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ISOLATION TECHNIQUES

for use in HOSPITALS

SECOND EDITION — 1975

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
Atlanta, Georgia 30333

UNITED STATES PUBLIC HEALTH SERVICE

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION
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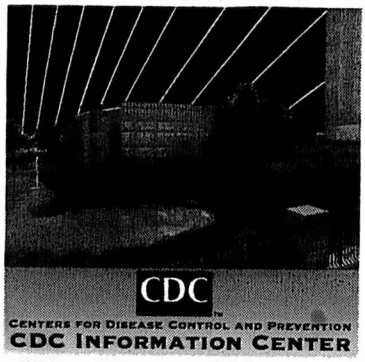

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PREFACE TO THE SECOND EDITION

MORE THAN 70,000 COPIES of *Isolation Techniques for Use in Hospitals* have been distributed since it was first published in 1970. Many hospitals have adopted the manual in its entirety as the established isolation practice, while others have used it as the framework on which to build their own guidelines. Because of this broad acceptance of the first edition, we have approached the revision of this manual with some reluctance, realizing that each change will require re-educating hospital personnel. Nonetheless, we have become convinced that changes in the manual are necessary because of the continuing rapid growth of knowledge about risk factors and modes of transmission of nosocomial infections.

In order to ease the conversion from the old guidelines to those outlined in this edition, we have kept the same organization and format. Communicable diseases likely to be seen in hospitals in the United States are grouped according to their presumed modes of transmission; for each category, methods of preventing nosocomial transmission are outlined.

Isolation recommendations for infections of burns, skin, and wounds have been revised. Table 1 (facing page) summarizes the placement of these infections based upon the responsible microorganism and the extent of infection.

As a further aid to institutions that have been using this isolation manual, we include here a brief outline of the major changes incorporated in this second edition. Table 2 lists diseases according to their current placement and notes their previous placement. In addition to these changes of placement in categories of isolation, we have altered a number of recommendations as to methods of isolation. Many of these alterations are minor, but some have substantial import. We urge those charged with the responsibility for controlling nosocomial infections to review the entire manual.

Undoubtedly, changes in medical practice and our understanding of the epidemiologic characteristics of diseases will make further revision of this manual necessary. The editors and consultants appreciate the criticisms and suggestions offered by those who have used the first edition, and we hope that users of this revised edition will also offer their comments.

Table 1. Isolation category of burn, wound, and skin infections, by microorganism and extent of infection

MICROORGANISM	INFECTION		
	Major[1]	Limited[2]	Minor[3]
Staphylococcus aureus	SI	WSP	SeP
Group A streptococcus	SI	WSP	SeP
All other microorganisms	WSP	WSP	SeP

[1] When infected area is not covered with dressings, or when dressings do not adequately contain the purulent drainage.

[2] When dressings cover the infected area and also adequately contain all purulent discharges.

[3] When the infected area is very small, such as with stitch abscesses.

SI - Strict Isolation

WSP - Wound & Skin Precautions

SeP - Secretion Precautions—Lesions

Table 2. Changes in isolation categories, by disease

DISEASE	ISOLATION CATEGORY	
	Current (2nd ed.)	Former (1st ed.)
Acute diarrhea, suspected infectious etiology	ENTERIC	—
Amebiasis	EXCRETION	none
Candidiasis, mucocutaneous	SECRETION	none
Conjunctivitis, viral	SECRETION	—
Cryptococcosis	none	Secretion
Enterotoxic *Escherichia coli*—diarrhea	ENTERIC	—
Hepatitis, type unspecified, syndrome compatible with viral etiology	BLOOD and ENTERIC	—
Herpangina	SECRETION and EXCRETION	Excretion
Herpesvirus hominis (herpes simplex)	SECRETION — LESIONS and ORAL	Secretion—Oral
Herpes zoster		
disseminated	STRICT	Respiratory
localized	WOUND & SKIN	Respiratory
Infectious mononucleosis	SECRETION	—
Lassa fever	STRICT	—
Marburg virus disease	STRICT	—
Melioidosis		
extrapulmonary with draining sinuses	WOUND & SKIN	Strict
pulmonary	SECRETION	Strict
Plague, bubonic	WOUND & SKIN	Strict
Puerperal sepsis, Group A streptococcus—vaginal discharge	WOUND & SKIN	—
Rubella (except Congenital rubella syndrome)	RESPIRATORY	Strict*
Staphylococcal enterocolitis	ENTERIC	Strict
Varicella (chickenpox)	STRICT	Respiratory
Venezuelan equine encephalitis	none	Respiratory
Yersinia enterocolitica gastroenteritis	ENTERIC	—

"—" no recommendation in 1st ed.
"none" isolation specifically not called for
* rubella appeared in Strict (error) and Respiratory (correct) Isolation

PREFACE TO THE FIRST EDITION

HUNDREDS OF REQUESTS for information about effective methods of isolating hospitalized patients have been received by the Center for Disease Control. Several monographs (*1-6*) on isolation are currently available, but most have failed to satisfy the needs of hospitals for either of 2 reasons: 1) The isolation recommendations are too abbreviated to serve as an adequate guide for hospital personnel, or 2) the recommended practices are much too costly, complicated, or time-consuming to be effectively utilized. A need, therefore, exists for a manual of isolation procedures that are described in adequate detail and that can be applied by small community hospitals with limited resources, intermediate-size hospitals, and large, metropolitan, university-associated medical centers. This manual has been designed to meet this need and to establish a balance between the ideal and the practical. These recommendations have been extended to cover all communicable diseases that can reasonably be expected to occur within the United States, as well as those that might be imported.

Many of the procedures discussed in this manual are applicable when ministering to the needs of any hospitalized patient, not just those with infectious diseases. Personnel can be lulled into a false sense of security when applying these principles to infected patients and practice poor techniques when handling noninfected patients. One excellent example of a principle that should be applied in the general care of all hospitalized patients is handwashing before and after each patient contact.

Disagreement with some of the suggestions is expected since there are gaps in the knowledge of the epidemiology of some infections. Additionally, there is conflicting evidence as to the route of spread of certain diseases, as well as the effectiveness of specific control measures. There are some diseases for which there are 2 routes of transmission: 1 that accounts for almost all instances of spread within hospitals, and the other that is very rare, possibly only theoretical. In these instances, the type of isolation recommended is that which considers the common route of transmission.

The recommendations in this manual are considered to be reasonable proposals derived from analysis of current epidemiologic and microbiologic data. An attempt has been made to eliminate ritual and establish practical, effective procedures—based on fact—for isolating the disease and not the patient. Revisions of some of these proposals may be necessary as information about hospital-associated infections accumulates. Hospitals are encouraged to modify or supplement this manual to meet their own needs.

These principles of isolation can also be applied in other patient-care institutions, such as nursing homes, sanitoria, and mental institutions; the specific techniques may need to be modified for each.

This manual has been designed for general use by all hospital personnel. The main body of the manual, defining the different categories of isolation and precautions, is divided into 6 sections. Each section is a self-contained unit with all the necessary information pertaining to the 1 particular category of isolation or precautions; thus, there is some repetition among sections. One appendix lists the infectious diseases, grouped according to the requirements for private room, masks, gowns, gloves, and control of excretions and secretions necessary to limit cross-infection (Appendix I). Diseases are then listed alphabetically, with the type and duration of isolation (Appendix II). Other appendices detail methods of laundering clothing of patients who are placed in Strict Isolation (Appendix III), the classification and handling of patients with burns (Appendix IV), the precautions for smallpox (Appendix V), the requirements for an effective hospital surveillance program (Appendix VI) [not included in the second edition], and current recommendations for chemical disinfection and sterilization of medical and surgical materials and other inanimate objects in hospitals (Appendix VII [VI in the second edition]).

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Introduction

TO PREVENT the spread of communicable diseases within hospitals, special procedures should be followed for patients with these diseases. The decisions regarding which diseases to isolate and which isolation procedures to utilize require an understanding of the epidemiology of each infectious disease in the hospital setting.

SPREAD OF INFECTION

Spread of infection within the hospital requires only 3 essential elements: a source of infecting organisms, a means of transmission for the organism, and a susceptible host.

I. Source

The *sources* of the infecting agent may be patients, visitors, or employees and include persons with active disease, ones in the incubation period of the disease, or persons who are colonized by the infectious agent but have no apparent disease (carriers). Another direct source of infection can be the patient's own endogenous flora (autogenous infection). Other potential sources include inanimate objects in the environment that have become contaminated.

II. Transmission

Microorganisms are *transmitted* by various routes, and the same microorganism may be transmitted by more than 1 route. For example, the virus of smallpox can spread either by the airborne route (droplet nuclei or dust) or by direct contact. Shigellae are transmitted by direct contact, either with contaminated excretions, food, or hands. The differences in infectivity and in the mode of transmission of the various agents form the basis for the several categories of isolation and precautions that have been devised. There are 4 main *routes of transmission*—contact, vehicle, airborne, and vectorborne.

A. The **CONTACT ROUTE** can be further divided into 3 subgroups:

1. **Direct contact**—This involves direct physical transfer between a susceptible host and an infected person, such as occurs between patient and hospital personnel when they are giving baths or back rubs, changing dressings, or performing other procedures requiring direct personal contact. Direct contact can also occur between 2 patients, 1 serving as the source of infection and the other as susceptible host.

2. **Indirect contact**—This involves personal contact of the susceptible host with inanimate articles, such as bed linens, clothing, instruments, and dressings that have become contaminated.

3. **Droplet contact**—Infectious agents may come in contact with the conjunctivae, nose, or mouth of a susceptible individual as a result of coughing, sneezing, or talking by an infected person with clinical disease or a carrier of the organism. This is considered a "contact" infection because close association is necessary since droplets usually travel no more than about 3 feet.

B. The **VEHICLE ROUTE** applies in diseases transmitted through the medium of contaminated

1. **food,** such as salmonellosis,
2. **water,** such as shigellosis,
3. **drugs,** such as bacteremia resulting from infusion of a contaminated infusion product, or
4. **blood,** such as hepatitis.

C. **AIRBORNE TRANSMISSION** occurs by the dissemination of either droplet nuclei (residue of evaporated droplets that may remain suspended in the air for long periods of time) or dust particles in the air containing the infectious agent. Organisms carried in this manner are subsequently inhaled by, or deposited on, the susceptible host.

D. **VECTORBORNE** transmission, the fourth route, is of greater significance in other countries; for example, mosquito-transmitted malaria. It is of little significance in hospitals in the United States.

III. Host

The third element necessary for the establishment of an infection is the *susceptible host.* Resistance to pathogenic microorganisms varies markedly. Persons with diabetes mellitus, lymphomas, leukemia, neoplasia, agranulocytosis, or uremia and those treated with certain antibiotics, corticosteroids, irradiation, or immunosuppressive agents may be particularly prone to infection. Age, chronic debilitating disease, shock, coma, and trauma (accidental or surgical) also influence susceptibility. Some individuals may be immune or able to resist colonization by an infectious agent, others exposed to the same agent may establish a commensal relationship with the infecting organism and become healthy carriers, while others may develop clinical disease.

PRINCIPLES OF ISOLATION

Isolation procedures are designed to prevent the spread of microorganisms among patients, hospital personnel, and visitors. Since agent and host factors are more difficult to control, interruption of the chain of infection is directed primarily at transmission. Isolation presents certain disadvantages to both the hospital and the patient. The procedures may be time-consuming and add to the cost of hospitalization. They may render frequent visits by physicians, nurses, and aides inconvenient, and they may discourage the hospital staff from giving the best possible care

to the isolated patient. The occasional requirement of a private room monopolizes valuable space that could otherwise accommodate several patients. Solitude deprives the patient of normal social relationships and may be psychologically injurious, especially for children. In an attempt to balance these disadvantages of isolation against the varying hazards posed by the communicable diseases, degrees of isolation have been designated; the essentials of each are printed on cards designed to be used with this manual and meant to be attached to each isolated patient's door or bed. A card system allows for rapid institution of the appropriate isolation procedure, and each card provides a ready list of essential instructions for persons who may enter the vicinity of the isolated patient. On occasion, these cards have been modified and reprinted by hospitals; for example, 1 institution illustrates by pictures whether gowns, masks, or gloves are necessary for persons who will have direct and indirect contact with the patient.

THE CARD SYSTEM OF ISOLATION

The card system is designed to give concise information about isolation procedures for specific communicable diseases. All isolation procedures fall into the following categories:

1. Strict Isolation
2. Respiratory Isolation
3. Protective Isolation
4. Enteric Precautions
5. Wound & Skin Precautions

Procedures for controlling cross-infection from diseases within the next 2 categories are so routine that we have not prepared cards for them. However, some institutions have found cards for these categories useful and have printed them locally:

1. Discharge Precautions
   - Secretion Precautions
     - Lesions
     - Oral
   - Excretion Precautions
2. Blood Precautions

Dividing infectious diseases into categories of isolation or precautions makes it necessary to compromise on some epidemiologic factors in order to limit the number of categories. Certain precautions that are necessary for the majority of the illnesses within a given category may be superfluous for others. Where compromise has been necessary, the recommendations generally incorporate the more rigorous precaution. For example, as shown in Appendix I, when a patient has staphylococcal pneumonia, only persons with direct patient contact need wear gowns and gloves; however, staphylococcal pneumonia in other respects should

be in the Strict Isolation category, so it is necessary, as shown on the Strict Isolation card (*see* below), to recommend that anyone entering the room wear a gown and gloves. Despite shortcomings, this classification system avoids the confusion of other systems that demand different isolation requirements for almost every infectious disease.

In Appendix II, all communicable diseases considered for isolation are listed alphabetically with the type of isolation recommended and the recommended length of time the patient must be kept in isolation or under special precautions. This appendix also includes infectious diseases for which isolation is not necessary.

It is safer to "over-isolate" than "under-isolate." For the patient who may have a disease requiring isolation but whose diagnosis has not yet been established, it is important to institute the appropriate precautions rather than wait for confirmation of the diagnosis. Furthermore, precautions may be required even though the patient does not fully meet the criteria of any category of isolation outlined. For example, patients with bacteriuria and indwelling urinary catheters are known to serve as reservoirs of infection for roommates who also have indwelling urinary catheters. Passive carriage on the hands of personnel who provide urinary catheter care serves to transmit these infections. Thus, noninfected patients with catheters should not, where practical, share rooms with catheterized patients who have bacteriuria.

On the other hand, formal isolation practices may have to be modified for an infected patient who needs constant care or whose clinical condition may require emergency intervention. But when such modifications are made, it is essential that the increased risk to other patients or personnel of acquiring nosocomial infection be minimized.

A supply of the 5 different, distinctively colored, disposable cards —1 for each category of isolation and precautions (except for Discharge and Blood Precautions)—should be kept at each nurses' station. The front of the card lists the major steps to be taken by anyone entering the room or area. On the removable backing on the reverse side of each card is a list of the communicable diseases requiring these procedures. The sticky back (pressure-sensitive) of the card makes it easy to attach the appropriate card to the patient's door, chart, bed, etc. Detailed information about procedures required for each category of isolation is included in the text of this manual.

A particular institution may prefer to handle patients with certain infections differently for psychological or other reasons; we encourage each hospital to adjust these guidelines to fit its needs.

