detection for West Nile virus using enzyme immunoassay (EIA) methods. Single acute sera and cerebrospinal fluid (CSF) are tested for the presence of IgM antibodies. WNV antibodies develop soon after onset and peak around 8 days, therefore, sera and CSF collected 5-10 days post onset are ideal specimens for testing. The presence of IgM antibody usually indicates recent infection by this virus; however, it has been shown that IgM antibodies to WNV may persist for many months after onset. IgG testing is not routinely done. Confirmatory testing, if indicated, is performed at the CDC. Accurate information about date of specimen collection, date of onset of symptoms, travel history, vaccination and disease history are helpful for test result interpretation. For information on specimen submission and testing, contact SHL at (319) 335-4500. Additional information, test request forms, and sample collection instructions can be found at the SHL web site at: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. The local public health agency (LPHA) should follow-up on reported cases of WNV.
b. Neuroinvasive disease includes diagnoses of West Nile encephalitis, West Nile meningitis or West Nile meningoencephalitis, neuritis/neuropathies, or myelitis. The severe WNV illnesses typically require hospitalization. The LPHA should work with the infection preventionist (IP) at the hospital to complete the WNV case investigation in IDSS.
c. Non-neuroinvasive disease includes WNV Fever and any other diagnoses of WNV including symptoms consistent with the illness and/or clinically apparent disease not involving encephalitis, meningitis or meningoencephalitis (neurological involvement). LPHA will complete the investigation for WNV.
d. Asymptomatic test positives include individuals who have been infected with and tested positive for WNV without becoming ill (remaining asymptomatic or without clinically apparent disease). Please note in IDSS if this is the situation.
e. If several attempts have been made to obtain case information, but have been unsuccessful (e.g., the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), complete the investigation with as much information as has been gathered. Please note the reason why it could not be completed. If using IDSS, select the appropriate reason under the Event tab in the Event Exception field.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None

B. Protection of Contacts of a Case

None

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If an outbreak is suspected, contact IDPH/CADE at (800) 362-2736. The situation may warrant an investigation of clustered cases or implementation of effective prevention and control measures (*e.g.,* spraying for mosquitoes). CADE can assist in determining a course of action to prevent further cases and can perform surveillance for cases across county lines that can be difficult to identify at a local level.

D. Preventive Measures

Surveillance

In Iowa, CADE, Iowa State University, the State Hygienic Laboratory, and the Iowa Department of Agriculture and Land Stewardship conduct surveillance for arboviral diseases including West Nile virus, through mosquito trapping and testing, sentinel chicken testing, dead bird collection and testing, and through the monitoring of human and equine cases. Results of these surveillance efforts are used to detect the presence of the virus to help target prevention and control measures throughout the state.

CADE, in cooperation with other state agencies, may provide guidance in the use of pesticides for the control of mosquitoes (e.g., "mosquito fogging"). However, decisions regarding the use of larvicides and/or adulticides for mosquito control are typically made by local cities and towns based on mosquito habitat and density, primarily for control of nuisance mosquitoes.

Personal Preventive Measures/Education

The easiest and best way to avoid WNV is to prevent mosquito bites. When outdoors, use insect repellents containing DEET (N, N-diethyl-meta-toluamide) and follow the directions on the package. DEET is the most effective insect repellent available. Repellants containing picaridin and oil of lemon eucalyptus have also been found to be effective.

A higher percentage of DEET in a repellent does not provide better protection, just longer protection. DEET concentrations higher than 50% do not increase the length of protection. The recommended concentration of DEET for adults is 30% and 10% for children and infants over 2 months of age. According to the label, oil of lemon eucalyptus products should NOT be used on children under 3 years. Use repellents at the lowest effective concentration. Wash treated skin with soap and water after returning indoors. Wear long-sleeved shirts, long pants, and socks when possible. Spray clothing with products containing DEET or permethrin, as mosquitoes may bite through thin clothing. Permethrin should only be used on clothing; do not apply it directly to skin. Wash treated clothing before wearing it again. Many mosquitoes are most active at dusk and dawn; consider staying indoors during these hours.

Environmental Preventive Measures

Make sure to have good screens on windows and doors to keep mosquitoes out. Get rid of mosquito breeding sites by eliminating old tires and tin cans, as well as emptying standing water from flowerpots, buckets, barrels and children's wading pools when not in use. Change the water in pet dishes and replace the water in birdbaths weekly. Drill holes in tire swings so water drains out.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for West Nile Virus can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Comment

Interpreting arboviral laboratory results

- **Serologic cross-reactivity.** In some instances, arboviruses from the same genus produce cross-reactive antibodies. In geographic areas where two or more closely-related arboviruses occur, serologic testing for more than one virus may be needed and results compared to determine the specific causative virus. For example, such testing might be needed to distinguish antibodies resulting from infections within genera, e.g., flaviviruses such as West Nile, St. Louis encephalitis, Powassan, Dengue, or Japanese encephalitis viruses.
- **Rise and fall of IgM antibodies.** For most arboviral infections, IgM antibodies are generally first detectable at 3 to 8 days after onset of illness and persist for 30 to 90 days, but longer persistence has been documented (e.g, up to 500 days for West Nile virus). Serum collected within 8 days of illness onset may not have detectable IgM and testing should be repeated on a convalescent-phase sample to rule out arboviral infection in those with a compatible clinical syndrome.
- **Persistence of IgM antibodies.** Arboviral IgM antibodies may be detected in some patients months or years after their acute infection. Therefore, the presence of these virus-specific IgM antibodies may signify a past infection and be unrelated to the current acute illness. Finding virus-specific IgM antibodies in CSF or a fourfold or greater change in virus-specific antibody titers between acute- and convalescent-phase serum specimens provides additional laboratory evidence that the arbovirus was the likely cause of the patient's recent illness. Clinical and epidemiologic history also should be carefully considered.
- **Persistence of IgG and neutralizing antibodies.** Arboviral IgG and neutralizing antibodies can persist for many years following a symptomatic or asymptomatic infection. Therefore, the presence of these antibodies alone is only evidence of previous infection and clinically compatible cases with the presence of IgG, but not IgM, should be evaluated for other etiologic agents.
- **Arboviral serologic assays.** Assays for the detection of IgM and IgG antibodies commonly include enzyme-linked immunosorbent assay (ELISA), microsphere immunoassay (MIA), or immunofluorescence assay (IFA). These assays provide a presumptive diagnosis and should have confirmatory testing performed. Confirmatory testing involves the detection of arboviral-specific neutralizing antibodies utilizing assays such as plaque reduction neutralization test (PRNT).
- **Other information to consider.** Vaccination history, detailed travel history, date of onset of symptoms, and knowledge of potentially cross-reactive arboviruses known to circulate in the geographic area should be considered when interpreting results.

References

American Academy of Pediatrics. *1997 Red Book: Report of the Committee on Infectious Diseases, 24th Edition*. Illinois, American Academy of Pediatrics, 1997.

CDC Website. West Nile Virus. Available at www.cdc.gov/ncidod/dvbid/westnile/index.htm

Evans, A. *Viral Infections of Humans: Epidemiology and Control, Second Edition*. New York City, Plenum Medical Book Company, 1984.

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.
Moellering, R. *Infectious Disease Clinics of North America: Animal- Associated Human Infections*. Philadelphia, W.B. Saunders Co., 1991.

Additional Resources

Additional information regarding WNV, pesticide use, occupational exposures and other topics may be obtained using the following websites:
Environmental Protection Agency www.epa.gov/pesticides/health/mosquitoes/.
U.S. Department of Labor/OSHA www.osha.gov/dts/shib/shib082903b.html

West Nile Virus

Investigator:

Agency:

Phone number:

FOR STATE USE ONLY

Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case

Reviewer initials:

Referred to another state:

CASE

Last name:

First and middle name:

Maiden name: Suffix:

Address line:

Zip: City:

State: County:

Phone: ( )- - Type:

Long-term care resident: ☐ Yes ☐ No ☐ Unknown

Facility name:

Date of Birth: / / Estimated? ☐ Age:

Gender: ☐ Female ☐ Male ☐ Other

Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed

Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Parent/Guardian name:

Parent/Guardian phone: ( )- - Type:

EVENT

Diagnosis date: / / Onset date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown

Date of death / /

Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name:

Exposure setting:

Epi-linked: ☐ Yes ☐ No ☐ Unknown

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: Country:

Healthcare provider information

Last name:

First name:

Provider title: ☐ ARNP ☐ MD ☐ DO ☐ NP ☐ PA

Facility name:

Address line 1:

Address line 2:

Zip code: City:

State: County:

Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory:

Accession #:

Collection date: / /

Date received: / /

Specimen source:

Result date: / /

Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG

Organism: **West Nile virus**

Test type: ☐ Serology (EIA/ELISA/MIA) ☐ Serology (IFA) ☐ PRNT ☐ PCR ☐ Other

Result type: ☐ Preliminary ☐ Final

Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate

Laboratory:

Accession #:

Collection date: / /

Date received: / /

Specimen source:

Result date: / /

Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG

Organism: **West Nile virus**

Test type: ☐ Serology (EIA/ELISA/MIA) ☐ Serology (IFA) ☐ PRNT ☐ PCR ☐ Other

Result type: ☐ Preliminary ☐ Final

Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate

Laboratory: _____ Specimen source: _____ Test type: ☐ Serology (EIA/ELISA/MIA) ☐ Serology (IFA) ☐ PRNT ☐ PCR ☐ Other _____

Accession #: _____ Result date: / / Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result type: ☐ Preliminary ☐ Final

Collection date: / / Date received: / / Organism: **West Nile virus** Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: _____ Job title: _____

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name: _____

Date worked from: / / Address: _____

Date worked to: / / Zip code: _____

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: _____ State: _____ County: _____

Date removed: / / Phone: ( )- - Type: _____

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties in lab or health care setting: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: _____ Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Admission date: / / Discharge date: / / Days hospitalized: _____

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Physician diagnosis:
☐ Encephalitis
☐ Meningitis
☐ Meningoencephalitis
☐ Fever
☐ Asymptomatic
☐ Hepatitis/jaundice
☐ Multi-system organ failure
☐ Other _____

Clinical classification:
☐ Neuroinvasive
☐ Non-neuroinvasive

Symptoms:
☐ Acute flaccid paralysis
☐ Altered mental state
☐ Anorexia
☐ Coma
☐ Confusion
☐ Cranial nerve palsies
☐ Diarrhea
☐ Double vision
☐ Eye pain
☐ Fatigue
☐ Fever
☐ Gait/balance difficulty
☐ Headache
☐ Joint pain
☐ Muscle pain
☐ Nausea
☐ Photophobia
☐ Rash
☐ Stiff neck
☐ Swollen lymph nodes
☐ Tremors
☐ Vertigo
☐ Vomiting
☐ Other symptoms: _____

Pre-existing Conditions

Before your West Nile virus (WNV) infection, did a health care provider ever tell he/she had any of the following medical conditions?

☐ Diabetes
☐ High blood pressure (hypertension)
☐ Heart attack (myocardial infarction)
☐ Angina or coronary artery disease
☐ Congestive heart failure
☐ Stroke
☐ Chronic obstructive pulmonary disease (COPD)
☐ Chronic liver disease
☐ Kidney disease or failure
☐ Bone marrow transplant
☐ Alcoholism
☐ Case had none of the conditions listed

Before WNV infection, did the case ever have a solid organ transplant? ☐ Yes ☐ No ☐ Unk

If yes, what organ was transplanted: _____

If yes, what year was the transplant: _____

Before WNV infection, has the case ever had cancer? ☐ Yes ☐ No ☐ Unk

If yes, what cancer type(s): _____

If yes, what year were you diagnosed: _____

If yes, are you currently being treated for cancer: ☐ Yes ☐ No ☐ Unk

Before WNV infection, did the case have any medical condition that limited his/her ability to fight infection? ☐ Yes ☐ No ☐ Unk

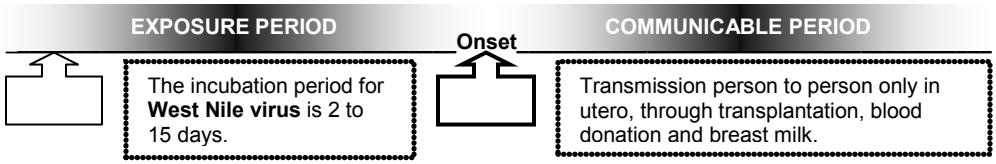
If yes, what condition: _____

At the time WNV infection was diagnosed, was the case taking any of the following types of prescription medications or treatments?

☐ Chemotherapy
☐ Other treatments for cancer
☐ Hemodialysis
☐ Other treatments for kidney disease
☐ Oral or injected steroids
☐ Inhaled steroids
☐ Insulin or other medications to treat diabetes
☐ Medications to treat high blood pressure
☐ Medications to treat coronary artery disease
☐ Medications to treat congestive heart failure
☐ Medications that suppress the immune system
☐ Case was not on any medications/treatments listed

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.



RISK FACTORS/TRAVEL

Ever vaccinated for Yellow fever ☐ Yes ☐ No ☐ Unk

Ever vaccinated for Japanese encephalitis (JE)? ☐ Yes ☐ No ☐ Unk

If yes, list MOST RECENT vaccination information ONLY:

Disease: Yellow fever
Date vaccinated: ___/___/___
Lot #: _____
Vaccine type: _____
Manufacturer: _____

Disease: Japanese encephalitis (JE)
Date vaccinated: ___/___/___
Lot #: _____
Vaccine type: _____
Manufacturer: _____

Risk Factors/Travel Information

In the 2 to 15 days prior to onset of symptoms did the case:

Traveled within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: ___/___/___ — Return date: ___/___/___

Traveled within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: ___/___/___ — Return date: ___/___/___

Traveled outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: ___/___/___ — Return date: ___/___/___

Exposed to mosquitoes: ☐ Yes ☐ No ☐ Unk

Use a mosquito repellent: ☐ Yes ☐ No ☐ Unk — If yes, how often? ☐ Always ☐ Most of the time ☐ sometimes ☐ Never — If yes, what type? ☐ DEET ☐ Lemon eucalyptus oil ☐ Picaridin ☐ Other _____

If the patient is female, was she:

Breastfeeding? ☐ Yes ☐ No ☐ Unk

In the 30 days prior to onset of symptoms did the case:

Donate blood, blood products, organs or tissues? ☐ Yes ☐ No ☐ Unk — Date donated: ___/___/___

Receive blood or blood products? ☐ Yes ☐ No ☐ Unk — Date received: ___/___/___

Receive organs or tissue? ☐ Yes ☐ No ☐ Unk — Date received: ___/___/___

Case acquired infection:
☐ Naturally
☐ Transplantation
☐ Transfusion
☐ Trans-placental
☐ Breastfeeding
☐ Occupationally
☐ Unknown

FACT SHEET WEST NILE VIRUS

What is West Nile virus?
West Nile virus is a mosquito-borne virus that is commonly found in Africa, West Asia, and the Middle East. It is closely related to St. Louis encephalitis virus found in the United States. While the virus mainly infects mosquitoes and birds, mosquitoes can transmit the virus to people and other animals. The virus was first identified in the West Nile district of Uganda in 1937. It was first reported in the United States in 1999, when 62 cases and 7 deaths in humans from West Nile virus infection were reported in the New York City area.

Should the West Nile virus be a concern for people in Iowa?
Yes. Since 1999, West Nile has spread across the continental United States. The virus was identified in a dead crow in the eastern part of Iowa in September 2001. Human cases in Iowa have been reported every year since 2002.

How is West Nile virus spread?
Mosquitoes can get West Nile virus when feeding on infected birds. Mosquitoes can then spread the virus to people through a bite. West Nile virus cannot be spread by person-to-person contact such as kissing, touching, or caring for an infected person. West Nile virus can also rarely be transmitted to humans who receive infected organs by transplantation or who receive transfusions of infected blood or blood products.

Is a person that is bitten by a mosquito in an area known to have West Nile virus likely to get infected?
No. The chance of getting infected with the virus is low. Even in areas where the virus is circulating, very few mosquitoes are infected with the virus and not all mosquitoes can successfully transmit the virus. Most people who become infected with West Nile virus following a mosquito bite do not develop any symptoms.

What are the symptoms of West Nile virus?
Most people who are infected with West Nile virus either have no symptoms or experience mild illness such as fever, headache, and body aches before fully recovering. Some persons may develop a skin rash and swollen lymph glands. In <1% of infections, particularly in those persons over age 50, West Nile virus can cause serious disease, such as encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord). These conditions may result in permanent brain damage, or on rare occasions, can be fatal. Symptoms of severe disease can include severe headache, high fever, stiff neck, confusion, loss of consciousness, tremors, muscle weakness, and paralysis.

How is an infection with West Nile virus diagnosed and treated?
A healthcare provider can diagnose West Nile virus through special tests. There is no vaccine or specific treatment, though a physician may prescribe medications to reduce symptoms. In severe cases, hospitalization may be required. Persons who have been exposed (i.e. bit by a mosquito), but have not developed symptoms do not need to be tested. Your healthcare provider should be contacted if you develop severe symptoms.

How can an infection with West Nile virus be prevented?
Protect yourself from mosquito bites and eliminate mosquito breeding sites:

- Insect repellents containing DEET, permethrin, picaridin, IR3535, or oil of lemon eucalyptus have shown to be effective against mosquitoes. Permethrin repellants should be applied to clothing only and should not be used on the skin. Products containing up to 30% DEET have been shown to be the most effective and are safe for adults, including pregnant women and children over 2 months of age. DEET should be applied sparingly only to exposed skin and should not be used underneath clothing.
- Repellent products must state any age restriction. If there is none, EPA has not required a restriction on the use of the product. The American Academy of Pediatrics has recommends that repellents with

DEET should not be used on infants less than 2 months old. According to the label, oil of lemon eucalyptus products should NOT be used on children under 3 years.

- Wear light colored, long-sleeved shirts and long pants whenever you are outdoors for long periods of time or when mosquitoes are most active.
- Make sure doors and windows have tight fitting screens. Repair or replace screens that have holes or tears.
- Eliminating mosquito-breeding sites (they breed by laying eggs in standing water) by removing sources of standing water in outdoor areas where you work or play. Specific activities include the following:
    - Turning over or removing items where rainwater can collect, such as ceramic pots, toys, buckets, tires, wading pools, and tarps covering firewood and boats;
    - Changing water in birdbaths and pet bowls every 3-4 days;
    - Making sure roof gutters are clean and in good repair;
    - Repairing leaky outdoor faucets, air conditioners, and hoses; and
    - Stocking ornamental ponds with mosquito dunks or fish that eat mosquito larvae.

Is donating blood or getting blood transfusions or organ transplants safe?