General Principles

General Principles

General Principles

THE GENERAL PRINCIPLES that apply to patients in isolation and precautions can be divided into A) specifications (following the format found in the specific discussions of each category), B) general techniques, and C) hospital and patient responsibilities. Not every specification or technique is required for each category, as indicated in the individual sections. "No special precautions" means follow standard hospital procedures used for noninfected patients.

The physical arrangements for isolation will vary according to the patient population served. Estimates of facilities needed for isolation have been projected for general community hospitals (Garner JS, Kaiser AB: How often is isolation needed? Am J Nurs 72:733-737, 1972). In some institutions a special and separate ward may be reserved for patients requiring isolation or the use of precautions. In others, the pattern may be to have special rooms located in different areas within the hospital or use whatever rooms or areas are available when needed. Intensive care units should have provisions for isolation. There may also be a need for a special treatment room for patients with infections. A large pediatric service may well need a ward or wards for isolating patients with a specific type of communicable disease, especially during periods of high prevalence. A newborn nursery should have an area where infected infants and infants suspected of being infected can be completely separated from well infants.

Some institutions may have a permanent team of house officers, nurses, and paramedical personnel to handle the isolated patients. Others will allow the personnel on the floor to care for these patients. These decisions must be made by individual hospital staffs.

"Duration of illness," used in discussing length of isolation, refers to the period during which the patient is infective. This may be defined by the duration of clinical symptoms or by the ability to recover the etiologic agent from the patient.

A. SPECIFICATIONS

1. **Room**—A private room should contain handwashing, bathing, and connecting toilet facilities. The last obviates the need for portable commodes or special transportation techniques for commodes, bedpans. and urinals. The implementation of isolation can be simplified if special rooms on 1 or more wards are available for isolation. The room or area should have minimum ventilation (supply and exhaust) of 6 air changes per hour. Such areas should be constructed so that there is no

cross-circulation or recirculation of air, unless passed through high-efficiency filters, between the isolation room and other sections of the hospital. An anteroom between the room and the hall, especially for rooms housing patients in Strict Isolation or Respiratory Isolation, will help in maintaining these 2 categories of isolation by providing storage space for gowns, gloves, and masks and by reducing the possibility of airborne spread of infectious agents from the room into the corridor whenever the door of the isolation room is opened. The anteroom should be under slightly negative pressure with regard to the hall; it is preferable for the anteroom, as well as the isolation room, to have its own supply and exhaust for ventilation air.

The room design of many, especially older, hospitals may not allow for adequate control of air movement; therefore, complete control of droplet nuclei and dust particles is not possible. If proper air-handling capabilities are lacking, a commercially available window fan to exhaust air from the room may be used to control airflow. It is far preferable, however, for the hospital to install permanent ventilation systems in an adequate number of rooms specified for isolation. Window fans, if used, might be installed in rooms of patients admitted with disease spread by the airborne route, such as staphylococcal pneumonia or varicella (chickenpox), and they may be of special utility in improving isolation of patients with pulmonary tuberculosis. (For special precautions necessary with smallpox, *see* Appendix V.) Ultraviolet irradiation of the air in the upper part of the room or use of portable fan units with high-efficiency air filters may also help reduce the number of airborne tubercle bacilli in rooms housing patients with pulmonary tuberculosis.

Whether or not mechanical devices are used for ventilating or filtering air in rooms for Strict, Respiratory, or Protective Isolation, personnel should wear high-efficiency disposable face masks and keep the door closed except for truly necessary entrances and exits.

2. **Gowns**—Individual gown technique is recommended; that is, gowns should be used only once and then discarded in an appropriate receptacle before the user leaves the contaminated area. Supplies of gowns must be readily available outside the patient area when isolation procedures require their use. Sterile gowns may be used in caring for some patients in Protective Isolation; in some other instances, as with extensive burns or extensive wound infections, it may be desirable to use sterile gowns when changing dressings. Clean, freshly laundered or disposable gowns may be used for all other categories.

3. **Masks**—Individual mask technique is recommended. Masks should be used only once. They may become ineffective when moist and should be discarded in an appropriate receptacle before the user leaves the contaminated area. Masks must never be lowered around the neck and then reused. Supplies of masks should be readily available outside the pa-

tient area when isolation procedures require their use. Masks should cover the nose and mouth. The high-efficiency disposable masks are more effective than the standard cotton gauze or paper tissue masks in preventing airborne and droplet spread.

NOTE: **Caps** and **booties** are not necessary in any of the categories of isolation except for the special smallpox precautions (*see* Appendix V). Some institutions may prefer that they be used in Protective Isolation. When used, the cap should cover all scalp hair, and the booties should cover the open ends of trousers. They should be used only once and then packaged for reprocessing or disposal.

4. **Hands—Handwashing before and after contact with each patient is the single most important means of preventing the spread of infection.** Handwashing is mandatory even when gloves are used. In addition, when ministering to a patient, personnel must wash their hands after any contact with excretions (feces, urine, or material soiled therewith) or secretions (from wounds, skin infections, etc.) of the patient before touching that patient again.

Liquid, powder, or bar formulations should be used for handwashing. An antiseptic cleansing agent should be used by personnel caring for newborn infants or patients in isolation. An antiseptic agent should also be used prior to patient instrumentation (placement of intravenous cannulae, urinary catheters, etc.) or before carrying out surgical procedures. If repeated contact with antiseptic soaps or detergents is not tolerated by hospital personnel, non-medicated soap or detergent may be used in situations other than the ones mentioned above. Whatever cleansing agent is used, virgorous scrubbing for at least 15 seconds and thorough rinsing are essential for handwashing to be effective since much of the benefit results from physical removal of contaminants.

Sinks for handwashing should be conveniently available in the vicinity of every patient. It is preferable to have water spigots and soap dispensers operated by knee or foot controls. An adequate supply of liquid, bar, or powdered soap or detergent and paper towels must be maintained. Soap dispensers should be emptied and cleaned routinely and refilled with fresh agent.

5. **Gloves**—Gloves should be used only once and then discarded into an appropriate receptacle before the user leaves the contaminated area. Supplies of gloves should be readily available outside the patient area when isolation procedures require their use. In ministering to a patient, personnel should change to new gloves after direct contact with that patient's excretions or secretions, even if care of that patient is not completed. Disposable single-use gloves (sterile or nonsterile, depending on the specific use) are available and may be used.

The use of gloves is stressed in some categories because even with good handwashing techniques, potentially infectious material may be

left on the hands (for example, under fingernails or rings). Such residue will not be removed without special attention.

6. **Sphygmomanometer and stethoscope**—When indicated, this equipment should be kept in the isolation area for use with the patient throughout his hospitalization. After the patient is discharged, these should be disinfected in the manner appropriate to the etiologic agent that necessitated isolation, as indicated in Appendix VI.

7. **Needles and syringes**—Because of the impossibility of knowing which patients' blood may be contaminated with hepatitis virus or other microorganisms, extreme caution must be applied in handling used needles and syringes whether in isolation or not. Disposable needles and syringes are available and should be used for patients in isolation. They must not be reused. Used needles need not be recapped; they should be placed in a prominently labeled, impervious, puncture-resistant container designated specifically for this purpose. Needles should not be purposely bent, because accidental needle puncture may occur. Used syringes should be placed in an impervious bag. Both of these containers should be incinerated or autoclaved and then discarded. Reusable needles and syringes should be rinsed thoroughly in cold water after use; the needle should be placed in a puncture-resistant rigid container; syringes and needles should be wrapped using double-bag technique and returned for decontamination and sterilization.

8. **Dressings and tissues**—All dressings, paper tissues, and other disposable items soiled by respiratory, oral, or wound secretions must be considered potentially infective and disposed of accordingly even if the patient is not isolated. Disposal may call for single or double disposable bag techniques; bags should be impervious. When removed from patient areas, the bags should be closed, sealed, and placed in a larger disposable bag or container. Ultimate disposal is by incineration or placement in a properly supervised and maintained sanitary landfill. Appropriate disposable bags must always be available at the patient's bedside.

9. **Urine and feces**—Urine and feces should be flushed down the toilet when the hospital uses a municipal or other safe sewage treatment system. A urinal and/or bedpan if needed should be issued to and used by only 1 patient until decontaminated and resterilized. Autoclaving is the most reliable decontamination system. Steam hoppers do not sterilize these utensils and may even create bacterial or viral aerosols. Disposable urinals and bedpans are available and may be used for patients in isolation. They should be disposed of in the same manner as dressings and paper tissues.

10. **Thermometers**—Special precautions with nondisposable thermometers are needed for certain categories of isolation. In these instances, the thermometer should remain in the patient's room in a container with disinfectant (70%-90% ethyl or isopropyl alcohol with 0.2% iodine).

Every 3 days the disinfectant should be flushed down the toilet and the container should be washed, dried, and refilled. Before and after use, thermometers should be rinsed in cold water. Oral thermometers may be kept dry; before each use, they should be washed with soap and water and wiped with 70%-90% alcohol. Upon discharge of the patient, non-disposable thermometers should be wrapped and sent to Central Supply for sterilization.

11. **Linen**—All mattresses and pillows for patients in isolation should be covered with impervious plastic. The double-bag technique should be used when removing linen and other contaminated articles from rooms of patients in isolation. The articles are placed in a clean bag in the contaminated area; that bag is closed tight and then placed in a second clean bag, preferably of a different color, which is held by a person or supported by a hamper outside the patient's room. The bag is closed or stapled tight and labeled "CONTAMINATED" or "ISOLATION" so that whoever receives this material can take the necessary precautions to protect himself. If the inner bag is made of plastic that is hot-water-soluble, handling of these potentially contaminated linens is reduced. If water-soluble bags cannot be used, linen should be carefully put in the washing machine unsorted; the bags must also be washed. Disposable linens are available and can be used for patients in isolation.

12. **Dishes**—Disposable dishes and utensils are available and can be used for patients in isolation.

13. **Drinking water**—no special precautions necessary.

14. **Clothing and personal effects**—no special precautions except in Strict Isolation, Enteric Precautions, and Wound and Skin Precautions. (*see* Appendix III).

15. **Laboratory specimens**—When double-bag technique is necessary for transporting specimens, use transparent bags so contents can be seen and handled appropriately.

16. **Books, magazines, money, letters, and toys**—In general, any of these articles visibly soiled with potentially infective excretions or secretions should be disinfected or destroyed. Special precautions with smallpox are given in Appendix V.

17. **Patient's chart**—Under Strict Isolation, the chart should not be taken into the isolation room.

18. **Visitors**—Visitors should be kept to a minimum since they may become infected. In all instances, visitors should see a floor nurse before entering the isolation area and be instructed in the use of gown, mask, gloves, etc. In general, children should not be allowed to visit patients in isolation.

19. **Transporting patients**—Patients should be taken out of their isolation area *only* for essential purposes. Appropriate barriers (masks, impervious dressings, etc.) to prevent disease transmission should be pro-

vided for the entire period the patient is out of the isolation area. The area to which the patient is to be taken should be notified of his impending arrival and the techniques to be applied to prevent spread of infection. If appropriate, the patient should be alerted to the potential spread of his disease and informed as to how he can assist in maintaining a barrier against the transmission of his infection to others.

20. **Concurrent cleaning**—In addition to the special precautions mentioned in each section, cleaning equipment must be disinfected at the end of each cleaning shift. For example, wiping cloths and mop heads should be laundered and thoroughly dried, dirty water discarded, and buckets disinfected before being refilled.

21. **Terminal cleaning**—Terminal cleaning of isolation rooms (or areas) consists of the following general actions in addition to any specific measures listed in the individual section. Germicidal detergent solution should be freshly prepared.

a. All receptacles (drainage bottles, urinals, bedpans, flowmeter jars, thermometer holders, etc.) should be emptied, wrapped or marked (if indicated), and returned to Central Supply.

b. All disposable items should be discarded in a wastebasket lined with an impervious plastic bag.

c. All equipment that cannot be best handled by Central Supply or discarded should be washed with a germicidal detergent solution.

d. All furniture and mattress covers should be washed with a germicidal detergent solution.

e. All floors should be wet-vacuumed. If wet-vacuuming equipment is not available, floors should be mopped with a germicidal detergent solution using a double-bucket technique.

f. Grossly soiled areas on walls should be washed with a germicidal detergent solution.

g. Disinfectant fogging should *not* be used; it is an unsatisfactory method of decontaminating air or surfaces.

h. Airing a room from which a patient has been discharged is not an effective terminal disinfection procedure and is not necessary (except for a smallpox patient's vacated room, *see* Appendix V). The only exception, as noted in Strict Isolation and Respiratory Isolation, is that if the room does not have an adequate artificial ventilation system or functioning exhaust fan, a 1- to 2-hour airing period with windows open and doors closed may be indicated *before* terminal cleaning.

22. **Special instruments**—If possible, instruments should be returned to be disinfected or sterilized; they should be either single- or double-bagged and marked before they leave the patient's area. All reusable breathing circuits and humidification devices used with inhalation therapy equipment should be wrapped and returned to Central Supply for reprocessing.

23. **Special procedure trays**—Trays should be separated into component parts and handled as indicated.

24. **Miscellaneous**—

a. **Isolation carts**—Some institutions use special isolation carts pre-stocked with all necesssary equipment for all classes of isolation, or separate isolation carts for each class of isolation. These can be wheeled to the area where a patient in isolation is located. They must be cleaned frequently and kept adequately stocked with all necessary supplies.

b. **Disposable equipment**—A variety of disposable equipment is available and should be considered for patients in isolation. Use of these disposable articles reduces the possibility of equipment's serving as a vehicle for spread of infection and may reduce hospital costs related to disinfecting and further processing of the equipment. However, adequate and safe means of disposal must be furnished.

B. TECHNIQUES

There are some general techniques that do not fit in any of the above specifications but deserve mention.

1. **Admission**—A history of a susceptible person's having been exposed recently to an infectious disease requiring isolation should prompt the physician to postpone elective admission or prescribe appropriate isolation of a non-elective admission. This situation is most likely to occur with pediatric patients.

2. **Prophylaxis and immunization**—Prophylactic antimicrobials and active or passive immunization may prevent or ameliorate the course of disease to which patients or personnel have been exposed, and these measures should be considered as adjuncts to isolation in the prevention of the spread of disease. For example, persons with *direct* and *intimate* exposure to untreated meningococcal disease may be candidates for antimicrobial prophylaxis, persons with exposure to a suspected or confirmed case of smallpox should receive smallpox vaccine as well as immune serum globulin (ISG or gamma globulin), and persons with close direct exposure to hepatitis A should be given ISG. Furthermore, as noted below, routine vaccination of personnel against selected diseases that may be spread in the hospital should be undertaken.

3. **Space**—Neonates with clinical infections that require isolation must be removed promptly from the regular nursery, unless they are appropriately isolated in the unit. Self-contained isolettes or incubators provide limited protection against droplet and droplet nuclei transmission but do not prevent direct contact spread. Therefore, neonates who have diseases that require Strict Isolation or that are spread by the direct contact route must be isolated in a manner designed to prevent such spread. Children or adults with illnesses caused by the same organism may be kept in the same room or ward. In some instances, it is wise

to separate the susceptibles, whether patients or hospital personnel, from infected patients: Patients with the common childhood diseases (mumps, varicella, etc.) should be separated from susceptibles. Patients with vaccinia should be separated from patients receiving immunosuppressives or with eczema, burns, and other skin problems. Patients with rubella (including infants with the congenital rubella syndrome) should be separated from susceptible female staff members who may be in early pregnancy.

A private room may be desirable even though not required for some patients. For example, the preferred method of caring for a patient with tetanus is to put him in a private room to ensure a quiet environment. Furthermore, where room specifications allow an infected patient to share a room with noninfected patients, it is assumed that all ancillary measures to prevent the spread of infection will be carried out. For example, a patient requiring Enteric Precautions may be in a room with others as long as he is cooperative, has no direct contact with roommates, washes his hands scrupulously, and does not have such severe diarrhea or fecal incontinence that either roommates or objects used by them become contaminated, and also as long as personnel have proper facilities and sufficient training to ensure adequate handwashing and decontamination of soiled fomites. When these obligations cannot be met, a private room is advisable.

4. **Cultures**—Infected sites should be cultured promptly to confirm the diagnosis and to allow antibiotic susceptibility patterns to be determined. A gram-stain examination of the discharge from any infection gives an initial impression of the etiology of that infection. When bacteriologic culture data are used along with clinical recovery as criteria for terminating isolation, the negative cultures must be of samples obtained after discontinuation of antibiotic therapy.

5. **Dressings**—Dressing techniques can be classified as *special* or *standard,* depending on the nature of the infected wound or lesion. The following table outlines the features of each.

The Special Dressing Technique should be used for all wound or skin infections with excessive purulent drainage regardless of etiology. In addition, wounds with gas gangrene, diphtheria, or staphylococcal or streptococcal infection, as well as the others listed in the Strict and Wound & Skin categories, should be dressed with the Special Dressing Technique. All other infected wounds and lesions should be handled with the Standard Dressing Technique and are grouped under Secretion Precautions—Lesions.

Some hospitals use occlusive dressings and may also cover them with gauze containing an ointment to inhibit the dispersion of bacteria from the wound, especially on those infections in the Wound & Skin Precautions category.

DRESSING TECHNIQUES

	Special	Standard
Handwashing before and after	+	+
Gloves (2 sets)*	+	0
Gown**	+	0
Mask	+	0
Sterile equipment	+	+
Double-bag technique for soiled dressings and equipment	+	+
No-touch technique†	+	+

\+ Necessary

0 Not Necessary

* Changed between removal of soiled dressing and application of new dressing.

** Need not be sterile, unless advisable to prevent cross-infection of extensive wounds.

† Hands must not touch wound or dressing.

6. **Dressing cart**—If a dressing cart is used, it takes at least 2 people to make dressing changes: 1 person handles clean supplies, and the other handles contaminated material. The dressing cart should not be taken into an isolation room. Use of disposable equipment is encouraged.

C. RESPONSIBILITIES

Each hospital must have an active, effective, responsible **infections committee** representative of the hospital staff (*see* Accreditation Manual for Hospitals. Chicago, Joint Commission on Accreditation of Hospitals, 1975). This committee should develop an isolation policy for the hospital, promote its proper use, and enforce its implementation. When appropriate, the committee should consider modifications or additions to the policy.

Another integral part of the responsibility of the infections committee is the development and maintenance of a surveillance program for nosocomial infections. Two key staff positions that are relevant to implementation of both the isolation policy and the surveillance program are those of **hospital epidemiologist** and **infection control nurse.** Both can play an important role in implementing an effective isolation policy. The epidemiologist, who is usually a physician, consults with the medical staff and supervises proper isolation techniques, and the infection control nurse is responsible for training hospital personnel in proper isolation techniques and providing consultation for nurses and other personnel on problems associated with isolation.

Each **physician** is responsible for placing his or her patient in isolation to protect the patient or prevent the spread of infection. The physician must observe at all times the proper procedures associated with the type of isolation stipulated for the patient; *physicians must teach by example.*

The hospital is responsible for assuring that patients are appropriately isolated, and each hospital should establish clearly, as a matter of policy, who has the ultimate authority to make decisions regarding isolation. Authority may be delegated to the chairman of the infections committee, the hospital epidemiologist, the infection control nurse, or a member of the administrative staff. In some hospitals, the nurse in charge is given the authority to isolate a patient suspected of having a communicable disease if the physician neglects to do so or is not available. However, the patient's physician must be notified as soon as possible when isolation of a patient is ordered by someone else.

Under the card system, the exact isolation technique for the diagnosed illness can be determined by the **charge nurse** from information on the cards. It is the responsibility of the nurse to display the appropriate card conspicuously in the immediate vicinity of the isolated patient (on the door, foot of the bed, etc.). A duplicate card may also be attached to the front of the patient's chart. All necessary equipment should be obtained and placed in easily accessible locations. The nurse should inform the appropriate hospital personnel, such as the infection control nurse and/or the hospital epidemiologist, of the patient's being placed in isolation.

An **employee health program** stressing the need for and requiring receipt of certain routine immunizations by personnel, including physicians, should be developed and supervised by the infections committee. Immunization records should be maintained by the personnel health service or a person designated for this assignment. Smallpox vaccinations and revaccinations should be included in this program because of the special risks of this disease for hospital personnel. Additionally, consideration should be given to including immunizations against measles (rubeola), rubella (German measles), poliomyelitis, diphtheria, tetanus, and influenza.

Every hospital should have an employee tuberculosis surveillance program; the specifics will vary according to the dimensions of the tuberculosis problem. The hospital should provide for tuberculin skin testing all employees at the time of hiring and take a chest X-ray of those who have a positive reaction to the skin test—to develop a baseline of information. The hospital should provide preventive treatment for employees with positive skin tests unless specifically contraindicated—to prevent them from developing disease and infecting others. Policies for repeating skin tests should be determined by the risk of acquiring a new infection. (Center for Disease Control: Guidelines for Prevention of TB

Transmission in Hospitals. Atlanta, CDC, 1974.) Groups such as health workers who may be at particular risk of exposure to unrecognized pulmonary tuberculosis should, where possible, be kept under surveillance for evidence of newly acquired tuberculous infection. It must be recognized that only the occurrence of new infections reflects whether transmission is actually occurring. (PHS Advisory Committee on Immunization Practices: BCG Vaccines. Morbidity and Mortality Weekly Report 24:69, 22 Feb 1975.)

It is also within the purview of the infections committee to review the microbiologic safety of laboratories and other high-risk areas, to establish surveillance for personnel illness in such areas, and to work with other groups within the institution to minimize the risk to personnel of acquiring nosocomial infections.

Everyone—including physicians, medical students, members of the housekeeping staff, nurses, and technicians—is responsible for complying with isolation procedures and for tactfully calling observed infractions to the attention of offenders.

Each **patient** also has responsibilities relating to prevention of spread of infections, and these must be brought to his attention by his physician and the head nurse on the floor. These responsibilities will be noted in each section, but 1 general and important patient responsibility is that of frequent handwashing.

The responsibilities of the **hospital staff** cannot be effectively dictated, but must arise from a personal sense of responsibility. Every member has an important role to play; the preceptor has as much to contribute to the prevention of spread of infections as the aide who works on the ward. There must be avid attention to details, continuous education and re-education, active surveillance, and constant awareness of the problems of infection control.

Infractions of the isolation protocol by some are sufficient to negate the conscientious efforts of others. "The chain is no stronger than its weakest link."

—NOTES—

Strict Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary*; door must be kept closed.
2. Gowns—must be worn by all persons entering room.
3. Masks—must be worn by all persons entering room.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons entering room.
6. Articles—must be discarded, or wrapped before being sent to Central Supply for disinfection or sterilization.

Diseases Requiring Strict Isolation*

Anthrax, inhalation

Burn wound, major, infected with *Staphylococcus aureus* or group A streptococcus

Congenital rubella syndrome

Diphtheria (pharyngeal or cutaneous)

Disseminated neonatal *Herpesvirus hominis* (herpes simplex)

Herpes zoster, disseminated

Lassa fever

Marburg virus disease

Plague, pneumonic

Pneumonia, *Staphylococcus aureus* or group A streptococcus

Rabies

Skin infection, major, infected with *Staphylococcus aureus* or group A streptococcus

Smallpox

Vaccinia (generalized and progressive and eczema vaccinatum)

Varicella (chickenpox)

*See "Isolation Techniques for Use in Hospitals" for details and recommended duration of isolation.

Strict Isolation

A. **PURPOSE**

To prevent the transmission of all highly communicable diseases that are spread by both contact and airborne routes of transmission.

B. **GENERAL COMMENTS**

1. A private room, gowns, masks, and proper handwashing are essential minimal requirements for practicing proper Strict Isolation.

2. Visitors, equipment, and furniture should be kept to a minimum in the isolation room.

3. Personnel who provide care for patients with diphtheria, rubella, and smallpox should be immune either by having had the disease or by maintaining up-to-date vaccination status against these diseases.

4. When a patient with known or suspected rabies is admitted, all personnel who may have contact with the patient should be alerted to the potential dangers. If there is a break in technique and a chance that the patient's saliva has passed the skin barrier of a contact, the involved skin area should immediately be vigorously scrubbed with soap and water, thoroughly rinsed, and then scrubbed with a 1% (w/v) aqueous solution of benzalkonium chloride. (Aqueous benzalkonium chloride or chemically similar antiseptics should be formulated with sterile technique and dispensed in single-use containers.) Additionally, the exposed person should be given passive immunization with rabies hyperimmune serum and active immunization with rabies vaccine according to recommended schedules (*see* Public Health Service Advisory Committee on Immunization Practices: Collected Recommendations, available from the Center for Disease Control, Atlanta, Ga. 30333).

5. For patients with known or suspected smallpox, *see* Specifications below and additional precautions described in Appendix V.

6. Strict Isolation is recommended for skin, burn, and other wound infections caused by *S. aureus* and group A streptococci when a) purulent drainage is not adequately contained by dressings, i.e., drainage is sufficiently copious to saturate the external, exposed parts of dressings despite dressing changes at usual intervals, or b) dressings are not used, such as occurs with the "open" treatment of burns or with infected extensive dermatologic conditions (eczema, psoriasis, etc.). In contrast, all skin, burn, and other wound infections caused by common gram-negative nosocomial bacteria (*E. coli,* klebsiella, enterobacter, serratia, proteus, pseudomonas) are isolated as indicated in Wound & Skin Precautions. The differences between these 2 groups of organisms in

how they are handled derive from differences in communicability. The above-mentioned gram-negative organisms are spread primarily from patient to patient by hands of personnel, and they pose little hazard to these persons or their healthy community contacts. *S. aureus* and group A streptococci are also transmitted by this (and airborne or droplet) means. Acquisition of these organisms may also result in clinical illness in otherwise healthy persons or result in an asymptomatic carrier state, most commonly in the upper respiratory tract, and then subsequently spread from this site to other patients as well as community contacts of hospital personnel.

C. DISEASES AND DURATION OF ISOLATION

1. **Anthrax, inhalation**—for duration of illness.

2. **Burn wound, major,** infected with *Staphylococcus aureus* or group A streptococcus, when the infected area is too large to cover with dressings, or when dressings do not adequately contain the purulent drainage —for duration of illness. For burn wounds infected with other microorganisms, *see* Wound & Skin Precautions, Secretion Precautions—Lesions, and Appendix IV. *See also* Table 1, p. 7.

3. **Congenital rubella syndrome**—for duration of hospitalization. An infant born with the congenital rubella syndrome should be isolated on any subsequent admissions up to the age of 1 year. (*See also* rubella, Respiratory Isolation, p. 42.)

4. **Diphtheria (pharyngeal or cutaneous)**—until 2 cultures (obtained from both nose and throat as well as cutaneous lesions if present) taken at least 24 hours apart after cessation of antimicrobial therapy are negative for *Corynebacterium diphtheriae.*

5. **Disseminated neonatal *Herpesvirus hominis* (herpes simplex)**—for duration of illness.

6. **Herpes zoster, disseminated**—for duration of illness. This disease is probably transmitted primarily by the contact route but may also be transmitted by the airborne route; if there is no possibility of spread to other patients who are immunosuppressed, disseminated herpes zoster may be handled with Wound & Skin Precautions.

7. **Lassa fever**—for duration of illness.

8. **Marburg virus disease**—for duration of illness.

9. **Plague, pneumonic**—until culture-negative after cessation of antimicrobial therapy.

10. **Pneumonia, *Staphylococcus aureus***—for duration of illness.

11. **Pneumonia, group A streptococcus**—until 24 hours after start of effective therapy.

12. **Rabies**—for duration of illness.

13. **Skin infections, major,** infected with *Staphylococcus aureus* or group A streptococcus and not covered or not adequately contained by

dressings—for duration of illness. For skin infections caused by other microorganisms, *see* Wound & Skin Precautions and Secretion Precautions—Lesions.

14. **Smallpox**—until all crusts are shed (*see* Appendix V).

15. **Vaccinia** (generalized and progressive and eczema vaccinatum)—for duration of illness.

16. **Varicella (chickenpox)**—for 7 days after the first crop of vesicles appears. Additionally, an asymptomatic patient who has been exposed to varicella and who must be hospitalized should be isolated until 3 weeks after the exposure.

D. **SPECIFICATIONS**

1. **Room**—A private room with air control, handwashing facilities, and connecting toilet (including bathing) facilities is required. A connecting anteroom is desirable. Doors must be kept closed. Patients with the same disease can be assigned to the same room.

2. **Gowns**—Individual gown technique is imperative for all persons entering the room.

3. **Masks**—must be worn by all persons entering the room.

4. **Hands**—must be washed with antiseptic soap or detergent and water by all personnel before entering, after leaving, and as otherwise indicated during patient care.

5. **Gloves**—must be put on routinely by all personnel before entering and kept on until discarded in a receptacle before leaving the room.

6. **Sphygmomanometer and stethoscope**—should be requisitioned and retained in the isolation room until termination of isolation, then disinfected in Central Supply.*

7. **Needles and syringes**—Disposable needles and syringes are available and should be used for patients in isolation. They must not be reused. Used needles need not be recapped; they should be placed in a prominently labeled, impervious, puncture-resistant container designated specifically for this purpose. Needles should not be purposely bent, because accidental needle puncture may occur. Used syringes should be placed in an impervious bag. Both of these containers should be incinerated, or autoclaved before discarding. Reusable needles and syringes should be rinsed thoroughly in cold water after use; the needle should be placed in a puncture-resistant rigid container; syringes and needles should be wrapped using double-bag technique and returned for decontamination and sterilization.

8. **Dressings and tissues**—

a. must be placed in an impervious plastic or paper bag and closed securely.

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*For a list of recommendations for chemical disinfection, *see* Appendix VI.

b. Bags should be readily available for disposal of tissues at the patient's bedside.

c. These bags should be placed in a wastebasket lined with an impervious plastic bag in the room. Removal from the room requires double-bag technique. All such bags should be incinerated without being opened.

9. **Urine and feces**—should be flushed down the toilet. If a portable urinal, bedpan, or commode is used, it should be emptied into toilet, cleaned, and replaced at bedside. When toilet facilities are not available in the isolation room, provision must be made for the practical and effective disposal of excretions into the regular sewerage system without exposing others to any hazard.