Donating blood is safe and individuals are still encouraged to donate. However, those individuals who present with symptoms of West Nile, or who are experiencing any kind of illness, will not be allowed to donate blood. Blood centers are taking precautions to be sure that donors who have been diagnosed with West Nile have fully recovered before being allowed to donate. People who have been diagnosed with West Nile virus should not be allowed to donate blood for 120 days from the start of their symptoms or their laboratory diagnosis, whichever is later. All blood banks are screening for West Nile virus and will dispose of positive blood. Persons who develop symptoms of West Nile virus infection within four weeks of receiving a blood transfusion or organ transplantation or whose symptoms begin in the weeks following the blood or organ donation are advised to contact their healthcare provider.

Can a West Nile infected pregnant woman infect her unborn child?

There have been reports of mother-to-fetus transmission of West Nile virus in humans. Pregnant women should take precautions to reduce their risk for West Nile virus and other arboviral infections by avoiding mosquitoes, wearing protective clothing and using repellents containing DEET. It is not recommended that pregnant women or newborns be screened for West Nile.

What should I do if I find a dead bird?

Finding a dead bird near your home does not necessarily put you at increased risk for West Nile virus. West Nile virus infection is not likely to be transmitted by direct contact with dead birds. Dead birds, however, can carry a variety of diseases, and should never be handled with bare hands. Use gloves to carefully place dead birds in double-plastic bags and then place in the outdoor trash or bury.

Can animals be infected with West Nile virus?

Animals become infected the same way that humans become infected – through the bite of an infected mosquito. Horses can experience severe and fatal disease like humans, and cats and dogs can also become infected, but rarely develop disease. Animals infected with West Nile virus do not spread the disease to humans. Contact your veterinarian to arrange for vaccination of your horses or if you suspect your pet or animal might have been infected with West Nile virus.

Where can additional information regarding WNV be found?

- Iowa Department of Public Health at www.idph.state.ia.us
- State Hygienic Laboratory (SHL) www.uhl.uiowa.edu
- Centers for Disease Control and Prevention www.cdc.gov/
- Iowa State University's Department of Entomology www.ent.iastate.edu/

FACT SHEET WEST NILE VIRUS

For Health Professionals

What is West Nile Virus?
West Nile Virus (WNV) is an arbovirus (a virus carried by arthropods) that was first identified in the West Nile region of Uganda in 1937. It belongs to the family of viruses termed Flaviviridae and it is similar to other arboviruses such as St. Louis encephalitis virus and Yellow Fever virus. The virus first appeared in the United States in 1999 in the New York City area. Human cases in Iowa have been reported every year since 2002, suggesting the disease has become endemic here.

How is the virus transmitted?
The principal transmission cycle of WNV involves several species of mosquitoes and birds. Humans are incidental hosts that acquire the WNV infection primarily by the bite of an infected mosquito. However, several atypical modes of WNV transmission have been described: organ transplant, receipt of blood products, breastfeeding and intrauterine transmission. These modes of transmission are expected to occur infrequently. There is no evidence that WNV can be spread by person-to-person contact.

What are the signs and symptoms of WNV?
Approximately 80% of persons bitten by an infected mosquito will develop no symptoms at all. A mild disease, termed "West Nile fever, occurs in 20% of those infected and is characterized as a febrile illness of sudden onset. Less than one percent of those infected will develop a severe neurological form of the disease (West Nile encephalitis, meningitis). Poliomyelitis, a flaccid paralysis syndrome associated with WNV infection, is less common than meningitis or encephalitis. This syndrome is generally characterized by the acute onset of asymmetric limb weakness or paralysis in the absence of sensory loss is easily confused with Guillain-Barré syndrome. Pain sometimes precedes the paralysis. The paralysis can occur in the absence of fever, headache, or other common symptoms associated with WNV infection. Involvement of respiratory muscles, leading to acute respiratory failure, can sometimes occur.

Clinical Features of Mild Infection: Fever, headache, fatigue, skin rash on the trunk of the body, swollen lymph glands, eye pain, anorexia, or vomiting.

Clinical Features of Severe Infection: Fever, gastrointestinal symptoms, weakness, change in mental status, or a maculopapular or morbilliform rash involving the neck, trunk, arms, or legs.
Neurological presentations include:

- Ataxia and extrapyramidal signs
- Seizures
- Polyradiculitis
- Optic neuritis
- Myelitis
- Flaccid paralysis is sometimes seen.
- Although not observed in recent outbreaks, myocarditis, pancreatitis, and fulminant hepatitis have been described.

What is the incubation period and how long do symptoms last?
The incubation period for WNV infection is about 2 to 14 days, although longer incubation periods have been documented in immunosuppressed persons. Symptoms of mild disease usually last 3 to 6 days, however, WNV sequela may include mild weakness and memory loss lasting several weeks, and the CDC reports neurological effects may be permanent in those who had the severe form of the disease.

Who is at high risk for acquiring WNV?
Persons over the age of 50 appear to be at greatest risk for a WNV infection progressing to the more serious encephalitis/meningitis, although WNV can infect persons of all ages.

How is WNV diagnosed?

- The most efficient diagnostic method is detection of IgM antibody to WNV in serum collected within 8 to 14 days of illness onset or CSF collected within 8 days of illness onset using an enzyme immunosorbent assay (EIA).

- IgM antibody does not cross the blood-brain barrier; IgM antibody in CSF strongly suggests central nervous system infection.
- WNV-specific IgM has persisted in patients for >500 days. Positive serologic tests must be correlated with clinical presentation, season and potential exposure to WNV.
- A positive IgG antibody test from a single sample is **not** diagnostic for acute infection. IgG may be present in blood for reasons not related to a recent WNV infection, such as yellow fever vaccination, infection with a virus related to WNV, or evidence of a past exposure to a related virus. The test is less specific, i.e. may produce false-positive results.
- Serological tests for WNV can cross react with other closely related flaviviruses (Japanese encephalitis, St. Louis encephalitis, yellow fever, dengue). Patients who have been recently vaccinated against or recently infected with related flaviviruses may have positive WNV results.

Is a convalescent specimen necessary?

Collection of a convalescent specimen at least 2 weeks post onset should be considered on patients with clinical symptoms consistent with WNV infection where the acute sample was collected less than 8 days post symptom onset and tested negative for IgM antibody; or where the acute specimen yielded an equivocal or indeterminate result.

What are the indications for testing for WNV?

- Clinically compatible illness during transmission season. In Iowa, transmission is likely to occur from June through October, with peak activity in August to mid-September.
- Providers should consider if there is any clinical value in testing patients with mild fevers of unknown origin in the absence of neurological signs.
- Encephalitis cases of unknown etiology.
- Aseptic meningitis cases, although at this time of year, such cases may be caused by enteroviruses; CSF testing by PCR for enterovirus is recommended.
- Patients with flaccid paralysis or neurological symptoms following a febrile illness.
- Pregnant or breast-feeding women with a compatible febrile illness and exposure history.
- Patients with onset of compatible illness within 2 weeks of receiving blood products or having donated blood.

How is WNV treated?

No specific treatment for WNV is currently available and there are no vaccines for human use. Treatment for mild illness is usually not necessary. In severe cases, treatment consists of supportive care that often involves hospitalization, intravenous fluids, respiratory support, and prevention of secondary infections.

What specimens need to be submitted to test for WNV?

- WNV testing for patients with encephalitis or meningitis can be obtained at the State Hygienic Laboratory (SHL). Acute serum is best collected at 8 days following symptom onset and convalescent serum from 14 - 21 days following symptom onset. Specimens must be submitted with the current SHL version request form (SHL website at www.uhl.uiowa.edu or (319) 335-4500 for request forms and shipping instructions).
- For mild illness (West Nile fever), WNV testing is available at most commercial laboratories. Please contact your clinical laboratory for information.

How should a case of WNV be reported?

Please contact the Iowa Department of Public Health at (800) 362-2736 to report a case.

Where can additional information regarding WNV be found?

- The Iowa Department of Public Health, Center for Acute Disease Epidemiology at (800) 362-2736 or www.idph.state.ia.us
- State Hygienic Laboratory (SHL): www.uhl.uiowa.edu
- Iowa State University's Department of Entomology: www.ent.iastate.edu/
- Centers for Disease Control and Prevention: www.cdc.gov

FACT SHEET
For Senior Citizens

WEST NILE VIRUS

What is West Nile Virus?
West Nile virus is a mosquito-borne virus that is commonly found in parts of Africa, West Asia, and the Middle East and in 1999 it was identified in the United States. Since 1999, West Nile has spread across the United States infecting humans, birds, horses and other animals. In 2003, Iowa reported 147 infected residents including six deaths. West Nile virus is spread to humans, birds, and other animals through the bite of an infected mosquito.

Why should senior citizens be concerned about West Nile?
Persons over the age of 50 are at increased risk of developing the severe form of West Nile.
Very few mosquitoes are infected with the West Nile virus and most persons who are bit by an infected mosquito will never develop illness. Some persons will develop a mild illness with symptoms of headache and/or slight fever, and <1% of those persons bit by an infected mosquito will develop the severe form of West Nile virus. Severe infections, including encephalitis (inflammation of the brain), are characterized by high fever, headache, confusion, muscle aches and weakness, seizures, and paralysis. You should contact your healthcare provider if you develop severe symptoms. It is not necessary to contact your physician if you have been bit by a mosquito and have no symptoms.

Senior citizens can prevent West Nile by avoiding mosquito bites:

- Limit outdoor activities during prime mosquito hours of dawn and dusk.
- Shoes, socks, long pants, and a long-sleeved shirt should be worn when outdoors for long periods of time or when mosquitoes are most active. Clothing should be light colored and made of woven material. Shirts should be tucked in with the collar buttoned.
- Use an insect repellent containing DEET. Concentrations of up to 30% DEET is safe for adults; reapply as necessary. Follow all label instructions for application use.
- Use mosquito netting when sleeping outdoors or in unscreened structures.
- Repair holes in screens and make sure both screens and doors are tight fitting.