10. **Thermometers**—The thermometer and container with disinfectant (70%-90% ethyl or isopropyl alcohol with 0.2% iodine) should remain in the room, with disinfectant changed every 3 days. Oral thermometers may be kept dry; before and after each use, they should be washed with soap and water and wiped with 70%-90% alcohol. Upon termination of isolation, disinfectant should be discarded, and the thermometer and container should be double-bagged and returned for sterilization.

11. **Linen**—

a. Vigorous movements when changing linen should be avoided to prevent aerosols of microorganisms.

b. Used linen should be put in a laundry bag (clearly marked for isolation usage) in the patient's room or adjacent to the patient's bed. A hot-water-soluble bag is preferable.

c. The water-soluble bags containing contaminated linen should be placed, unopened, in hospital washing machines. Bags that are insoluble must be opened and the contents carefully dumped into washing machines without sorting; the bags must also be washed.

d. Mattresses and pillows should be covered with impervious plastic. This plastic covering should be cleaned with a germicidal detergent solution or removed with the linens and laundered at the time of terminal disinfection.

12. **Dishes**—

a. Disposable dishes, water glasses, and carafes are preferred, but reusable ones may be used.

b. Leftover food should be wrapped and discarded in wastebaskets.

c. Liquids should be poured down the sink drain or toilet if located within the room or adjoining bathroom.

d. Utensils and trays should be put in clean impervious bags, using double-bag technique, which should be labeled "CONTAMINATED" or "ISOLATION" and sent to the kitchen on the regular dietary cart.

e. Dishwashing personnel must wear gloves when handling contaminated articles. Personnel who wash dirty dishes should wash hands thoroughly before handling clean dishes.

13. **Drinking water**—no special precautions.

14. **Clothing and personal effects**—should, if possible, be laundered or sterilized with gaseous ethylene oxide before being sent home. If not possible, clothing should be double-bagged to be sent home for washing. (*See* Appendix III for home-laundering instructions.)

15. **Laboratory specimens**—

a. Specimens (urine, sputum, stool, blood, etc.) should be put in a sterile labeled container with the lid securely closed.

b. Each container should then be placed in transparent bags using double-bag technique and sent to the laboratory.

c. All containers should be labeled "CONTAMINATED" or "ISOLATION" to warn laboratory personnel of potential danger.

16. **Books, magazines, money, letters, and toys**—no special precautions except with those articles soiled with the patient's secretions; they should be disinfected or destroyed. (*See also* Smallpox, Appendix V.)

17. **Patient's chart**—

a. must be kept outside the isolation room at all times. Pertinent information obtained in the room (i.e., vital signs) should be recorded on a sheet of paper, which is destroyed after the information has been transcribed onto the patient's permanent record.

b. Disposable writing equipment should be readily available in each room.

18. **Visitors**—

a. Immediate family only.

b. Only 2 visitors at a time.

c. The nursing service should instruct visitors in gown, mask, and glove techniques.

d. A nurse should instruct visitors on the necessity for strict adherence to isolation procedures.

19. **Transporting patients**—

a. The service to which a patient is going should be notified that he is infected with a highly communicable disease.

b. The patient should wear a clean isolation gown (long length and sleeves).

c. A clean cotton blanket on the stretcher or wheelchair should be wrapped around the patient, leaving his face exposed and keeping the outside of the blanket from becoming contaminated.

d. The patient should wear a high-efficiency disposable mask. Persons transporting him should wear a gown and mask if they will have direct contact with the patient. A Strict Isolation card should be attached to the stretcher or wheelchair so that the necessary isolation

instructions are brought to the attention of X-ray or laboratory technicians, or others who may have contact with the patient.

e. Patients should not be transported except in case of utmost necessity, such as for surgery. The possible difficulties with using portable X-ray equipment (obtaining quality roentgenograms and disinfecting the equipment) must be balanced against the precautions to be taken in moving patients in Strict Isolation to the X-ray department. X-ray and laboratory procedures that are not essential for the immediate care of the patient should be postponed until the patient is removed from isolation.

20. **Concurrent cleaning**—Routine daily cleaning procedures as used in other hospital rooms should be used in the isolation room. The cleaning personnel must be alerted to the potential hazards and carefully instructed as to proper precautions and protective clothing to be used when working in a Strict Isolation room. Cleaning may be done at any time during the routine daily cleaning cycle if the following guidelines are followed *after* cleaning a Strict Isolation room:

a. Wiping cloths must be discarded in a receptacle in the room.

b. All cleaning equipment must be disinfected in the room.

c. Mop heads must be double-bagged and then laundered and thoroughly dried.

d. Dirty water must be discarded, and the bucket disinfected in the room.

21. **Terminal disinfection**—general procedures as listed in the Introduction, plus

a. Housekeeping personnel must wear gowns and masks.

b. If the room has good artificial ventilation or functioning exhaust fan, airborne contaminants will be removed, and terminal disinfection can be carried out as soon as the patient leaves. Otherwise, an airing period of 1-2 hours with the windows open and the doors closed may be indicated prior to terminal cleaning.

c. All receptacles (drainage bottles, urinals, bedpans, flowmeter jars, thermometer holders, etc.) should be emptied, double-bagged, labeled "CONTAMINATED" or "ISOLATION," and sent to Central Supply for decontamination and disinfection or sterilization.

d. All disposable items, including toilet tissue, soap, plastic tubing, gloves, etc., should be discarded in a wastebasket lined with an impervious plastic bag.

e. After wet-mopping the floor, mop heads should be double-bagged and sent to the laundry.

22. **Special instruments** (cystoscopes, proctoscopes, nebulizers, IPPB machines, etc.)—Removable and easily handled parts should be double-bagged and sent to be decontaminated and disinfected or sterilized.

Other parts should be wiped with a germicidal detergent solution and sent for further decontamination.

23. **Special procedure trays** (tracheostomy, lumbar puncture, cut-down trays, etc.)—All material on the tray should be separated into a. *disposable,* b. *autoclavable,* c. *linen,* etc., and handled according to instructions under paragraphs 7, 8, 11, and 22, above.

—NOTES—

Respiratory Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary*; door must be kept closed.
2. Gowns—not necessary.
3. Masks—must be worn by any person entering room unless that person is not susceptible to the disease.
4. Hands—must be washed on entering and leaving room.
5. Gloves—not necessary.
6. Articles—those contaminated with secretions must be disinfected.

Diseases Requiring Respiratory Isolation*

Measles (rubeola)

Meningococcal meningitis

Meningococcemia

Mumps

Pertussis (whooping cough)

Rubella (German measles)

Tuberculosis, pulmonary (including tuberculosis of the respiratory tract)—suspected or sputum-positive (smear)

*See "Isolation Techniques for Use in Hospitals" for details and recommended duration of isolation.

Respiratory Isolation

A. PURPOSE

To prevent transmission of organisms by means of direct contact or droplets that are coughed, sneezed, or breathed into the environment. With tuberculosis,* prevention of spread by means of airborne droplet nuclei is also necessary. Also, some of the organisms responsible for illnesses listed in the category (specifically measles and rubella) are infrequently spread by indirect contact, i.e., with freshly contaminated articles. Hands are not usually a vehicle of spread but should be washed appropriately.

B. GENERAL COMMENTS

1. Use of a private room (with air control for tuberculosis), proper handwashing, Secretion Precautions when indicated, and masks is sufficient to prevent transmission in this category of isolation.

2. Diseases referred to as "childhood diseases" are covered in this category of isolation. They occasionally occur in adults.

3. Unless vaccination is otherwise contraindicated, personnel working in this unit who have not had mumps, measles (rubeola), and rubella (German measles) should be vaccinated and given the recommended booster inoculations to maintain protective immunization status.

4. Special attention should be given to preventing pregnant staff members who are susceptible to rubella from working in the newborn nursery because of the possibility of unknown exposure to a newborn infant with rubella infection. Such exposure can result in infection of the fetus with or without clinical disease in the woman.

C. DISEASES AND DURATION OF ISOLATION

1. **Measles (rubeola)**—for 4 days after onset of rash.

2. **Meningococcal meningitis**—until 24 hours after start of effective therapy.

3. **Meningococcemia**—until 24 hours after start of effective therapy.

4. **Mumps**—for 9 days after onset of swelling.

5. **Pertussis (whooping cough)**—for 7 days after start of therapy with either erythromycin or ampicillin; if no therapy is given, isolate for 3 weeks after onset of paroxysms.

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*For a more detailed set of guidelines on preventing transmission of tuberculosis in hospitals, write the Center for Disease Control, Attn: Tuberculosis Control Division, Bureau of State Services, Atlanta, Ga. 30333, or refer to CDC: Guidelines for Prevention of TB Transmission in Hospitals. Atlanta, 1974.

6. **Rubella (German measles)**—for 5 days after onset of rash (for congenital rubella syndrome, *see* Strict Isolation).

7. **Tuberculosis, pulmonary (including tuberculosis of the respiratory tract),** suspected or sputum-positive (smear)—Usually within 2 to 3 weeks after the patient is started on effective therapy, infectivity of respiratory secretions will have diminished enough for the patient to be removed from isolation. Currently, there are no quantitative criteria to document this. However, by then there should be a clinical response to therapy with decreases in coughing, production of sputum, and fever. These clinical signs as well as declining numbers of acid-fast bacilli in sputum smears can be used as a guide. If tuberculosis is suspected, isolate until direct examination of sputum has been completed. Cases of retreatment tuberculosis (patients who need a second course of therapy) frequently have drug-resistant strains and should be individually isolated until there is evidence of clinical response. The patient should be instructed to cover his mouth with tissues when coughing or sneezing. The patient should also be instructed in proper handling of oral secretions; that is, he should cough or spit into tissues held close to his mouth and then discard them in an impervious bag at his bedside. The patient should wear a mask when out of his room, unless he covers his nose and mouth when coughing. An unconscious patient with pulmonary disease of unknown etiology should be managed as a case of pulmonary tuberculosis until proven otherwise. If the room ventilation meets the requirements outlined in General Principles, (*see* p. 17), then masks for personnel entering the room are optional.

If ventilation of the isolation room in which patients with sputum-positive pulmonary tuberculosis are housed cannot be handled so that persons in the corridor or in adjacent rooms are protected from exposure, an appropriate window exhaust fan should be installed so room air will be discharged directly to the outside.

D. **SPECIFICATIONS**

1. **Private room**—required (with air control for tuberculosis); a connecting anteroom is desirable. Every reasonable effort should be made to use a room with sink, bathtub, and toilet. Patients with the same disease can be assigned to the same room. For drug-resistant tuberculosis, *see* above.

2. **Gowns**—not necessary.

3. **Masks**—must be worn by all persons entering the room unless person entering is not susceptible to the disease.

4. **Hands**—must be washed with antiseptic soap or detergent and water on entering and on leaving the room, and as otherwise indicated during patient care.

5. **Gloves**—not necessary.

6. **Sphygmomanometer and stethoscope**—no special precautions.

7. **Needles and syringes**—no special precautions.

8. **Dressings and tissues**—should be discarded in impervious plastic or paper bags, which should be closed securely and put in a wastebasket lined with an impervious plastic bag, within the room. Upon removal, the wastebasket liner should be sealed and incinerated without being opened, or deposited in a sanitary landfill.

9. **Urine and feces**—no special precautions.

10. **Thermometers**—no special precautions.

11. **Linen**—no special precautions.

12. **Dishes**—no special precautions.

13. **Drinking water**—no special precautions.

14. **Clothing and personal effects**—no special precautions.

15. **Laboratory specimens**—Sputum specimens from patients with pulmonary tuberculosis should be handled with care; an impervious sputum container with a tight fitting lid should be used; it should be appropriately labeled to alert the laboratory personnel.

16. **Books, magazines, money, letters, and toys**—no special precautions.

17. **Patient's chart**—no special precautions.

18. **Visitors**—

a. Immediate family only.

b. Only 2 visitors at a time.

c. The nursing service should instruct visitors in the wearing of masks, if masks are indicated, and on the necessity for strict adherence to isolation.

19. **Transporting patients**—

a. The service to which a patient is going should be notified that he is infected with a communicable disease.

b. The patient should wear a high-efficiency disposable mask; however, a tuberculosis patient who covers his nose and mouth when coughing need not wear a mask. Persons transporting these patients need not wear mask or gown.

20. **Concurrent cleaning**—Routine daily cleaning procedures as used in other hospital rooms should be used in the isolation room. The cleaning personnel must be alerted to the potential hazards and carefully instructed as to proper precautions, including the use of masks as indicated, to take when working in a Respiratory Isolation room.

21. **Terminal disinfection**—General procedure as listed in Introduction. If the room has good artificial ventilation or a functioning exhaust fan, airborne contaminants will be removed, and terminal disinfection can be carried out as soon as the patient leaves. Otherwise, an airing period of 1-2 hours with the windows open and the doors closed may be indicated prior to terminal cleaning.

22. **Special instruments**—All reusable breathing circuits and humidification devices used with inhalation therapy equipment should be wrapped and returned to Central Supply for reprocessing.

23. **Special procedure trays**—no special precautions.

—NOTES—

Protective Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary*: door must be kept closed.
2. Gowns—must be worn by all persons entering room.
3. Masks—must be worn by all persons entering room.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons having direct contact with patient.
6. Articles—*see* manual text.

Conditions That May Require Protective Isolation*

Agranulocytosis

Dermatitis, noninfected vesicular, bullous, or eczematous disease when severe and extensive

Extensive, noninfected burns in certain patients

Lymphomas and leukemia in certain patients (especially in the late stages of Hodgkin's disease and acute leukemia)

*See "Isolation Techniques for Use in Hospitals" for details and recommended duration of isolation.

Protective Isolation

A. **PURPOSE**

To prevent contact between potentially pathogenic microorganisms (including commensal microorganisms) and uninfected persons who have seriously impaired resistance.

B. **GENERAL COMMENTS**

1. Patients with certain diseases (leukemia, lymphomas, etc.) on certain therapeutic regimens (total body irradiation, steroid or antimetabolite therapy, etc.) are significantly more susceptible to infections than other patients and thus may benefit from an attempt to reduce contact with microorganisms. Patients with other conditions in which host defenses are severely compromised may also benefit from this protection. Handwashing and use of gloves and masks are not sufficient to accomplish this goal. Protective Isolation considers both host and transmission factors.

2. A patient should not be placed in Protective Isolation automatically, but must have the isolation ordered by the patient's physician. The decision to place a patient in Protective Isolation often depends on clinical judgment, thus categorization of diseases requiring this form of isolation can only be considered to be a rough guide. Factors such as total polymorphonuclear leukocyte count, stage of the underlying disease, etc., must be considered.

3. Procedures, such as urethral catheterization, that usually are not associated with fatal complications can result in a fatal infection in persons with impaired resistance and should be avoided if possible.

4. The air in the Protective Isolation room should be under slightly positive pressure with respect to the hall; that is, air flow should be from the Protective Isolation room into the corridor. Air should not be recirculated from other hospital areas unless it has been filtered through a high-efficiency filter. It may be necessary to make structural and mechanical modifications in the room to establish these conditions. Doors must be kept closed.

5. Preliminary data suggest that vigorous efforts to exclude all microorganisms by using patient-isolator units, eradicating endogenous flora, and sterilizing food, water, and fomites may prevent or delay onset of some infections; thus these procedures have been recommended by some for use with very-high-risk patients who have a predictable temporary period of high susceptibility. However, these more vigorous precautions do not appear warranted at this time for most patients.

C. CONDITIONS FOR WHICH PROTECTIVE ISOLATION MAY BE INDICATED AND DURATION OF ISOLATION

1. **Agranulocytosis**—until remission.

2. **Burns,** extensive, noninfected, in certain patients—until substantial healing of skin surface.

3. **Immunosuppressive therapy** in certain patients—until host defenses are judged adequate.

4. **Lymphomas** and **leukemia** in certain patients (especially in the late stages of Hodgkin's disease and acute leukemia)—until there is substantial clinical improvement.

5. **Dermatitis,** noninfected vesicular, bullous, or eczematous disease when severe and extensive—until substantial healing of skin surface.

This is not meant to be a complete listing, but it includes some of the diseases and conditions usually considered grounds for Protective Isolation.

D. SPECIFICATIONS

The degree to which sterility of certain items needs to be assured depends upon the level of protection required. The techniques specified below suffice for "usual" types of Protective Isolation.

1. **Private room**—required.

2. **Gowns**—Clean, freshly laundered gowns should be worn by all persons entering the room. Sterile gowns may be of added value with highly selected patients. Individual gown technique should be used.

3. **Masks**—should be worn by all persons entering the room. A mask must cover the mouth and nose, and once it is removed it is considered contaminated and must be discarded.

NOTE: Under some circumstances, **caps** and **shoe booties** may be used. These should be used only once and then discarded.

4. **Hands**—must be washed with antiseptic soap or detergent and water on entering and on leaving the room, and as otherwise indicated during patient care.

5. **Gloves**—must be worn routinely by all personnel who have direct contact with the patient.

6. **Sphygmomanometer and stethoscope**—should be requisitioned and retained in the isolation room until termination of isolation.

7. **Needles and syringes**—no special precautions.

8. **Dressings and tissues**—no special precautions.

9. **Urine and feces**—no special precautions.

10. **Thermometers**—The thermometer and container with disinfectant (70%-90% ethyl or isopropyl alcohol with 0.2% iodine) should remain in the room, with disinfectant changed every 3 days. Oral thermometers may be kept dry; before and after each use, they should be washed with soap and water and wiped with 70%-90% alcohol.

11. **Linen**—

a. In some hospitals, all linen in direct contact with the patient is sterilized prior to use.

b. All mattresses and pillows should be covered with impervious plastic; this plastic should be cleaned with a germicidal detergent solution immediately prior to occupancy of the room.

12. **Dishes**—regular dishes may be used.

13. **Drinking water**—no special precautions.

14. **Clothing and personal effects**—no special precautions.

15. **Laboratory specimens**—no special precautions.

16. **Books, magazines, money, letters, and toys**—no special precautions.

17. **Patient's chart**—no special precautions.

18. **Visitors**—

a. should be limited unless terminal condition of patient fails to justify such precautions.

b. The nursing service should instruct visitors in the use of gowns, masks, and gloves and inform them of the necessity of isolation.

19. **Transporting patients**—should be curtailed to avoid exposure to any source of infection.

20. **Concurrent cleaning**—Routine daily cleaning procedures as used in other rooms should be used in the isolation room. Only fresh cleaning equipment, such as freshly laundered and thoroughly dried mops and cleaning cloths, should be used in a Protective Isolation room. The cleaning personnel must be alerted to the potential hazards and carefully instructed as to proper precautions and protective clothing to be worn when working in a Protective Isolation room.

21. **Terminal disinfection**—general procedures as listed in Introduction.

22. **Special instruments**—no special precautions.

23. **Special procedures trays**—no special precautions.

—NOTES—

Enteric Precautions

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary for children only.*
2. Gowns—must be worn by all persons having direct contact with patient.
3. Masks—not necessary.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons having direct contact with patient or with articles contaminated with fecal material.
6. Articles—special precautions necessary for articles contaminated with urine and feces. Articles must be disinfected or discarded.

Diseases Requiring Enteric Precautions*

Cholera

Diarrhea, acute illness with suspected infectious etiology

Enterocolitis, staphylococcal

Gastroenteritis caused by

- Enteropathogenic or enterotoxic *Escherichia coli*
- *Salmonella* species
- *Shigella* species
- *Yersinia enterocolitica*

Hepatitis, viral, type A, B, or unspecified

Typhoid fever *(Salmonella typhi)*

*See "Isolation Techniques for Use in Hospitals" for details and recommended duration of isolation.

Enteric Precautions

A. PURPOSE

To prevent diseases that can be transmitted through direct or indirect contact with infected feces and, in some instances, heavily contaminated articles. Transmission of infection depends on ingestion of the pathogen.

B. GENERAL COMMENTS

The hazard of cross-infection with the subsequent production of disease due to enterotoxic *E. coli* strains is poorly understood. Enterotoxin production by *E. coli* does not appear to be restricted to particular serotypes or to be inherently related to invasive properties; thus, there is no necessary relationship between enterotoxic and enteropathogenic strains. Only a few laboratories are at present able to identify enterotoxin-producing strains, and disease produced by these organisms will often be attributed to nonbacterial etiologies. It seems prudent to employ Enteric Precautions for patients with diseases that are recognized as being caused by such strains; further clarification of the epidemiologic features of this disease should provide a more secure basis for determining isolation requirements.

1. Proper handwashing, gown, and glove techniques and excretion precautions are sufficient to control cross-infection in this category of isolation. With constant attention to proper handwashing, gloves could be omitted; however, practical experience suggests the need for the additional barrier of gloves to prevent transmission.

2. The importance of handwashing in preventing transmission of enteric diseases must be stressed, not only for hospital personnel but also for the patient, who should be instructed to wash his hands carefully and especially after defecating.

3. Cases of gastroenteritis (caused by salmonella, shigella, *E. coli,* etc.) in newborn infants are especially serious because of possible spread through the nursery. Patients with clinical gastroenteritis or diarrheal disease of suspected infectious etiology should be isolated promptly from all well infants; bacteriologic confirmation of disease should then be obtained. All well infants should be discharged from the nursery as soon as possible.

4. Prompt isolation of adults with gastroenteritis is particularly important in the intensive care unit and other parts of the hospital where person-to-person spread of disease can easily occur.

5. Women on obstetric services with gastroenteritis have been im-

plicated as sources of both individual cases and outbreaks of neonatal diarrheal disease. Infants born to women with gastroenteritis should be isolated presumptively until known to be noncontagious.

6. Although vaccines against typhoid fever and cholera are available, they are not recommended for hospital personnel or patients; they have only limited effectiveness, and cross-infection with these diseases can be prevented by strict attention to proper handwashing techniques.

7. It is impossible to determine with certainty on clinical grounds alone the cause of acute hepatitis. All patients with a hepatitis-like syndrome should be considered to have type A or type B viral hepatitis until proven otherwise. The major mode of transmission of hepatitis A (formerly "infectious hepatitis") is by the fecal-oral route; transmission usually requires close, direct contact with an infected person. Infection has been acquired by ingestion of contaminated food or water, and on occasion by parenteral inoculation. On the other hand, hepatitis B (formerly "serum hepatitis") is most frequently transmitted by the parenteral route. Transmission has occurred by other routes of spread, including oral ingestion of infective serum.

Hepatitis B surface antigen (HB_sAg) has also been found in feces, urine, semen, and saliva of patients with acute hepatitis B, and although the infectiousness of HB_sAg is not known, epidemiologic studies have suggested that hepatitis B may—rarely—be acquired through close, personal contact in the absence of apparent parenteral inoculation. Thus, because of the several documented and potential modes of spread, patients with hepatitis A or hepatitis B or hepatitis of unspecified type should be placed on both Enteric Precautions and Blood Precautions.

The routine use of immune serum globulin (ISG, gamma globulin) for most hospital contacts of a patient with hepatitis is not advised. It should be considered only for persons with appropriate exposure to hepatitis A. ISG has not provided reliable protection against hepatitis B.

8. All wastebaskets should have disposable impervious plastic linings.

9. Bedclothes and linens should be changed at least daily and immediately if soiled.

C. DISEASES AND DURATION OF PRECAUTIONS

1. **Cholera**— for duration of illness.

2. **Diarrhea,** acute illness with suspected infectious etiology—for duration of illness or until infectious etiology has been excluded.

3. **Enterocolitis, staphylococcal**—until patient has had 1 negative culture of feces obtained after cessation of antimicrobial therapy.

4. **Gastroenteritis**—

   a. **Enteropathogenic *Escherichia coli***—until patient has had at

least 3 negative fluorescent antibody examinations or 3 consecutive negative cultures of feces taken at least 24 hours apart after cessation of antimicrobial therapy.

b. **Enterotoxic *E. coli***—precautions should probably be observed for duration of illness.

c. ***Salmonella* species**—for duration of illness (*see also* No. 6, typhoid fever).

d. ***Shigella* species**—until patient has had at least 3 consecutive negative cultures of feces taken at least 24 hours apart after cessation of antimicrobial therapy.

e. ***Yersinia enterocolitica***—for duration of illness.

5. **Hepatitis A, B, or unspecified**—for duration of hospitalization. Several studies have failed to show that feces from patients with hepatitis A were infective when tested 2-3 weeks after the onset of jaundice, and isolation precautions for such patients should be re-evaluated if hospitalization lasts longer than 2 weeks. Isolation precautions for patients with hepatitis B may also be re-evaluated when serologic tests for HB_sAg become consistently negative.

6. **Typhoid fever**—until patient has had at least 3 consecutive negative cultures of feces taken at least 24 hours apart after cessation of antimicrobial therapy.

D. SPECIFICATIONS

1. **Private room**—necessary for pediatric patients, among whom fecal-oral cross-infection is difficult to prevent. Children infected with the same organism may be admitted to the same room. Unless they have fecal incontinence or behavioral problems, adults can be adequately isolated in a multiple-patient room or in a ward if attention is given to all specified details. Isolettes for nursery patients are not sufficient for isolation; a separate room is necessary.

2. **Gowns**—must be worn by all persons having contact with the patient or his excretions. Individual gown technique should be used.

3. **Masks**—not necessary.

4. **Hands**—must be washed with antiseptic soap or detergent and water on entering and on leaving the room, and as otherwise indicated during patient care.

5. **Gloves**—must be worn by all persons having direct contact with the patient or with potentially contaminated objects, such as urinals, bedpans, and commodes.

6. **Sphygmomanometer and stethoscope**—no special precautions unless contaminated by excreta. If contamination occurs, articles should be wiped clean with a germicidal solution.

7. **Needles and syringes**—Special precautions must be taken for viral hepatitis (*see also* Blood Precautions, p. 79):

Disposable needles and syringes are available and should be used for patients in isolation. They must not be reused. Used needles need not be recapped; they should be placed in a prominently labeled, impervious, puncture-resistant container designated specially for this purpose. Needles should not be purposely bent, because accidental needle puncture may occur. Used syringes should be placed in an impervious bag. Both of these containers should be incinerated, or autoclaved before discarding. Reusable needles and syringes should be rinsed thoroughly in cold water after use; the needle should be placed in a puncture-resistant rigid container; syringes and needles should be wrapped using double-bag technique and returned for decontamination and sterilization. Bags should be labeled "HEPATITIS."

8. **Dressings and tissues**—

a. should be placed in an impervious plastic or paper bag and closed securely.

b. This bag should be discarded in the room in a wastebasket lined with an impervious plastic bag. On removal, the wastebasket liner should be sealed and then incinerated without being opened.

c. Impervious bags should be readily available for disposal of tissues at the patient's bedside.

9. **Urine and feces**—

a. should be flushed directly down the toilet. Utensils should be cleaned and replaced at the bedside.

b. Unless they have fecal incontinence or behavioral problems, patients placed on Enteric Precautions may share toilet facilities with nonisolated patients. Each patient must wash his hands before and after using toilet facilities.

c. When a patient is discharged, dirty utensils should be wrapped in an impervious bag; the bag should be closed securely, labeled "CONTAMINATED" or "ISOLATION," and sent for decontamination and sterilization.

10. **Thermometers**—The thermometer and container with disinfectant (70%-90% ethyl or isopropyl alcohol with 0.2% iodine) should remain in the room, with disinfectant changed every 3 days. Oral thermometers may be kept dry; before and after each use, they should be washed with soap and water and wiped with 70%-90% alcohol.

11. **Linen**—

a. Used linen should be put in a laundry bag (clearly marked for isolation usage) in the patient's room or adjacent to the patient's bed. A hot-water-soluble bag is preferable.

b. The water-soluble bags containing contaminated linen should be placed, unopened, in hospital washing machines. Bags that are insoluble must be opened and the contents carefully dumped into washing machines without sorting; the bags must also be washed or discarded.

c. Mattresses and pillows should be covered with impervious plastic. This plastic covering should be cleaned with a germicidal detergent solution or removed with the linens and laundered at the time of terminal disinfection.

12. **Dishes**—

a. Leftover food should be wrapped and discarded in a wastebasket.

b. Liquids should be poured down the sink drain or toilet if located within the room or adjoining bathroom.

c. Dishes, utensils, and trays should be placed in a clean impervious plastic bag, which should be labeled "CONTAMINATED" or "ISOLATION" and sent to the kitchen on the regular dietary cart. Disposable dishes and utensils may be particularly useful.

d. Personnel who wash or handle contaminated dishes should wash hands thoroughly after doing so.

13. **Drinking water**—no special precautions.

14. **Clothing and personal effects**—should, if possible, be laundered or sterilized with gaseous ethylene oxide before being sent home. If not possible, clothing should be double-bagged to be sent home for washing. (*See* Appendix III for home-laundering instructions.)

15. **Laboratory specimens**—

a. Specimens (urine, sputum, feces, and blood) should be put in sterile labeled containers with the lid securely closed.

b. Each container should be put in a clear bag labeled "CONTAMINATED" or "ISOLATION" and sent to the laboratory.

c. Blood specimens from patients with viral hepatitis should be handled as described under "Blood Precautions" (*see* p. 79).

16. **Books, magazines, money, letters, and toys**—Infected children should not share toys with noninfected children; otherwise, there are no special precautions unless items are visibly contaminated with fecal excretions. Contaminated articles should be wiped clean with a germicidal detergent solution.

17. **Patient's chart**—no special precautions.

18. **Visitors**—

a. An attempt should be made to limit the number of visitors.

b. A nurse should instruct visitors on the necessity for strict adherence to isolation procedures.

19. **Transporting patients**—no special precautions needed except with incontinent patients. With them, use clean sheets and pajamas.

20. **Concurrent cleaning**—Routine daily cleaning procedures used in the rest of the ward should be used in the isolation room. Cleaning personnel must be alerted to the potential hazards and carefully instructed as to proper precautions to be used when working in an Enteric Precautions area.

21. **Terminal disinfection**—general procedures as listed in the Introduction, plus

a. Urinals and bedpans should be placed in an impervious plastic bag labeled "CONTAMINATED" or "ISOLATION" and sent for decontamination and sterilization.

b. All grossly soiled disposable items should be discarded in a wastebasket lined with an impervious plastic bag. On removal, the wastebasket liner should be closed securely and then incinerated.