Senior citizens can prevent West Nile by eliminating mosquito breeding sites:

- Eliminate areas of standing water on your property where mosquitoes can breed.
- Turn over or remove items in your yard where rainwater can collect, such as ceramic pots, toys, buckets, tin cans, wheelbarrows, wading pools, plastic containers, and tarps covering firewood.
- Make sure roof gutters are clean and in good repair.
- Change water in birdbaths and pet bowls every 3-4 days.
- Repair leaky outdoor faucets, air conditioners, and hoses.
- Do not over water lawns, shrubs, or flowers.
- Stock ornamental ponds and water gardens with mosquito dunks or fish that eat mosquito larvae.
- Keep grass cut short and shrubbery trimmed.
- Dispose of old tires or drill drainage holes in tires used in landscaping.
- Keep trashcans covered.

For more information on West Nile virus visit: www.idph.state.ia.us

FACT SHEET DEET (N,N-diethyl-m-toluamide)

What is DEET?
DEET, also known as N,N-diethyl-m-toluamide or N,N-diethly-3-methylbenamide, is the active chemical ingredient in most insect repellents applied to the skin. It has been tested against a variety of biting insects and has been proven to be an effective insect repellent for mosquitoes, ticks, black flies, fleas, and no-see-ums. Both the World Health Organization and Centers for Disease Control and Prevention recommend the use of DEET-based repellents to protect against insect-borne diseases such as West Nile virus.

SAFE and EFFECTIVE USE of DEET
DEET is safe when used according to label directions. DEET was developed by the U.S. Army in 1946 for use by military personnel in insect-infested areas and was first registered in the United States in 1957. However a few incidents of toxic reactions to DEET have occurred even when the product was used properly.

The length of time that an insect repellent will provide protection from mosquito bites depends on the concentration of DEET in the product. A higher percentage of DEET in a repellent does not provide better protection, just longer protection. It has been proven that products with a DEET concentration over 50% do not increase the length of protection. A higher percentage of DEET should be used if you are outdoors for a long period of time and a lower percentage of DEET should be used if you are outdoors for a short period of time.

Products containing up to 30% DEET have been found to be safe for adults. No definitive studies exist in the scientific literature about what concentration of DEET is safe for children. The American Academy of Pediatrics states that insect repellents containing DEET with a concentration of 30% appear to be as safe as products with a concentration of 10% when used according to the directions on the product label. DEET is not recommended for use on children under 2 months of age; most experts agree it is safe to apply insect repellent with low concentrations of DEET to children over 2 months of age. The safest approach for infants and children under 2 years is to minimize exposure to mosquitoes.

The Environmental Protection Agency and the Centers for Disease Control and Prevention recommend the following guidelines for using insect repellents containing DEET:

- ✓ **Read and carefully follow product label directions and precautions.**
- ✓ **Apply repellent sparingly on exposed skin and/or clothing.**
- ✓ **Do not apply DEET underneath clothing.**
- ✓ **Do not apply repellent near eyes, lips, or mouth.**
- ✓ **Never apply DEET over cuts, wounds, or irritated skin.**
- ✓ **Avoid using sprays in enclosed areas. Do not use DEET near food.**
- ✓ **Do not apply repellent to the hands of young children.**
- ✓ **Do not allow young children to apply repellents themselves.**
- ✓ **After returning indoors, wash treated skin with soap and warm water.**
- ✓ **Avoid over application. Heavy application is not necessary to achieve protection.**
- ✓ **Wash treated clothing before wearing again.**

FACT SHEET Mosquito Repellents

Avoid mosquito bites by:

- Applying approved insect repellents (listed below).
- Wearing protective clothing, such as long sleeves, long pants, socks and shoes.
- Being aware of peak hours of mosquito activity: dusk and dawn.

CDC Approved/EPA Registered Mosquito Repellents:

1. **DEET**
    - The American Academy of Pediatrics recommends that repellents with DEET should not be used on infants less than 2 months old.
    - Repellents that contain up to 30 percent DEET are safe for children.
    - Refer to the IDPH DEET fact sheet for more information.
2. **Picaridin**
3. **Oil of Lemon Eucalyptus or PMD**
    - Should not to be used on children under the age of three years.
4. **IR3535**
5. **Permethrin**
    - Only recommended for use on clothing, shoes, bed nets, and camping gear. Permethrin should not be applied directly on skin.

Mosquito proof your home by:

- Emptying water from flower pots, pet food and water dishes, birdbaths, swimming pool covers, buckets, barrels, and cans. This should be done at least once or twice weekly.
- Checking for clogged rain gutters and cleaning them out.
- Removing discarded tires and other items that could collect water.
- Checking for containers or trash in places that may be hard to see, such as under bushes or under your home.

How often should mosquito repellent be applied?

The label directions on the repellent should always be followed. Length of protection against mosquito bites varies with the amount of the active ingredient, environmental factors such as temperature and humidity, amount of physical activity/perspiration, water exposure, and other factors.

What precautions should be followed when using insect repellents?

- Read and carefully follow product label directions and precautions.
- Apply repellent sparingly on exposed skin and/or clothing.
- Do not apply repellent near eyes, lips, or mouth.
- Never apply repellents over cuts, wounds, or irritated skin.
- Avoid using sprays in enclosed areas.
- Do not use repellents near food.
- Do not apply repellent to the hands of young children.
- Do not allow young children to apply repellent to themselves.
- After returning indoors, wash treated skin with soap and warm water.
- Avoid over application. Heavy application is not necessary to achieve protection.
- Wash treated clothing before wearing again.

Can mosquito repellents be used with sunscreen?

Yes. People can, and should, use both a sunscreen and an insect repellent when they are outdoors. Follow the instructions on the package for proper application of each product. In general, the recommendation is to apply sunscreen first, followed by repellent.


Diseases X-Y-Z

YELLOW FEVER

Report Immediately By Phone

Responsibilities:
Hospital: Report immediately by phone
Lab: Report immediately by phone
Physician: Report immediately by phone
Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Yellow fever is a mosquito-borne viral illness. It is caused by the yellow fever virus, which is in the genus *Flavivirus* and family *Flaviviridae*.

B. Clinical Description

Many cases of yellow fever are so mild they go undetected. Yellow fever is only known to occur in Africa and South and Central America.

Symptoms: In typical cases of recognized illness, sudden onset of fever, chills, headache, backache, generalized muscle pain, prostration, nausea and vomiting, jaundice, and albuminuria (the presence of protein in the urine) may occur. Most infections resolve at this stage.

Complications: In more severe cases of illness, after a brief remission of hours to a day, there is progression to liver and kidney failure and to hemorrhagic symptoms, including nosebleeds, bleeding gums, bloody vomiting and bloody stools. Twenty to 50% of severe cases with jaundice are fatal. The overall case-fatality rate is 20-50 percent. Lifetime immunity follows yellow fever recovery.

C. Reservoirs

Monkeys are the primary reservoirs in forested areas of Africa and South America. Humans and *Aedes aegypti* mosquitoes are involved in the infective cycle in urban areas.

D. Modes of Transmission

Yellow fever has two different transmission cycles that affect humans, the urban cycle and the jungle cycle.

Urban cycle: The virus is transmitted among humans by the bite of an infective house-dwelling *Aedes aegypti* mosquito. Monkeys play little or no role as a reservoir.

Jungle cycle: Several species of mosquitoes are vectors and transmit virus from monkey to monkey. Humans are involved in the jungle cycle accidentally if bitten by infected mosquitoes. In South America, sporadic infection of humans occurs almost exclusively in forestry and agricultural workers through occupational exposure, however outbreaks can and do occur. Direct person-to-person spread of yellow fever does not occur.

E. Incubation Period

The incubation period for yellow fever is 3 - 6 days.

F. Period of Communicability or Infectious Period

Yellow fever is not transmitted from person-to-person. The blood of patients is infective for mosquitoes from shortly before onset of fever until 3 - 5 days of illness. The incubation period in *Aedes aegypti* mosquitoes is commonly 9 - 12 days at the usual tropical temperatures. Once infected, mosquitoes remain so for life.

G. Epidemiology

Yellow fever is now endemic only to certain regions of South and Central America and Africa. Any cases in Iowa are likely due to recent travel abroad.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify imported cases of yellow fever to understand the global epidemiology of endemic and epidemic yellow fever.
- To ensure that cases are appropriately contained to prevent the introduction of virus into native mosquito populations.
- To identify locally acquired cases, if they occur, so appropriate active surveillance and mosquito control interventions can be taken.
- To identify cases that may be part of a larger, worldwide outbreak.
- To provide travelers with appropriate preventive health information.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report immediately. The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698.

Laboratory Testing Services Available

Laboratory testing for yellow fever is not available at the University of Iowa State Hygienic Laboratory (SHL). However, the SHL serology laboratory will forward specimens to the Centers for Disease Control and Prevention (CDC) for yellow fever testing. CDC requests that physicians submit complete case history information with the specimens. For additional information on submitting samples, contact SHL Serology at 319-335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. Case investigation of yellow fever in Iowa residents will be directed by IDPH Center for Acute Disease Epidemiology (CADE).

b. Following notification of IDPH, the LPHA(s) may be asked to assist in an investigation of a case of yellow fever by interviewing the case and others who may be able to provide pertinent information. Most of the information required can be obtained from the medical provider or the medical record. Use the following guidelines to assist in conducting an investigation:
   1) Confirm the diagnosis of Yellow Fever with the case's healthcare provider and request a copy of all laboratory tests used to diagnose the illness.
   2) Record the case's demographic information.
   3) Record the date of symptom onset, symptoms, date of diagnosis, hospitalization information (if applicable), and outcome of disease (*e.g.,* recovered, died).
   4) Exposure history: use the approximate incubation period range for yellow fever (3–6 days). Specifically, focus on the period beginning 3 days prior to the onset date back to approximately 6 days before onset for travel history: determine the date(s) and geographic area(s) traveled to by the case.