22. **Special instruments** (cystoscopes, proctoscopes, nebulizers, IPPB machines, etc.)—Removable and easily handled parts should be placed in an impervious bag and sent to be decontaminated and disinfected or sterilized. Other parts should be wiped with a germicidal solution and sent for further decontamination.

23. **Special procedure trays** (tracheostomy, lumbar puncture, cutdown trays, etc.)—All material on the tray should be separated into a. *disposable,* b. *autoclavable,* c. *linen,* etc., and handled according to instructions under paragraphs 7, 8, 11, and 22, above.

—NOTES—

—NOTES—

Wound & Skin Precautions

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—desirable.
2. Gowns—must be worn by all persons having direct contact with patient.
3. Masks—not necessary except during dressing changes.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons having direct contact with infected area.
6. Articles—special precautions necessary for instruments, dressings, and linen.

NOTE: *See* manual for Special Dressing Techniques to be used when changing dressings.

Diseases Requiring Wound & Skin Precautions*

Burns that are infected, except those infected with *Staphylococcus aureus* or group A streptococcus that are not covered or not adequately contained by dressings (*see* Strict Isolation)

Gas gangrene (due to *Clostridium perfringens*)

Herpes zoster, localized

Melioidosis, extrapulmonary with draining sinuses

Plague, bubonic

Puerperal sepsis—group A streptococcus, vaginal discharge

Wound and skin infections that are not covered by dressings or that have copious purulent drainage that is not contained by dressings, except those infected with *Staphylococcus aureus* or group A streptococcus, which require Strict Isolation

Wound and skin infections that are covered by dressings and the discharge is adequately contained, including those infected with *Staphylococcus aureus* or group A streptococcus. Minor wound infections, such as stitch abscesses, need only Secretion Precautions.

*See "Isolation Techniques for Use in Hospitals" for details and recommended duration of isolation.

Wound & Skin Precautions

A. PURPOSE

To prevent acquisition of infection by personnel and patients from direct contact with wounds and heavily contaminated articles.

B. GENERAL COMMENTS

1. Sufficient precautions to control cross-infection in this category of isolation include proper handwashing before and after patient contact, proper handling of dressings, linen, and contaminated instruments, and proper use of gowns and gloves when stipulated.

2. Wound infections produced by *Staphylococcus aureus,* group A streptococcus, and *Clostridium perfringens* have generally caused more concern than infections caused by other organisms. However, such other microorganisms as *Escherichia coli,* proteus, and pseudomonas can be transmitted by the contact route and can cause wound infections as well as bacteremia and urinary tract and respiratory tract infections. Thus precautions to prevent contact transmission are necessary for all wound and skin infections, whatever the organism. Minor wound infections, such as stitch abscesses, can be handled under Secretion Precautions—Lesions, regardless of the etiologic agent and whether or not they are covered by a dressing. With "major" and "limited" infections, the etiologic agent is the deciding factor (*see* Table 1, p. 7).

3. The Special Dressing Techniques (*see* General Principles—Techniques) are to be used when handling dressings. These consist of handwashing before and after patient contact, use of 2 sets of gloves, changing gloves between removal of the old dressing and application of the new dressing (and handwashing before putting on the second set of gloves), wearing gown and mask, using sterile equipment, double-bagging soiled dressings, and using the "no-touch" dressing technique (not touching the wound or dressings with the hands).

4. All wastebaskets should have disposable impervious plastic linings.

C. DISEASES AND DURATION OF PRECAUTIONS

1. **Burns with copious purulent drainage, except those infected with *Staphylococcus aureus* or group A streptococcus**—for duration of illness. Burns infected with *S. aureus* or group A streptococcus that have copious purulent drainage should be treated under Strict Isolation. Limited burn wounds infected with these organisms that can easily be covered with a dressing can be treated under Wound & Skin Precautions (*see* Table 1, p. 7).

2. **Gas gangrene** (due to *Clostridium perfringens*)—for duration of illness. Because of the resistance of *C. perfringens* spores, equipment used with a patient with gas gangrene must be properly and carefully disinfected.

3. **Herpes zoster, localized**—for duration of illness. Disseminated disease should be treated under Strict Isolation, particularly when immunosuppressed patients are nearby.

4. **Melioidosis, extrapulmonary with draining sinuses**—for duration of illness.

5. **Plague, bubonic**—until patient has had negative cultures of lesions after cessation of antimicrobial therapy. Pneumonic plague should be treated under Strict Isolation.

6. **Puerperal sepsis, group A streptococcus**—precautions required for vaginal discharge until 24 hours after start of effective therapy.

7. **Wound and skin infections, major, that are not covered by dressings or that have copious purulent drainage, except those infected with *Staphylococcus aureus* or group A streptococcus**—for duration of illness. Major infections with *S. aureus* or group A streptococcus should be treated under Strict Isolation (*see* Table 1, p. 7).

8. **Wound and skin infections, limited, that are covered and the discharge is adequately contained by dressings, including those infected with *Staphylococcus aureus* or group A streptococcus**—for duration of illness. Minor wound and skin infections can be treated under Secretion Precautions—Lesions (*see* Table 1, p. 7).

D. SPECIFICATIONS

1. **Private room**—desirable.

2. **Gowns**—must be worn by all persons having direct contact with the patient. Individual gown technique should be used.

3. **Masks**—must be worn by all persons having direct contact with the patient.

4. **Hands**—must be washed with antiseptic soap or detergent and water on entering and on leaving the room or area, and as otherwise indicated during patient care.

5. **Gloves**—must be worn by persons having direct contact with the infected area. Two sets of gloves must be used when dressings are changed: a set to be worn when removing soiled dressing and another set when applying new dressing; hands should be washed between glove changes.

6. **Sphygmomanometer and stethoscope**—no special precautions unless contaminated by drainage from a wound. If contamination occurs, articles should be wiped clean with a germicidal detergent solution.

7. **Needles and syringes**—no special precations.

8. **Dressings and tissues**—Personnel should take the following special precautions:

a. Dressings should be handled with sterile surgical instruments.

b. Used dressings should be placed in an impervious plastic bag, which should be closed securely, double-bagged, and incinerated without being opened.

9. **Urine and feces**—no special precatuions.

10. **Thermometers**—The thermometer and container with disinfectant (70%-90% ethyl or isopropyl alcohol with 0.2% iodine) should remain in the room, with disinfectant changed every 3 days. Oral thermometers may be kept dry; before and after each use, they should be washed with soap and water and wiped with 70%-90% alcohol. Upon termination of isolation, disinfectant should be discarded, and the thermometer and container should be double-bagged and returned for sterilization.

11. **Linen**—

a. Vigorous movements when changing linen should be avoided to prevent aerosols of microorganisms.

b. Double-bag technique should be used in handling linens to be removed from contaminated area.

c. All mattresses and pillows should be covered with an impervious plastic; this plastic should be cleaned with a germicidal detergent solution or removed with the linens and laundered at the time of terminal disinfection.

12. **Dishes**—no special precautions.

13. **Drinking water**—no special precautions.

14. **Clothing and personal effects**—should, if possible, be laundered or sterilized with gaseous ethylene oxide before being sent home. If not possible, clothing should be double-bagged to be sent home for washing. (*See* Appendix III for home-laundering instructions.)

15. **Laboratory specimens**—no special precautions.

16. **Books, money, magazines, letters, and toys**—no special precautions.

17. **Patient's chart**—no special precautions.

18. **Visitors**—should be limited. They should be informed of the purpose of isolation and also the necessity of avoiding contact with the patient's dressings, linens, or infected skin.

19. **Transporting patients**—Before the patient is transported, the infected area should be adequately covered, and when possible, fresh dressings should be applied. A sterile towel over the area may be used for additional protection.

20. **Concurrent cleaning**—Routine daily cleaning procedures used in the rest of the ward should be applied in the isolation room or area. The cleaning personnel must be alerted to the potential hazards and

carefully instructed as to proper precautions to be used when working in a Wound & Skin Precautions area.

21. **Terminal disinfection**—general procedures as listed in the Introduction.

22. **Special instruments**—Instruments that have come in contact with the infected area should be wrapped in an impervious bag, labeled "CONTAMINATED" or "ISOLATION," and sent to be decontaminated and disinfected or sterilized.

23. **Special procedure trays**—no special precautions unless they have come in direct contact with the infected area; they should be wrapped in an impervious bag, labeled "CONTAMINATED" or "ISOLATION," and sent to be decontaminated and disinfected or sterilized.

—NOTES—

—NOTES—

Discharge Precautions

DISCHARGE PRECAUTIONS
Secretion Precautions—Lesions

A. **PURPOSE**

To prevent acquisition of infection by personnel and patients from direct contact with wounds and secretion-contaminated articles. The likelihood of cross-infection with these diseases is very slight.

B. **GENERAL COMMENTS**

1. Basically, a barrier to transmission is interposed by use of the "no-touch" dressing technique (not touching the wound or dressings with the hands) when changing dressings on these lesions and by use of proper handwashing procedures.

2. Patients with diseases in this category need not be in private rooms or be handled differently from patients without infections except that precautions detailed in the Standard Dressing Technique should be taken. These precautions should be maintained as long as the lesion is considered infective, which usually will be as long as there is a discharge from the lesion or until it has been proven by culture to be free of the infectious organism.

3. The Standard Dressing Technique (General Principles—Techniques) consists of handwashing before and after patient contact, use of sterile equipment when changing dressings, double-bagging the soiled dressings and equipment, and using the no-touch technique when handling the dressings.

4. These precautions apply only with lesions from which there is a discharge.

5. It should be noted that there has been 1 report of 6 hospital-acquired cases of respiratory coccidioidomycosis that followed airborne spread from a patient with draining coccidioidomycosis osteomyelitis. However, this was so unusual that coccidioidomycosis lesions warrant only Discharge Precautions.

C. **DISEASES AND DURATION OF PRECAUTIONS**

1. **Actinomycosis, draining lesions**—for duration of drainage.
2. **Anthrax, cutaneous**—until culture-negative.
3. **Brucellosis, draining lesions**—for duration of drainage.
4. **Burn, skin, and wound infections, minor**—for duration of drainage (*see* Table 1, p. 7, and Appendix IV).

5. **Candidiasis, mucocutaneous**—for duration of illness.

6. **Coccidioidomycosis, draining lesion**—for duration of drainage.

7. **Conjunctivitis, acute bacterial (including gonococcal)**—until 24 hours after start of effective therapy.

8. **Conjunctivitis, viral**—for duration of illness.

9. **Gonococcal ophthalmia neonatorum**—until 24 hours after start of effective therapy.

10. **Gonorrhea**—until 24 hours after start of effective therapy.

11. **Granuloma inguinale**—for duration of illness.

12. ***Herpesvirus hominis* (herpes simplex)**, except disseminated neonatal disease—for duration of illness. For disseminated neonatal disease, *see* Strict Isolation; for oral *H. hominis* disease, *see* Secretion Precautions—Oral.

13. **Keratoconjunctivitis, infectious**—for duration of illness.

14. **Listeriosis**—for duration of illness.

15. **Lymphogranuloma venereum**—for duration of illness.

16. **Nocardiosis, draining lesions**—for duration of illness.

17. **Orf**—for duration of illness.

18. **Syphilis, mucocutaneous**—until 24 hours after start of effective therapy.

19. **Trachoma, acute**—for duration of illness.

20. **Tuberculosis, extrapulmonary draining lesion**—for duration of drainage.

21. **Tularemia, draining lesion**—for duration of drainage.

D. SPECIFICATIONS

Patients in this category need not be managed differently from other patients in the hospital except that precautions detailed in the Standard Dressing Technique should be taken; these include handwashing by personnel and patients before and after handling either dressings or discharge from the lesion. In all other respects, these patients should be managed as noninfected patients.

Secretion Precautions — Oral

A. **PURPOSE**

To prevent acquisition of infection by personnel and patients from direct contact with oral secretions. The likelihood of cross-infection with these diseases is slight.

B. **GENERAL COMMENTS**

The diseases listed in this section can be spread to susceptibles by contact with oral secretions, and thus attention should be given to the proper disposal of oral secretions to prevent spread of infection. The patient should be instructed to cough or spit into disposable tissues held close to his mouth and to then discard the tissues in an impervious bag at his bedside. If the patient has nasotracheal suction or a tracheostomy, the suction catheter and gloves should be placed in an impervious bag for disposal. The bag should be sealed before being discarded as trash. These are the only precautions necessary.

C. **DISEASES AND DURATION OF PRECAUTIONS**

1. **Herpangina**—for duration of hospitalization.
2. **Herpes oralis**—for duration of illness.
3. **Infectious mononucleosis**—for duration of illness.
4. **Melioidosis, pulmonary**—for duration of illness.
5. **Mycoplasma pneumonia**—for duration of illness.
6. **Pneumonia, bacterial,** if not covered elsewhere (*see* Appendix II)—for duration of illness.
7. **Psittacosis**—for duration of illness. There have been rare instances of human-to-human transmission; accordingly, it may be desirable to place a patient with acute psittacosis who is coughing and raising sputum in Respiratory Isolation.
8. **Q fever**—for duration of illness.
9. **Respiratory infectious disease, acute** (if not covered elsewhere)—for duration of illness.
10. **Scarlet fever**—until 24 hours after start of effective therapy.
11. **Streptococcal pharyngitis**—until 24 hours after start of effective therapy.

D. **SPECIFICATIONS**

No special precautions other than those mentioned above.

—NOTES—

Excretion Precautions

A. **PURPOSE**

To prevent acquisition of infection by personnel and patients from direct contact with fecal excretions. Diseases in this category are usually less contagious than those listed under Enteric Precautions.

B. **GENERAL COMMENTS**

1. The diseases listed in this section can be spread to susceptibles through the oral route by contact with fecal excretions from a person excreting the organism. Control is dependent on strict attention to careful handwashing following any patient contact and *especially* following contact with his excretions. The patient should also be instructed in the need for careful handwashing, especially after defecating.

2. Attention should be given to proper sanitary disposal of excretions; for this a standard sewerage system is adequate. Separate toilet facilities are not necessary.

3. In some of these diseases, such as enteric infection with poliomyelitis or ECHO viruses, the virus may be isolated from the oral secretions for up to 14 days after the first clinical signs of disease appear. However, that these secretions can be the natural source of infection for susceptibles has not been demonstrated.

4. Only hospital personnel who have been vaccinated with poliomyelitis vaccine should have direct contact with patients with active poliomyelitis.

C. **DISEASES AND DURATION OF PRECAUTIONS**

1. **Amebiasis**—for duration of illness.
2. ***Clostridium perfringens (Cl. welchii)* food poisoning**—for duration of illness.
3. **Enterobiasis**—for duration of illness.
4. **Giardiasis**—for duration of illness.
5. **Hand, foot, and mouth disease**—for duration of hospitalization.
6. **Herpangina**—for duration of hospitalization.
7. **Infectious lymphocytosis**—for duration of hospitalization.
8. **Leptospirosis** (urine only)—for duration of hospitalization.
9. **Meningitis, aseptic**—for duration of hospitalization.
10. **Pleurodynia**—for duration of hospitalization.
11. **Poliomyelitis**—for duration of hospitalization.
12. **Staphylococcal food poisoning**—for duration of symptoms.

13. **Tapeworm disease (only with *Hymenolepis nana* and *Taenia solium* [pork])**—for duration of illness.

14. **Viral diseases, other (ECHO or Coxsackie gastroenteritis, pericarditis, myocarditis, meningitis)**—for duration of hospitalization.

D. **SPECIFICATIONS**

No special precautions other than those mentioned above.

—NOTES—

Blood Precautions

Blood Precautions

A. **PURPOSE**

To prevent acquisition of infection by patients and personnel from contact with blood or items contaminated with blood.

B. **GENERAL COMMENTS**

1. The diseases in this category are associated with circulation of the etiologic agent in blood, and thus there is a need to be aware of this route of transmission.

2. Blood precautions should be taken for the duration of clinical disease or as long as the etiologic agent can be demonstrated in the blood. Blood Precautions should be taken with anyone who is HB_sAg-positive.

3. In tropical areas, patients with malaria should be housed in screened rooms.

4. These simple precautions should be observed for all hospitalized patients, especially those who may be in the septicemic stage of their infectious disease.

C. **DISEASES AND DURATION OF PRECAUTIONS**

1. **Arthropodborne viral fever** (dengue, etc.)—for duration of hospitalization.

2. **Hepatitis, viral, type A, B, or unspecified** (also listed under Enteric Precautions)—for duration of hospitalization.

3. **Malaria**—for duration of hospitalization.

D. **SPECIFICATIONS**

Specifications pertain to **needle and syringe** precautions and to **labeling** of blood specimens. Disposable needles and syringes are available and should be used for patients in isolation. They must not be reused. Used needles need not be recapped; they should be placed in a prominently labeled, impervious, puncture-resistant container designated specifically for this purpose. Needles should not be purposely bent, because accidental needle puncture may occur. Used syringes should be placed in an impervious bag. Both of these containers should be incinerated, or autoclaved before discarding. Reusable needles and syringes should be rinsed thoroughly in cold water after use; the needle should be placed in a puncture-resistant rigid container; syringes and needles should be wrapped using double-bag technique and returned for decontamination and sterilization.

Specimens collected from patients under Blood Precautions should be prominently labeled with the patient's diagnosis so that ward, transport, and laboratory personnel can take necessary precautions while handling and processing the specimens.

—NOTES—

Appendices

APPENDIX I

INFECTIOUS DISEASES GROUPED ACCORDING TO DEGREE OF RECOMMENDED ISOLATION

X — Recommended at all times
(X) — With direct contact
X* — For susceptibles
D — Desirable, but optional

Private Room	Mask	Gown	Gloves	Excreta & excreta-soiled articles	Blood	Secreta & secreta-soiled articles	
				STRICT ISOLATION			
X	X	X	X	X	X	X	Smallpox
X	X	X	X			X	Anthrax, inhalation; Plague, pneumonic; Vaccinia, generalized and progressive, and eczema vaccinatum
X	X	(X)	(X)			X	Burn, skin, or wound infection, major, with *Staphylococcus aureus* or group A streptococcus that is not covered by a dressing or that has copious purulent drainage (*see* Table 1, p. 7)
X	X	(X)	(X)		X	X	Lassa fever, Marburg virus disease
X	X	(X)	(X)			X	Pneumonia—*Staphylococcus aureus,* group A streptococcus
X	X	(X)				X	Diphtheria (pharyngeal or cutaneous)
X	X*	X	X			X	Varicella (chickenpox); Herpes zoster, disseminated
X		(X)		X	X	X	Congenital rubella syndrome; Disseminated neonatal *Herpesvirus hominis* (herpes simplex)
X			(X)			X	Rabies
				RESPIRATORY ISOLATION			
X	X*					X	Tuberculosis, pulmonary (including tuberculosis of the respiratory tract), suspected or sputum-positive (smear)
X	X						Meningococcal meningitis; Meningococcemia
X	X*					X	Measles (rubeola); Mumps; Rubella (German measles); Pertussis (whooping cough)

Private Room	Mask	Gown	Gloves	Excreta & excreta-soiled articles	Blood	Secreta & secreta-soiled articles	X — Recommended at all times (X) — With direct contact X* — For susceptibles D — Desirable, but optional
				ENTERIC PRECAUTIONS			
D		(X)	(X)	X			Cholera; Enterocolitis, staphylococcal; Gastroenteritis—Enteropathogenic or enterotoxic *Escherichia coli, Salmonella* species, *Shigella* species, *Yersinia enterocolitica;* Typhoid fever
D		(X)	(X)	X		X	Diarrhea, acute illness with suspected infectious etiology
D				X	X	X	Hepatitis, viral, types A, B, or unspecified
				WOUND & SKIN PRECAUTIONS			
D			(X)			X	Gas gangrene (due to *Clostridium perfringens*)
D	X*	X	X			X	Herpes zoster, localized
D	(X)	(X)	(X)			X	Burn, skin, or wound infections, limited, including infections with *Staphylococcus aureus* or group A streptococcus, that are covered by and the discharge adequately contained by a dressing; Plague, bubonic
D		X	X			X	Burn, skin, or wound infections, major (EXCEPT *S. aureus* and group A streptococcus, *see* Strict Isolation) that are not covered by a dressing or that have copious purulent drainage; Melioidosis, extrapulmonary with draining sinuses

Private Room	Mask	Gown	Gloves	Excreta & excreta-soiled articles	Blood	Secreta & secreta-soiled articles	

X — Recommended at all times
(X) — With direct contact
X* — For susceptibles
D — Desirable, but optional

DISCHARGE PRECAUTIONS—ORAL AND LESION SECRETIONS

						X	Actinomycosis, draining lesions; Anthrax (cutaneous); Brucellosis, draining lesions; Burn infection, minor (*see* Table 1, p. 7). Candidiasis, mucocutaneous; Coccidioidomycosis, draining lesions; Conjunctivitis, acute bacterial (including gonococcal); Conjunctivitis, viral; Gonococcal ophthalmia neonatorum; Gonorrhea; Granuloma inguinale; Herpangina; Herpes oralis; *Herpesvirus hominis* (herpes simplex), except disseminated neonatal disease; Infectious mononucleosis; Keratoconjunctivitis, infectious; Listeriosis; Lymphogranuloma venereum; Melioidosis, pulmonary; *Mycoplasma pneumoniae* pneumonia; Nocardiasis, draining lesions; Orf; Pneumonia, bacterial, if not covered elsewhere; Psittacosis; Q fever; Respiratory infectious disease, acute (if not covered elsewhere); Scarlet fever; Skin lesion, minor (*see* Table 1, p. 7); Streptococcal pharyngitis; Syphilis, mucocutaneous; Trachoma, acute; Tuberculosis, extrapulmonary, draining lesions; Tularemia, draining lesion; Wound infections, minor (*see* Table 1, p. 7)

DISCHARGE PRECAUTIONS—EXCRETIONS

				X			Amebiasis (amebic dysentery); *Clostridium perfringens* (*C. welchii*) food poisoning; Enterobiasis; Giardiasis; Hand, foot, and mouth disease; Herpangina; Infectious lymphocytosis; Leptospirosis (urine only); Meningitis, aseptic; Pleurodynia; Poliomyelitis; Staphylococcal food poisoning; Tapeworm disease (only with *Hymenolepis nana* and *Taenia solium* [pork]); Viral diseases, other (ECHO or Coxsackie gastroenteritis, pericarditis, myocarditis, meningitis)

BLOOD PRECAUTIONS

					X		Arthropodborne viral fevers (dengue, yellow fever, Colorado tick fever); Hepatitis, viral, type A, B, or unspecified; Malaria

APPENDIX II

DISEASES LISTED ALPHABETICALLY WITH TYPE AND DURATION OF ISOLATION OR PRECAUTION

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Actinomycosis		
Draining lesions	SeP	DI
Other	none	
Amebiasis (amebic dysentery)	ExP	DI
Anthrax		
Cutaneous	SeP	CN
Inhalation	SI	DI
Arthropodborne viral encephalitides (eastern equine and western equine encephalomyelitis, St. Louis and Venezuelan equine encephalitis)	none	
Arthropodborne viral fevers (dengue, yellow fever, Colorado tick fever	BP (1)	DH
Ascariasis	none	
Aspergillosis	none	
Blastomycosis, North American	none	
Brucellosis (undulant fever, Malta fever, Mediterranean fever)		
Draining lesions	SeP	DI
Other	none	
Burn wound	SI, WSP, or SeP (2)	DI

1. Screened room where mosquito vector is prevalent.
2. Depending on the extent of infection (*see* Table 1, p. 7, and appropriate sections in text).

TYPE OF ISOLATION OR PRECAUTIONS

BP — Blood Precautions
EnP — Enteric Precautions
ExP — Excretion Precautions
PI — Protective Isolation
RI — Respiratory Isolation
SeP — Secretion Precautions
SI — Strict Isolation
WSP — Wound & Skin Precautions

DURATION OF ISOLATION OR PRECAUTIONS

CN — until off antibiotics and Culture-Negative
DH — Duration of Hospitalization
DI — Duration of Illness (with wounds or lesions, DI means until they stop draining)
U — Until 24 hours after initiation of effective therapy

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Candidiasis		
Mucocutaneous (moniliasis, thrush)	SeP	DI
Other	none	
Cat-scratch fever (benign inoculation lymphoreticulosis)	none	
Chancroid (ulcus molle, soft chancre)	none	
Chickenpox (varicella)	SI	(3)
Cholera	EnP	DI
Closed cavity infection		
Draining	SeP	DI
Not draining	none	
Clostridium perfringens		
Food poisoning	ExP	DI
Wound infection		
Gas gangrene	WSP	DI
Other	SeP	DI
Coccidioidomycosis (valley fever)		
Pneumonia	none	
Draining lesions	SeP	DI
Congenital rubella syndrome	SI	DH
Conjunctivitis, acute bacterial (sore eye, pink eye)	SeP	U
Conjunctivitis, gonococcal (ophthalmia neonatorum)	SeP	U
Conjunctivitis, viral (neonatal inclusion blennorrhea, paratrachoma, inclusion and swimming pool conjunctivitis)	SeP	DI
Cryptococcosis (torulosis, European blastomycosis)	none	
Cysticercosis	none	
Cytomegalovirus	none	

3. For 7 days after eruption first appears in normal host; in immunosuppressed hosts, DI; in asymptomatic susceptible patient exposed to varicella, for 3 weeks after exposure.

TYPE OF ISOLATION OR PRECAUTIONS

BP — Blood Precautions
EnP — Enteric Precautions
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SeP — Secretion Precautions
SI — Strict Isolation
WSP — Wound & Skin Precautions

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Diarrhea, acute—infective etiology suspected	EnP	DI
Diphtheria (pharyngeal or cutaneous)	SI	(4)
Echinococcosis (hydatidosis)	none	
Eczema vaccinatum	SI	DI
Encephalitis or encephalomyelitis, arthropodborne	none	
Enterobiasis (pinworm disease, oxyuriasis)	ExP	DI
Enterocolitis, staphylococcal	EnP	CN
Erythema infectiosum	none	
Escherichia coli gastroenteritis		
Enteropathogenic	EnP	(5)
Enterotoxic	EnP	DI
Fever of unknown origin	(6)	
Food poisoning		
Botulism	none	
Clostridium perfringens (*C. welchii* food poisoning)	ExP	DI
Salmonellosis (non-typhoidal)	EnP	DI
Staphylococcal food poisoning	ExP	DI
Furunculosis—staphylococcal	WSP	DI
Gas gangrene (due to *Clostridium perfringens*)	WSP	DI
Gastroenteritis		
Enteropathogenic *E. coli*	EnP	(5)
Enterotoxic *E. coli*	EnP	DI

4. Until 2 cultures from both nose and throat and from skin lesions, if present, taken at least 24 hours apart after cessation of antimicrobial therapy are negative for *C. diphtheriae*.
5. Until 3 consecutive cultures or fluorescent antibody tests of feces taken after cessation of antimicrobial therapy are negative for infecting strain.
6. Patients with fever of unknown origin usually need not be isolated; however, if a patient has signs and symptoms compatible with a disease that calls for isolation, it is appropriate to isolate that patient pending confirmation or exclusion of that diagnosis.

DURATION OF ISOLATION OR PRECAUTIONS

CN — until off antibiotics and Culture-Negative
DH — Duration of Hospitalization
DI — Duration of Illness (with wounds or lesions, DI means until they stop draining)
U — Until 24 hours after initiation of effective therapy

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Salmonella species (except *S. typhi*)	EnP	DI
Salmonella typhi	EnP	(7)
Shigella species	EnP	(7)
Yersinia enterocolitica	EnP	DI
German measles (rubella) (*see also* congenital rubella syndrome)	RI	(8)
Giardiasis	ExP	DI
Gonococcal ophthalmia neonatorum (gonorrheal ophthalmia, acute conjunctivitis of the newborn)	SeP	U
Gonorrhea	SeP	U
Granuloma inguinale (donovaniasis, granuloma venereum)	SeP	DI
Hand, foot, and mouth disease	ExP	DH
Hepatitis, viral		
Type A (infectious, epidemic hepatitis)	EnP & BP	DH (9)
Type B (serum, homologous serum hepatitis)	EnP & BP	DH (10)
Unspecified type, consistent with viral etiology	EnP & BP	(11)
Hepatitis B antigen carrier	BP	DH
Herpangina	SeP & ExP	DH
Herpesvirus hominis (herpes simplex)		
Disseminated neonatal (neonatal vesicular disease)	SI	DI
Mucocutaneous	SeP (12)	DI

7. Until 3 consecutive cultures of feces taken after cessation of antimicrobial therapy are negative for infecting strain.
8. For 5 days after onset of rash.
9. Need for isolation may be reconsidered 2 weeks after onset of jaundice.
10. Need for isolation may be reconsidered when blood becomes consistently negative for hepatitis B surface antigen.
11. Until infectious etiology is excluded; otherwise same as required for the responsible agent.
12. Persons with eczema should avoid contact with oral secretions of patients with herpetic lesions.

TYPE OF ISOLATION OR PRECAUTIONS

BP — Blood Precautions
EnP — Enteric Precautions
ExP — Excretion Precautions
PI — Protective Isolation
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SeP — Secretion Precautions
SI — Strict Isolation
WSP — Wound & Skin Precautions

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Herpes zoster		
Disseminated	SI	DI
Localized	WSP	DI
Histoplasmosis	none	
Hookworm disease (ancylostomiasis, uncinariasis)	none	
Infectious lymphocytosis	ExP	DH
Infectious mononucleosis	SeP	DI
Influenza	none (13)	
Keratoconjunctivitis, infectious (epidemic keratoconjunctivitis, infectious punctate keratitis)	SeP	DI
Lassa fever	SI	DI
Leprosy	none	
Leptospirosis (Weil's disease, canicola fever, hemorrhagic jaundice, Fort Bragg fever)	ExP (14)	DH
Listeriosis	SeP	DI
Lymphocytic choriomeningitis	none	
Lymphogranuloma venereum (lymphogranuloma inguinale, climactic bubo)	SeP	DI
Malaria	BP (15)	DH
Marburg virus disease	SI	DI
Measles (rubeola), including encephalitis	RI	(16)

13. There may be instances when Respiratory Isolation of patients with influenza is indicated, especially if the diagnosis can be made on or soon after admission.
14. Urine only.
15. Screened room where mosquito vector is prevalent.
16. For 4 days after onset of rash.