5) If there is NO history of travel outside of the United States within 6 days prior to illness onset notify IDPH immediately and begin active surveillance for additional cases where the individual may have traveled, their home and work.
6) Include information about the case's yellow fever vaccination status, including the date most recently vaccinated.
7) If several attempts to obtain case information have been made, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please gather as much information as possible, notify CADE and enter as much information as is possible through the Iowa Disease Surveillance System (IDSS).

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

None.

B. Protection of Contacts of a Case

It is important to prevent mosquitoes from biting a case for at least 5 days after onset of illness. Mosquito control can be done by screening sickrooms, spraying with insecticides and using bed nets. These measures can prevent transmission of yellow fever from infected mosquitoes to contacts of a case. Concerns over local transmission should be small.

C. Managing Special Situations

Locally Acquired Case

As noted above in Section C 4), a locally acquired case of yellow fever would be an unusual occurrence. Contact the Iowa Department of Public Health immediately at (800) 362-2736 and request assistance if the case is believed to be acquired locally. Environmental measures such as investigating local areas visited by the case to locate the focus of infection and surveillance of other people for illness may be necessary.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common exposure to or association with *A. aegypti* mosquitoes (*e.g.,* travelers returning from endemic countries) should be sought and applicable preventive or control measures should be instituted. Contact IDPH using the disease reporting hotline (800) 362-2736 as soon as possible. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several town lines and therefore be difficult to identify at a local level.

D. Preventive Measures

International Travel and Vaccination

- A live vaccine is recommended for everyone over 9 months old who will be living in or traveling to endemic areas, and required by international regulations for travel to and from certain countries. Pregnant women should not be vaccinated except when travel to an endemic area is unavoidable and if an increased risk for exposure exists. .
- In unusual circumstances, physicians considering vaccinating infants aged <9 months or pregnant women should contact the Division of Vector-Borne Infectious Diseases (970) 221-6400) or the Division of Global Migration and Quarantine (404) 498-1600) at CDC for advice (see Precautions and Contraindications).
- Without a valid certificate of immunization against yellow fever, many countries require a 6-day quarantine of travelers coming from or going to recognized yellow fever zones of Africa and South America.
- Travelers to yellow fever endemic countries are encouraged to protect themselves from mosquitoes by using repellents, wearing protective clothing and using mosquito nets when rooms

are not screened. Unlike other vectors, the principal mosquito vectors of yellow fever bite during daytime hours.

- For more information regarding international travel and the yellow fever vaccine, contact the CDC's Traveler's Health Office at (877) 394-8747 or at www.cdc.gov/travel

ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Yellow Fever can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

Additional Information

In this Epi Manual:
DEET Fact Sheet
Mosquito Repellents Fact Sheet

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition*. Illinois, American Academy of Pediatrics, 2003.

Yellow Fever-Disease and Vaccine, Division of Vector-Borne infectious diseases: www.cdc.gov/ncidod/dvbid/yellowfever/index.htm

Evans, Alfred. *Viral Infections of Humans, Epidemiology and Control, Second Edition*. New York, Plenum Medical Book Company, 1984.

Heymann, D.L., ed. *Control of Communicable Diseases Manual, 19th Edition.* Washington, DC, American Public Health Association, 2008.

Mandell, G., Bennett, J., Dolin, R., eds. *Principles and Practice of Infectious Diseases, Fourth Edition*. New York, Churchill Livingstone Inc., 1995.

FACT SHEET YELLOW FEVER

What is Yellow Fever?
Yellow fever is a rapidly occurring viral illness of short duration with symptoms that may be mild to severe.

How is Yellow Fever spread?
Yellow fever is spread by the bite of an infected mosquito. A mosquito carries the virus from one person to another after sucking the blood of an infected person or animal, typically a monkey, and later biting a healthy person.

Who gets Yellow Fever?
All individuals are at risk except for those who have had yellow fever in the past or those who have been properly vaccinated against the virus. Those most at risk are travelers to areas where the virus is found, including South America and Africa. Yellow fever is not known to exist outside of these areas.

What are the symptoms of Yellow Fever?
Symptoms of yellow fever include sudden onset of fever, chills, headache, backache, all over muscle pain, a loss of strength and nausea and vomiting. Severe cases may include jaundice (a yellowing of skin and eyes), albuminuria (the presence of protein in the urine), and anuria (absence of urine).

How soon do symptoms appear?
Symptoms usually occur within 3 - 6 days after being bitten by an infected mosquito.

How long will symptoms last?
Symptoms usually resolve quickly after they develop. However, the illness may progress to more serious complications after a brief remission of hours to a day. These complications may include liver or kidney failure, as well as hemorrhagic symptoms including: nosebleeds, bleeding gums, or visible blood in vomit and stools. The overall case-fatality rate is 20 – 50%. Lifetime immunity follows yellow fever recovery.

How is Yellow Fever prevented?
Preventing exposure to infected mosquitoes is the best means of protection from the virus causing yellow fever. Although yellow fever is not usually found in Iowa, cases have been associated with very recent travel to areas where yellow fever is present. Mosquitoes in Iowa do not carry yellow fever but they can carry other viruses. Personal protection is the best way to prevent exposure to any virus spread by mosquitoes. Please review the DEET fact sheet and follow the recommendations to reduce the risk of being bitten by mosquitoes. This recommendation is appropriate when being outdoors in Iowa, South America or Africa.

There is a vaccine available to help prevent infection and illness from yellow fever. People traveling to South America and Africa who will be at an increased risk should be vaccinated prior to traveling to these areas. Most countries where yellow fever is found typically require travelers to be vaccinated before visiting. Contact your local health department or the Iowa Department of Public Health for a vaccination site nearest you.

Can infection with Yellow Fever occur more than once?
No, recovery from yellow fever is followed by immunity against future infections.

Yellow Fever

Investigator: **Agency:** **Phone number:**

FOR STATE USE ONLY

Status: ☐ Confirmed ☐ Probable ☐ Suspect ☐ Not a case

Reviewer initials:
Referred to another state:

CASE

Last name: _____ Date of Birth: / / Estimated? ☐ Age: _____

First and middle name: _____ Gender: ☐ Female ☐ Male ☐ Other _____

Maiden name: _____ Suffix: _____ Pregnant: ☐ Yes ☐ No ☐ Unk Est. delivery date: / /

Address line: _____ Marital status: ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Parent with partner ☐ Widowed

Zip: _____ City: _____ Race: ☐ American Indian or Alaskan Native ☐ Unknown ☐ Black or African American ☐ White ☐ Hawaiian or Pacific Islander ☐ Asian

State: _____ County: _____

Long-term care resident: ☐ Yes ☐ No ☐ Unknown Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino ☐ Unknown

Facility name: _____ Parent/Guardian name: _____

Facility phone: ( )- - Type: _____ Parent/Guardian phone: ( )- - Type: _____

EVENT

Onset date: / / Diagnosis date: / /

Event outcome: ☐ Survived this illness ☐ Died from this illness ☐ Died unrelated to this illness ☐ Unknown
Date of death / /

Event exception: ☐ Case could not be found ☐ Case could not be interviewed ☐ Case refused interview ☐ Other – see notes

Outbreak related: ☐ Yes ☐ No ☐ Unknown

Outbreak name: _____

Exposure setting: _____

Epi-linked: ☐ Yes ☐ No ☐ Unknown

Location acquired: ☐ In USA, in reporting state ☐ In USA, outside reporting state ☐ Outside USA ☐ Unknown

State: Country:

Healthcare provider information

Last name: _____

First name: _____

Provider type: ☐ ARNP ☐ MD ☐ PA ☐ DO ☐ NP

Facility name: _____

Address line 1: _____

Address line 2: _____

Zip code: _____ City: _____

State: _____ County: _____

Phone : ( )- - Type:

LABORATORY FINDINGS

Laboratory: _____ Specimen source: _____ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other _____

Accession #: _____ Result date: / / Result type: ☐ Preliminary ☐ Final

Collection date: / / Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate

Date received: / / Organism: **Yellow fever virus** Type:

Laboratory: _____ Specimen source: _____ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other _____

Accession #: _____ Result date: / / Result type: ☐ Preliminary ☐ Final

Collection date: / / Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Equivocal ☐ Positive ☐ Indeterminate

Date received: / / Organism: **Yellow fever virus** Type:

Laboratory: _____ Specimen source: _____ Test type: ☐ Serology (ELISA) ☐ PCR ☐ Other _____

Accession #: _____ Result date: / / Result type: ☐ Preliminary ☐ Final

Collection date: / / Test type: ☐ Acute ☐ Convalescent ☐ IgM ☐ IgG Result: ☐ Negative ☐ Positive ☐ Equivocal ☐ Indeterminate

Date received: / / Organism: **Yellow fever virus** Type:

OCCUPATIONS

Interpret 'occupation' very loosely and consider every person to have at least one 'occupation'.

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:

Date worked from: / / Address:

Date worked to: / / Zip code:

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

Occupation type: Job title:

Worked after symptom onset: ☐ Yes ☐ No ☐ Unknown Facility name:

Date worked from: / / Address:

Date worked to: / / Zip code:

Removed from duties: ☐ Yes ☐ No ☐ Unknown City: State: County:

Date removed: / / Phone: ( )- - Type:

Handle food: ☐ Yes ☐ No ☐ Unknown

Attend or provide child care: ☐ Yes ☐ No ☐ Unknown

Attend school: ☐ Yes ☐ No ☐ Unknown

Work in a lab setting: ☐ Yes ☐ No ☐ Unknown

Work in a health care setting: ☐ Yes ☐ No ☐ Unknown

Direct patient care duties: ☐ Yes ☐ No ☐ Unknown

Health care worker type:

HOSPITALIZATIONS

Was the case hospitalized? ☐ Yes ☐ No ☐ Unknown

Hospital: Isolated at entry: ☐ Yes ☐ No ☐ Unk Isolation type (entry):

Admission date: / / Discharge date: / / Days hospitalized:

Currently isolated: ☐ Yes ☐ No ☐ Unk Current isolation type:

CLINICAL INFO & DIAGNOSIS

Physician diagnosis:
☐ Encephalitis ☐ Meningitis ☐ Meningoencephalitis ☐ Fever
☐ Asymptomatic ☐ Hepatitis/jaundice ☐ Multi-system organ failure ☐ Other _____
☐ Dengue hemorrhagic fever/ Dengue shock

Clinical classification: ☐ Neuroinvasive ☐ Non-neuroinvasive

Symptoms:
☐ Acute flaccid paralysis ☐ Altered mental state ☐ Anorexia ☐ Coma ☐ Confusion ☐ Cranial nerve palsies
☐ Diarrhea ☐ Double vision ☐ Eye pain ☐ Fatigue ☐ Fever ☐ Gait/balance difficulty
☐ Headache ☐ Joint pain ☐ Muscle pain ☐ Nausea ☐ Photophobia ☐ Rash
☐ Stiff neck ☐ Swollen lymph nodes ☐ Tremors ☐ Vertigo ☐ Vomiting ☐ Other symptoms: _____

Pre-existing Conditions

Before your West Nile virus (WNV) infection, did a health care provider ever tell he/she had any of the following medical conditions?

☐ Diabetes
☐ High blood pressure (hypertension)
☐ Heart attack (myocardial infarction)
☐ Angina or coronary artery disease
☐ Congestive heart failure
☐ Stroke
☐ Chronic obstructive pulmonary disease (COPD)
☐ Chronic liver disease
☐ Kidney disease or failure
☐ Bone marrow transplant
☐ Alcoholism
☐ Case had none of the conditions listed

Before WNV infection, did the case ever have a solid organ transplant? ☐ Yes ☐ No ☐ Unk

If yes, what organ was transplanted:

If yes, what year was the transplant:

Before WNV infection, has the case ever had cancer? ☐ Yes ☐ No ☐ Unk *If yes*, what cancer type(s):

If yes, what year were you diagnosed:

If yes, are you currently being treated for cancer: ☐ Yes ☐ No ☐ Unk

Before WNV infection, did the case have any medical condition that limited his/her ability to fight infection? ☐ Yes ☐ No ☐ Unk **If yes, what condition:**

At the time WNV infection was diagnosed, was the case taking any of the following types of prescription medications or treatments?

☐ Chemotherapy	☐ Oral or injected steroids	☐ Medications to treat coronary artery disease
☐ Other treatments for cancer	☐ Inhaled steroids	☐ Medications to treat congestive heart failure
☐ Hemodialysis	☐ Insulin or other medications to treat diabetes	☐ Medications that suppress the immune system
☐ Other treatments for kidney disease	☐ Medications to treat high blood pressure	☐ Case was not on any medication/treatments listed

INFECTION TIMELINE

Enter onset date in dark-line box. Enter dates for start of exposure period and start and end of communicable period.

EXPOSURE PERIOD — **Onset** — **COMMUNICABLE PERIOD**

The incubation period for **Yellow fever** is 3 to 6 days.

No direct person to person transmission.

RISK FACTORS/TRAVEL

Ever vaccinated for Yellow Fever or Japanese encephalitis (JE)? ☐ Yes ☐ No ☐ Unknown

If yes, list MOST RECENT vaccination information ONLY:

Disease:	☐ Yellow fever ☐ JE	Disease:	☐ Yellow fever ☐ JE
Date vaccinated:	/ /	Date vaccinated:	/ /
Lot #:		Lot #:	
Vaccine type:		Vaccine type:	
Manufacturer:		Manufacturer:	

Number of vaccinations: ____

Risk Factors/Travel Information

In the 15 days prior to onset of symptoms did the case:

Travel within Iowa? ☐ Yes ☐ No ☐ Unk — City in Iowa: _____ — Departure date: / / — Return date: / /

Travel within U.S.? ☐ Yes ☐ No ☐ Unk — State: _____ City: _____ — Departure date: / / — Return date: / /

Travel outside U.S.? ☐ Yes ☐ No ☐ Unk — Country: _____ — Departure date: / / — Return date: / /

Exposed to mosquitoes: ☐ Yes ☐ No ☐ Unk

Use a mosquito repellent: ☐ Yes ☐ No ☐ Unk — If yes, how often? ☐ Sometimes ☐ Never ☐ Always ☐ Most of the time — If yes, what type? ☐ Picaridin ☐ DEET ☐ Oil of lemon eucalyptus ☐ Other _____

If the patient is female, was she:

Pregnant? ☐ Yes ☐ No ☐ Unk

Breastfeeding? ☐ Yes ☐ No ☐ Unk

NOTES:

Appendices A

Acronyms

ACIP
Advisory Committee on Immunization Practices
ACPHP
Academic Center for Public Health Preparedness
AIDS
Acquired Immune Deficiency Syndrome
AIIR
Airborne infection isolation room
ALT
Alanine amiontransferase
AMA
American Medical Association
APHL
Association of Public Health Laboratories
ASPH
Association of Schools of Public Health
AST
Aspartate transaminase
AVA
Anthrax Vaccine Adsorbed
AVRP
Anthrax Vaccine Research Program
ASPH
Association of Schools of Public Health
ASTHO
Association of State and Territorial Health Officials
ATSDR
Agency for Toxic Substances and Disease Registry
CADE
Center for Acute Disease Epidemiology
CBRN
Chemical, Biological, Radiological/Nuclear
CDC
Centers for Disease Control and Prevention
CDOR
Center for Disaster Operations and Response
CHI
Consolidated Health Informatics
CIA
Central Intelligence Agency
CIO
Centers, Institutes and Office
CISM
Critical Incident Stress Management
CLIA
Clinical Laboratory Improvements Act
CPHP
Centers for Public Health Preparedness
COOP
Continuity of Operations Plan
CSTE
Council of State and Territorial Epidemiologists
DEEDS
Division of Epidemiology, EMS, and Disaster Operations
DNA
Deoxyribonucleic Acid
DHHS
Department of Health and Human Services
DHS
Department of Homeland Security
DOE
Department of Energy
ECS
Emergency Communication System
EOC
Emergency Operations Center
EPA
Environmental Protection Agency
Epi-X
Epidemic Information Exchange
EIS
Epidemic Intelligence Service
EISO
Epidemic Intelligence Service Officer
ELISA
Enzyme Linked Immunosorbent Assay
ELR
Electronic Laboratory-Based Reporting
EPO
Epidemiology Program Office
ERT
Emergency Response Team
FBI
Federal Bureau of Investigation
FEMA
Federal Emergency Management Agency
FMO
Financial Management Office
FDA
Food and Drug Administration
FRP
Federal Response Plan
FRERP
Federal Radiological Emergency Response Plan
FTE
Full Time Equivalent

GIS
Geographic Information System
GMP
Good Manufacturing Practices
GPRA
Government Performance and Results Act of 1993
HACCP
Hazard Analysis Critical Control Point
HAN
Health Alert Network
HICPAC
Healthcare Infection Control Practices Advisory Committee
HIPAA
Health Insurance Portability and Accountability Act
HPP
Hospital Preparedness Program
HIV
Human Immunodeficiency Virus
ICRC
Injury Control Research Center
ICS
Incident Command System
IDSS
Iowa Disease Surveillance System
IDPH
Iowa Department of Public Health
IM
Intramuscular
IMS
Incident Management System
IOM
Institute of Medicine
IT
Information Technology
IV
Intravenous
LPHA
Local Public Health Agency
LRN
Laboratory Response Network
ME
Medical examiner
MSEHPA
Model State Emergency Health Powers Act
NACCHO
National Association for City and County Health Officials
NCBDDD
National Center for Birth Defects and Developmental Disease
NCCDPHP
National Center for Chronic Disease Prevention and Health Promotion
NCEH
National Center for Environmental Health
NCHS
National Center for Health Statistics
NCHSTP
National Center for HIV, STD and TB Prevention
NCID
National Center for Infectious Disease
NCIPC
National Center for Injury Prevention and Control
NEDSS
National Electronic Disease Surveillance System
NGO
Non-Governmental Organization
NHSN
National Healthcare Safety Network
NIP
National Immunization Program
NIOSH
National Institute for Occupational Safety and Health
NIH
National Institutes of Health
NLTN
National Laboratory Training Network
NPHIC
National Public Health Information Coalition
NPPTL
National Personal Protective Technology Laboratory
NPS
National Pharmaceutical Stockpile
NYCDOH
New York City Department of Health
OC
Office of Communication
OHS
Office of Health and Safety
OTPER
Office of Terrorism Preparedness and Emergency Response
OD
Office of the Director
OSEP
Office of Security and Emergency Preparedness

PPE
Personal Protective Equipment
PCP
Pneumocystis Carinii Pneumonia
PCR
Polymerase Chain Reaction
PFGE
Pulse Field Gel Electrophoresis
PHA
Public Health Advisor
PH
Public Health
PHEP
Public Health Emergency Preparedness
PHER
Public Health Emergency Response
PHIN
Public Health Information Network
PHPPO
Public Health Practice Program Office
PMR
Preventive Medicine Resident
PVS
Pre-Event Vaccination System
SAP
Select Agent Program
SARS
Severe Acute Respiratory Syndrome
SCBA
Self Contained Breathing Apparatus
SLPP
State and Local Preparedness Program
SME
State Medical Examiner
SNS
Strategic National Stockpile
SVP
Smallpox Vaccination Program
SWOC
Strengths, Weaknesses, Opportunities and Challenges
TARU
Technical Advisory Response Unit
TED
Training, Education and Demonstration Package
TOPOFF
Top Officials
TRPLT
Terrorism Response and Preparation Leadership Team
US
United States
USDA
United States Department of Agriculture
VAERS
Vaccine Adverse Effects Reporting System
VFC
Vaccines for Children
VIG
Vaccinia Immune Globulin
VMI
Vendor Managed Inventory
WaterCAD
Water Computer Aided Design
WHO
World Health Organization
XML
Extensible Markup Language
24x7
Twenty four hours a day, seven days a week

Glossary

Antigen - That part of an agent (bacteria, virus, etc.) capable of stimulating the production of specific antibodies.

Antibody - An immunoglobulin found in tissue fluids and blood serum that is produced in response to the stimulus of a specific antigen and is capable of combining with that antigen to neutralize or destroy it.

Airborne precautions - Precautions that apply to patients known or suspected to be infected with epidemiologically important pathogens that can be transmitted widely by air currents and may become inhaled by or deposited on a susceptible host within the same room or, depending on environmental factors, over a longer distance from the source patient. These precautions are designed to reduce the risk of such airborne transmission of infectious agents through personal protection devices, such as N95 masks, and special air handling and ventilation systems, such as airborne infection isolation rooms. (Adapted from CDC/HICPAC guidelines.)

Airborne infection isolation room (AIIR) - A single patient room in which environmental factors are controlled to minimize the transmission of infectious agents that can be transmitted by the airborne route. These rooms have specific requirements for controlled ventilation, negative pressure, and air filtration and monitoring that are detailed in Guideline for Environmental Infection Control in Health-Care Facilities, 2003.

Arthralgia - Pain in a joint without objective signs (see arthritis).

Arthritis - Swelling, redness, tenderness, or other specific signs of inflammation in a joint.

Aseptic - Absence of infectious microorganisms; free from infection; sterile. (Sometimes used to mean absence of bacteria, example; aseptic meningitis may be caused by virus).

Asymptomatic - Without objective evidence of disease or condition.

Attack Rate - A measure of the frequency of cases of a disease in a narrowly defined population during a specific interval of time, as in epidemics (# of cases/# of people exposed x 100). Usually expressed as a percent.

Bacteria - Unicellular microorganism. There are three principal forms: spherical or ovoid forms called cocci; rod-shaped forms called bacilli or vibrios; and spiral forms called spirilla or spirochetes.

Bioemergency - A situation in which a pathogen poses an immediate and severe threat to the lives or health of people in Iowa, to the extent that day-to-day operations of public health authorities are insufficient to address this threat.

Carrier - A person or animal that harbors a specific infectious agent (but manifests no discernible clinical disease) and is a potential source of

infection for man or animals. The carrier state can occur in an individual after an infection (which was either asymptomatic or symptomatic and resolved).

Case - An infected or diseased person or animal having specific clinical, laboratory, or epidemiologic characteristics.

Case Definition - A set of standard criteria for deciding whether a person has a particular disease or health-related condition, by specifying clinical criteria and limitations on time, place, and person (Retrieved from CDC at www.cdc.gov/osels/ph_surveillance/nndss/casedef/index.htm on 3/15/11).

Case Fatality Rate - A measure of the likelihood that an ill person (i.e., one who exhibits symptoms) will die as a result of that illness (adapted from Gordis, 2000:44); can be expressed by the ratio:

$$\frac{\text{number who die within a specified time after disease onset or diagnosis}}{\text{number ill}}$$

Chemoprophylaxis - The administration of a medicine, including antibiotics, to prevent the development of an infection or prevent the progression of an infection to clinical disease. Example: Rifampin for exposure to meningococcal disease.

Cohort - Any defined group of persons selected for a special purpose or study. (From the Latin cohors, warriors, the tenth part of a legion).

Cohorting - Method to isolate separate infectious persons from susceptible ones by grouping persons with the same infection together. Cohorting of staff is to assign specific staff to a group of patients and not have them do care on the unaffected clients.

Colonization - Propagation of a microorganism on or within a host without causing cellular injury or infection. A colonized host can serve as a source of infection. Carriers are often said to be colonized with a pathogen.

Communicable Disease - An illness which is caused by a specific infectious agent or its toxic products, and which arises through transmission of that agent or its products from a reservoir to a susceptible host.

Complement - A chemical in the immune system which can provoke the disintegration of bacteria. It is present in all sera. Complement is not an antibody but may work with antibodies to destroy bacteria.

Contact - A person or animal that has been in such association with an infected person or animal, or a contaminated environment, as to have had an opportunity to acquire the etiologic agent.

Contact Precautions - Precautions that apply to patients known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by direct or indirect contact. Direct-contact transmission involves skin-to-skin contact and physical transfer of microorganisms to a susceptible host from an infected or colonized person, while indirect-contact transmission involves contact of a susceptible host with a contaminated intermediate object. (Adapted from CDC/HICPAC guidelines.)

Culture - The growth of microorganisms on or in substances (especially laboratory media prepared for this purpose).

Droplets - Liquid particles expelled into the air during the act of talking, spitting, singing, coughing, or sneezing. Droplets are formed through aerosolization of secretions present in the mouth, nasopharynx and bronchi. They can contain infectious microorganisms.

Droplet Nuclei - The dried residues of droplets which may contain one or more infectious microorganisms. In contrast to droplets, droplet nuclei can remain suspended in the air for long periods.

Droplet Precautions - Precautions that apply to any patient known or suspected to be infected with epidemiologically important pathogens that can be transmitted by infectious droplets generated from the source person during coughing, sneezing, or talking or during the performance of certain procedures such as suctioning or bronchoscopy. Unlike airborne precautions, because droplets travel only short distances ($\leq$ 3 ft.) and do not remain suspended in the air, special air handling and ventilation are not required to prevent droplet transmission. (Adapted from CDC/HICPAC guidelines.)

Ecchymosis - A large, irregularly formed hemorrhagic area of skin. Like a large bruise the color is blue-black changing to a greenish-brown or yellow. May occur with a large bruise.

Epidemic - The occurrence of cases of a disease in human populations in a particular geographic area clearly in excess of the usual incidence.

Common-source epidemic - An epidemic in which one human or one animal or specific vehicle (e.g., food or water) is responsible for transmitting the agent to the case/s identified.

Point-source epidemic - like a common source but limited to a short time period (e.g., a meal).

Propagated-source epidemic - An epidemic in which infections are transmitted from person to person or animal to animal in such a fashion that identified cases cannot be attributed to a single source.

Epidemiologist - A person who applies epidemiologic principles and methods to the prevention and control of disease.

Epidemiology - The study of the distribution and causes/risk factors of disease in human populations.

Epidemiologically linked case - A case in which a) the patient has had contact with one or more persons who either have/had the disease or have been exposed to a point source of infection (i.e., a single source of infection, such as an event leading to a foodborne-disease outbreak, to which all confirmed case-patients were exposed) and b) transmission of the agent by the usual modes of transmission is plausible. A case may be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory confirmed.

Erythema - Redness of the skin due to capillary dilatation.

Etiology - The study or theory of the causes of disease. An etiologic agent is that which causes disease.

Exposure - The opportunity of a susceptible host to acquire an infection by either a direct or indirect mode of transmission. Example: being bitten by an ill skunk is a potential exposure to rabies.

Fomites - Inanimate objects, such as toys or articles of clothing, which can become contaminated and, therefore, be a vehicle for transmission.

Fungi - Simple, dependent plants including molds, rusts, mushrooms, toadstools, lichens and yeasts. Some forms are pathogenic to animals. Example: vaginal "yeast infections".

Hand Hygiene - A general term that applies to hand washing, antiseptic handwash, antiseptic hand rub, or surgical hand antisepsis. (CDC)

Health Care Provider - A person who is trained and licensed to give health care. Also, a place licensed to give health care. Doctors, nurses, hospitals, skilled nursing facilities, some assisted living facilities and certain kinds of home health agencies are examples of health care providers. (From the Medicare web site.)

Host - Organisms, including humans, that are capable of being infected by a specific agent.

Hypothesis - An unproven assertion or statement based on available information, which commonly deals with the identity of an etiologic agent, the source of infection and the mode of transmission. Its role is to provide a rational basis for further investigation.

Illness - A subjective state, or experience, characterized by the impairment of normal physiological function and affecting part or all of an organism

(Last, 2001:90 and Princeton University, retrieved 3/10/04).

Immune Globulin - A sterile solution of proteins made up of antibodies that are present in adult human blood. Example: RIG - rabies immune globulin.

Immunoglobulin - A protein that functions as an antigen receptor.

Immunity - Immunity is often used to refer to antibody status.

Passive immunity refers to antibodies acquired from an outside source either naturally (by maternal transfer) or artificially (by inoculation of specific protective antibodies -- convalescent or immune serum, or immune globulin). Passive immunity is of brief duration (days or months).

Active immunity lasts years, and is acquired either naturally (by actual infection), or artificially (by inoculation with a vaccine).

Immunodeficient - Lacking in the ability to mount an immune response in response to an antigen.

Incidence - Number of new cases of a disease occurring within a particular population during a specified period of time.

Index Case - The first case among a number of similar cases which are epidemiologically related. Index cases are often identified as a source of contamination or infection.

Induration - Extremely hard or firm tissue (e.g. what is measured in a reactive Tuberculin skin test)

Infection - The entry and multiplication of an infectious agent in body tissues of man or animal, resulting in cellular injury.

Infectious Agent - An organism, usually a microorganism but including larger parasites (such as worms), that is capable of producing infection or infectious disease.

Infectious Disease - A disease of man or animal resulting from an invasion of the body by pathogenic agents and the reaction of the tissues to these agents and/or the toxins they produce.

Infection Control Precautions - Measures used for decreasing the risk of transmission of microorganisms, particularly in health care facilities or when otherwise providing medical care. These fall into standard, contact, droplet, and airborne categories, which are also defined in this section. (Adapted from CDC/HICPAC guidelines)

Infectivity - A measure of the likelihood that a person exposed to a pathogen will become infected (i.e., the agent enters, multiplies, and survives within the host) (adapted from Nelson, 2001:27); can be expressed by the ratio:

$$\frac{\text{number infected}}{\text{number exposed}}$$

Infestation - The lodgment, development, and reproduction of arthropods (e.g., scabies, lice on the body or in the clothing.)

Inflammation - Normal tissue response to cellular injury or foreign material, characterized by dilation of small blood vessels (capillaries) that usually cause erythema (redness) and warmth and mobilization of defense cells (blood and tissue white blood cells that form pus).

Isolation - The separation, for the period of communicability, of infected persons or animals from those that are not infected, in such places and under such conditions as will prevent the direct or indirect transmission of the infectious agent from those infected to those who may be susceptible or who may spread the agent to others.

Mean - Called "the average" in arithmetic. The mean is calculated by adding together all the observed values and dividing by the number of observations.

Monospot - Agglutination test to detect the Epstein-Barr virus (the cause of mononucleosis).

Morbidity - Any departure from a state of well-being.

Myalgias - Tenderness or pain in the muscles.

Nanometer - One billionth of a meter.

Nosocomial Infection - An infection resulting from exposure to a source within a health-care facility. The term is applied to such infections transmitted between inpatients, visitors, and hospital personnel.

Nosocomial - A term used to denote a new disease or condition acquired within a healthcare setting, for example a hospital-acquired infection.

Outbreak - The occurrence of two or more cases of a disease which are epidemiologically related.

Pandemic - An epidemic disease affecting people in several countries or continents. Example: In 1919, there was an influenza pandemic.

Parasite - An organism (often microbial) which lives in or on another organism, at their expense. Parasites are not necessarily harmful to their host.

Pathogen - An agent capable of causing disease.

Pathogenicity - The ability of an agent to cause disease in a susceptible host.

Permucosal - By means of a mucous membrane. Example: Permucosal spread of hepatitis B can occur, especially in health care settings.

Personal Protective Equipment - The equipment and clothing required to mitigate the risk of injury from or exposure to hazardous conditions encountered during the performance of duty. (From the National Oceanographic and Atmospheric Association)

Petechiae - Small, purplish, hemorrhagic spots on the skin, mucous membranes, or serous surfaces. These are small areas under the skin, which may be due to an abnormality of blood clotting mechanism.

Phagocyte - A cell which engulfs and destroys foreign particles or microorganisms by digestion.

Primary Case - The person who first introduces a disease into a defined group, such as a family, and therefore the means by which members of this group may contract the disease. Compare with the definition for index case (adapted from Last, 2001:142 and Gordis, 2000:22).

Prodromal Period - The prodromal period is that lapse of time between the first vague symptom of disease and the full clinical syndrome upon which a diagnosis can be based.

Prophylaxis - Measures taken to prevent the development or spread of disease.

Protozoa - A unicellular animal which usually reproduces asexually by fission.

Public Health Disaster - Defined in Iowa Code section 135.140 as "a state of disaster emergency proclaimed by the governor in consultation with the department [i.e., IDPH] pursuant to section 29C.6 for a disaster which specifically involves an imminent threat of an illness or health condition that meets any of the following conditions of paragraphs I and II:

I. *Is reasonably believed to be caused by any of the following:*

a. Bioterrorism or other act of terrorism. The appearance of a novel or previously controlled or eradicated infectious agent or biological toxin. A chemical attack or accidental release.

b. An intentional or accidental release of radioactive material.

c. A nuclear or radiological attack or accident.

II. Poses *a high probability of any of the following:*

a. A large number of deaths in the affected population. A large number of serious or long-term disabilities in the affected population.

b. Widespread exposure to an infectious or toxic agent that poses a significant risk of substantial future harm to a large number of the affected population."

Although this statutory definition includes the conditions for a "bio-emergency," as defined earlier in this section, it also encompasses conditions that are not addressed in this plan, including chemical, radioactive, radiological, and nuclear incidents. Also, not every set of conditions that may be considered a bio-emergency by IPDH officials will result in the proclamation of a public health disaster.

Purpura - A small hemorrhage in the skin, mucous membrane or serosal (serous membrane) surface which can have various manifestations. Hemorrhage into the skin becomes red, then darkens into purple, then brownish-yellow and finally disappears in 2-3 weeks. Areas of discoloration do not disappear under fingertip pressure.

Quarantine - The limitation of freedom of movement of persons or animals that have been exposed to a communicable disease, within specified limits marked by placards, for a period of time equal to the longest usual incubation period of the disease.

Ratio - A measure of the frequency of one group of events (e.g., the number of males having a specified disease) relative to the frequency of a different group of events (e.g., the number of females having the specified disease). Example: The male to female ratio for legionellosis is 2.5/1.

Resistance - The sum total of host mechanisms which interpose barriers to invasion or multiplication of infectious agents, or that prevent damage by the agent's toxic products.

Reservoir - The habitat where the etiologic agent of a disease normally thrives, grows, and replicates. A reservoir may be human (anthroponotic), animal (zoonotic), or a nonliving environment, such as soil or water (sapronotic). A characteristic feature of most diseases with non-human reservoirs is that once transmitted to humans, the epidemic chain is usually aborted, although the clinical course might be sometimes quite severe, even fatal. (Hubálek:403).

Rickettsia - A class of bacteria, which like viruses, can only multiply inside other cells.

Risk - The likelihood that a person having specified characteristics (e.g., age, sex, immune status) will acquire a specified disease.

Secondary Attack Rate - The frequency of new disease cases among close contacts of known cases. Secondary attack rates are usually calculated for household contacts. Example: The household secondary attack rate for Shigella can be over 50%.

Sepsis - When a symptomatic person is found to have pathogenic microorganisms or their toxins in the blood.

Serotyping - The characterization of different strains of a microorganism by the reaction of different stocks of sera with that organism.

Sign - Objective (can be detected by others) evidence of a disease.

Sporadic Case - A case with no known epidemiological relationship to any other case(s).

Standard Precautions - Precautions designed for the care of all patients in health care facilities regardless of their diagnosis or presumed infection status and intended to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection. The main focus is on hand hygiene, the use of protective barriers, and the proper handling of clinical waste. The precautions apply to (1) blood; (2) all body fluids, secretions, and excretions (except sweat), regardless of whether or not they contain visible blood; (3) non-intact skin; and, (4) mucous membranes. (Adapted from CDC/HICPAC guidelines.)

Surveillance of Disease - The continuing scrutiny of the aspects of the occurrence and spread of a disease that are pertinent to effective control.

Susceptible - A person or animal lacking sufficient resistance to a particular pathogenic agent to prevent disease if exposed.

Symptom - Subjective (cannot be detected by others) evidence of a disease.

Syndrome - The set of signs and symptoms which typify a particular disease.

Toxin - Proteins or conjugated protein substances which can cause disease. They are produced by some higher plants, certain animals, and pathogenic bacteria.

Toxoid - A preparation containing detoxified toxin. Toxoids are used to induce specific active immunity to the related toxin.

Transmission Mode - The means by which disease organisms are spread. For the purposes of this plan, the term applies to how they are spread to humans.

Travel Advisory - A recommendation against nonessential travel to the area(s) for which it is issued. Travel advisories are issued when the health risk for travelers is thought to be high, and are intended to reduce the number of travelers to high-risk areas and the risk for spreading disease to other areas. (Adapted from CDC guidance).

Travel Alert - A lower-level notice than a travel advisory that provides information about the disease outbreak and informs travelers how to reduce their risk of acquiring the infection. An alert does not include a recommendation against nonessential travel to the area. (Adapted from CDC guidance).

Triage - The process for sorting ill or injured people into groups based on their need for or expected benefit from medical treatment. The purpose is to provide for the efficient use of medical and nursing staff and associated facilities.

Vaccine - A preparation containing killed or living whole microorganisms or a fraction of the organisms having antigenic properties. Vaccine is employed to induce, in the recipient, a specific active immunity to an infectious agent (usually an antibody response).

Vector - An insect (e.g., tick) or any living carrier that transports an infectious agent from a source of infection to a susceptible host.

Vehicle - An object or substance that can carry microorganism to a new host.

Virus - Minute organisms not visible with ordinary light microscopy. They can reproduce only inside of a host cell.

Virulence - The amount of power and the degree of pathogenicity possessed by organisms.

Zoonosis - An infection or an infectious disease transmissible under natural conditions between animals and man.