DURATION OF ISOLATION OR PRECAUTIONS

CN — until off antibiotics and Culture-Negative
DH — Duration of Hospitalization
DI — Duration of Illness (with wounds or lesions, DI means until they stop draining)
U — Until 24 hours after initiation of effective therapy

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Melioidosis		
Pulmonary	SeP	DI
Extrapulmonary with draining sinuses	WSP	DI
Extrapulmonary without draining sinuses	none	
Meningitis		
Aseptic (nonbacterial, abacterial viral, or serous meningitis)	ExP	DH
Listeria monocytogenes	SeP	DI
Neisseria meningitidis (meningococcal)	RI	U
Other bacterial	none	
Meningococcemia	RI	U
Mumps (infectious parotitis)	RI	(17)
Mycobacteria, atypical	none	
Mycoplasma pneumonia	SeP	DI
Neonatal vesicular disease (*Herpesvirus hominis*)	SI	DI
Nocardiosis		
Draining lesions	SeP	DI
Other	none	
Orf	SeP	DI
Pediculosis	none	(18)
Pertussis (whooping cough)	RI	(19)
Plague		
Bubonic	WSP	CN
Pneumonic	SI	CN
Pleurodynia (Bornholm disease, epidemic myalgia)	ExP	DH
Pneumonia		
Bacterial—not listed elsewhere	SeP	DI

17. For 9 days after onset of swelling.
18. Close contact with patient or his personal effects could result in transmission; initiation of effective treatment rapidly reduces this hazard.
19. For 7 days after onset of therapy with either erythromycin or ampicillin; if no therapy is given, for 3 weeks after onset of paroxysms.

TYPE OF ISOLATION OR PRECAUTIONS

BP — Blood Precautions
EnP — Enteric Precautions
ExP — Excretion Precautions
PI — Protective Isolation
RI — Respiratory Isolation
SeP — Secretion Precautions
SI — Strict Isolation
WSP — Wound & Skin Precautions

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Mycoplasma (primary atypical pneumonia, Eaton agent pneumonia)	SeP	DI
Pneumocystis carinii	none	
Staphylococcus aureus	SI	DI
Streptococcus, group A	SI	U
Viral	SeP	DI
Poliomyelitis (infantile paralysis)	ExP	DH (20)
Psittacosis (ornithosis)	SeP	DI (21)
Puerperal sepsis	WSP	DI (22)
Q fever	SeP	DI
Rabies (hydrophobia)	SI	DI
Rat-bite fever (*Streptobacillus moniliformis* disease [Haverhill fever], *Spirillum minus* disease [sodoku])	none	
Relapsing fever	none	
Respiratory infectious disease, acute (if not covered elsewhere)	SeP	DI
Common cold	SeP	DI
Rheumatic fever (acute articular rheumatism)	none	
Rickettsial fevers, tickborne (Rocky Mountain spotted fever, tickborne typhus fever)	none	
Rickettsialpox (vesicular rickettsiosis)	none	
Ringworm (dermatophytosis, dermatomycosis, tinea)	none	
Roseola infantum (exanthem subitum)	none	
Rubella (German measles) (*see also* congenital rubella syndrome)	RI	(23)

20. Need for isolation may be reconsidered 6 weeks after onset of disease since carriage of virus has not been documented after that time.
21. *See* also p. 73.
22. For 24 hours after onset of chemotherapy.
23. For 5 days after onset of rash.

DURATION OF ISOLATION OR PRECAUTIONS

CN — until off antibiotics and Culture-Negative
DH — Duration of Hospitalization
DI — Duration of Illness (with wounds or lesions, DI means until they stop draining)
U — Until 24 hours after initiation of effective therapy

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Rubeola (measles) including encephalitis	RI	(24)
Salmonellosis (for *S. typhi, see* typhoid fever)	EnP	DI
Scabies	none (25)	
Schistosomiasis (bilharziasis)	none	
Shigellosis (including bacillary dysentery)	EnP	(26)
Skin infections	SI, WSP, or SeP (27)	DI
Smallpox (variola)	SI	(28)
Sporotrichosis	none	
Staphylococcal disease (*S. aureus*)		
Burns	SI, WSP, or SeP (27)	DI
Enterocolitis	EnP	CN
Gastroenteritis	ExP	DI
Lung abscess, draining	SI	DI
Pneumonia	SI	DI
Skin infection	SI, WSP, or SeP (27)	DI
Wound infection	SI, WSP, or SeP (27)	DI
Streptococcal disease (group A streptococcus)		
Burns	SI, WSP, or SeP (27)	DI
Endometritis (puerperal sepsis)	WSP	U
Pharyngitis	SeP	U
Pneumonia	SI	U
Scarlet fever	SeP	U

24. For 4 days after onset of rash.
25. Close contact with patient or his personal effects could result in transmission; initiation of effective treatment rapidly reduces this hazard.
26. Until 3 consecutive cultures of feces taken 24 hours apart after cessation of antimicrobial therapy are negative for infecting strain.
27. Depending on the extent of infection (*see* Table 1, p. 7, and sections in text).
28. Until all crusts are shed.

TYPE OF ISOLATION OR PRECAUTIONS

BP — Blood Precautions
EnP — Enteric Precautions
ExP — Excretion Precautions
PI — Protective Isolation
RI — Respiratory Isolation
SeP — Secretion Precautions
SI — Strict Isolation
WSP — Wound & Skin Precautions

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
(Group A strep continued)		
Skin infection	SI, WSP, or SeP (27)	DI
Wound infection	SI, WSP, or SeP (27)	DI
Streptococcal disease (not group A) unless covered elsewhere	none	
Syphilis, mucocutaneous	SeP	U
Tapeworm disease		
Hymenolepis nana	ExP	DI
Taenia solium (pork)	ExP	DI
Other	none	
Tetanus	none	
Toxoplasmosis	none	
Trachoma, acute	SeP	DI
Trichinosis (trichinellosis, trichiniasis)	none	
Trichomoniasis	none	
Trichuriasis (trichocephaliasis, whipworm disease)	none	
Tuberculosis		
Pulmonary, suspected or sputum-positive	RI	(29)
Extrapulmonary, draining lesion	SeP	DI
Tularemia		
Pulmonary	none	
Draining lesion	SeP	DI
Typhoid fever (enteric fever, typhus abdominalis)	EnP	(30)
Typhus fever (endemic fleaborne [murine typhus], endemic louseborne [typhus exanthematicus, classical typhus fever])	none	

29. Until effective therapy begins and there is clinical improvement; *see* Respiratory Isolation section in text.
30. Until 3 consecutive cultures of feces taken after cessation of antimicrobials are negative for *S. typhi*.

DURATION OF ISOLATION OR PRECAUTIONS

CN — until off antibiotics and Culture-Negative
DH — Duration of Hospitalization
DI — Duration of Illness (with wounds or lesions, DI means until they stop draining)
U — Until 24 hours after initiation of effective therapy

DISEASE	ISOLATION or PRECAUTIONS Type	Duration
Urinary tract infection (including pyelonephritis)	none (31)	
Vaccinia		
At vaccination site	none (32)	
Generalized and progressive, eczema vaccinatum	SI	DI
Varicella (chickenpox)	SI	(33)
Variola (smallpox)	SI	(34)
Venezuelan equine encephalomyelitis	none	
Vincent's angina	none	
Viral diseases		
ECHO or Coxsackie gastroenteritis, pericarditis, myocarditis, or meningitis	ExP	DH
Respiratory (if not covered elsewhere)	SeP	DI
Whooping cough (pertussis)	RI	(35)
Wound infections	SI, WSP, or SeP (36)	DI
Yersinia enterocolitica gastroenteritis	EnP	DI

31. Bacteriuric catheterized patients may serve as a source of microorganisms transmitted by direct contact to others, especially others with urinary catheters; adequate handwashing must be performed; spatial dispersal of catheterized patients should also be considered.
32. Should be isolated if there are patients on floor with conditions that make them unusually susceptible to vaccinia virus, such as any unvaccinated infant or patients with eczema, burns, or leukemia.
33. For 7 days after onset of eruption in normal host; in immunosuppressed hosts, DI; in asymptomatic susceptible patient exposed to varicella, for 3 weeks after exposure.
34. Until all crusts are shed.
35. For 7 days after onset of therapy with either erythromycin or ampicillin; if no therapy is given, for 3 weeks after onset of paroxysms.
36. Depending on the extent of infection (*see* Table 1, p. 7, and appropriate sections in text).

TYPE OF ISOLATION OR PRECAUTIONS

BP — Blood Precautions
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DURATION OF ISOLATION OR PRECAUTIONS

CN — until off antibiotics and Culture-Negative
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APPENDIX III

INSTRUCTIONS FOR HOME-LAUNDERING THE CLOTHING OF PATIENTS IN STRICT ISOLATION

CLOTHING should be returned home in impervious double bags. It is suggested that the double bags themselves be burned immediately after the clothing has been removed, or the double bags may be bagged in another impervious plastic bag, closed tight, and discarded with other household trash. Hands should be washed thoroughly after handling the soiled clothing in transferring it from the impervious bags to the home washing machine or other container used for terminal disinfection; such handling should be kept to the absolute minimum.

Colorfast cotton, linen, rayon, nylon, Dacron, or Orlon—should be washed in hot water in a home washing machine with 1 cup of household bleach (5.25% sodium hypochlorite) added to the wash water and laundry detergent, *or* they can be washed by hand after soaking at least 10 minutes in hot water to which laundry detergent and 1 ounce (2 tablespoons) of household bleach (5.25% sodium hypochlorite) per gallon of water have been added.

White cotton—should be boiled for 10 minutes in water and then washed by the usual method or by methods outlined in the paragraph above.

Silk, wool (or any other fabric if the methods in the previous 2 paragraphs do not apply), nonfast colors—should be washed in warm water in a home washing machine with Lysol or other phenolic household disinfectant added to the wash water and laundry detergent to make a final concentration of about 400 ppm of phenol. For Lysol or other products with approximately 5% phenols, add 1 cup of product to the washing machine (change quantity in inverse proportion to concentration of phenols if significantly different from 5%). After washing and rinsing, these clothes should be washed without phenols and rinsed a second time to remove all possible toxic residues of phenols. Clothing can also be washed by hand with phenols in warm water; add 1 ounce (2 tablespoons) of approximately 5% phenolic household disinfectant per gallon of warm water together with the laundry detergent, and rinse thoroughly at least 3 times after washing.

APPENDIX IV

BURNS

PATIENTS with burns should be classified as to the extent of the burn infection, that is, whether the infection is major, limited, or minor (*see* Table 1, p. 7). If minor, the only precautions involving isolation techniques will apply when the burn is dressed, at which time Standard Dressing Techniques should be used, which include recognition of the potentially infective nature of the secretions on the soiled dressings.

Many burn wounds that are deep or cover a large area will be infected by the second or third day. If such an infection is considered to be due to *Staphylococcus aureus* or group A streptococcus and (1) dressings are not employed or (2) there is copious purulent drainage not adequately contained by dressings, the patient should be placed in Strict Isolation; all other major-burn-wound patients may be handled under Wound & Skin Precautions.

Patients with infected limited burn wounds, i.e., ones that are covered and the discharge is adequately contained by dressings, should be managed under Wound & Skin Precautions.

All burn wounds should be dressed using Special Dressing Techniques, since the soiled dressings are potentially highly infective.

In some hospitals, a patient who has an extensive burn wound that is not infected at the time of admission is placed in Protective Isolation, and sterile sheets are used for this particular patient. However. as stated above, by the second or third day almost all burn wounds are considered infected.

Some institutions have a burn unit where all burn patients are kept in the same room or ward and where handwashing between individual patient care is emphasized. Others keep patients separated in private isolation rooms. The burn unit has the advantage of having a specially trained, skilled staff and all the necessary equipment. Being in a separate unit may also contribute to the psychological well-being of the patient.

APPENDIX V

SMALLPOX PRECAUTIONS

SPECIAL PRECAUTIONS for smallpox are necessary because of the hazard of the disease in unvaccinated persons and the stability of the virus within the environment—especially in scabs or pustular material.

Any suspected smallpox case **must be reported IMMEDIATELY by telephone** to the local or state public health department and to the Bureau of Smallpox Eradication, CDC, Atlanta, Georgia (404) 633-3311, Monday through Friday, 8:00 AM to 4:30 PM, and (404) 633-2176 after hours and on weekends.

Few hospitals have adequate facilities for isolating a patient with smallpox, but selected hospitals in the United States, in cooperation with CDC, have established appropriate isolation units. If a patient with suspected smallpox has not been admitted to the hospital and unless immediate admission is absolutely essential, the patient should be quarantined at home or at another location where he will have minimal contact with other persons pending confirmation or exclusion of the diagnosis. CDC offers assistance, 24 hours a day, in making the diagnosis. If a diagnosis of smallpox is confirmed, CDC will assist in arranging safe transportation to an appropriate isolation facility.

The specifications for isolation of suspected or confirmed cases are the same as those for Strict Isolation, except for the following modifications:

1. **Private isolation area**—mandatory.

Other patients and personnel on the ward to which the smallpox patient is admitted should be moved to different patient areas either until they can be revaccinated if successfully vaccinated within the past 3 years, or until 8 days have elapsed after a successful vaccination. If 1 or more of the other patients or personnel already exposed to the patient with smallpox cannot be revaccinated (or vaccinated) following exposure because of eczema, leukemia, etc., they should not be returned to the isolation area, and the use of hyperimmune globulin (HIG) or antivaccinia drugs should be considered.

The isolation facility should meet the following criteria:

a. A separate structure with its own air conditioning, heating, and ventilating system.

b. Adequate water, electricity, heating, cooling, and ventilation.

c. An isolation room with a toilet, a bathtub or shower, and a sink for the patient. The room should be operated under measurably negative air pressure, and all exhaust air should pass through a filter with an efficiency of at least 95% based on the DOP (dioctyo-phthalate) test method.

d. An anteroom for all personnel to change into and out of protective clothing on entering and on leaving the isolation room. The anteroom

must have a shower and a sink for use by everyone leaving the isolation room. The anteroom will form an air barrier between the isolation room and the outside; it will be kept at a pressure intermediate between the isolation room and the outside.

e. An office-communication area outside the anteroom with dependable telephone service to the outside.

f. Adequate communication, preferably by "intercom" units, between each of the rooms of the facility.

2. **Caps and booties**—should be worn by all persons entering the room. These articles must be used only once and then discarded in an appropriate receptacle within the room. The receptacle should, at appropriate intervals, be double-bagged and autoclaved.

3. **Linen (including blankets)**—must be double-bagged and either incinerated or autoclaved.

4. **Dishes**—Only disposable dishes and drinking utensils should be used, then double-bagged and incinerated.

5. **Clothing and personal effects**—

a. **Patients' personal clothing and clothes worn during hospitalization**—should be double-bagged and autoclaved (or incinerated).

b. **Letters, legal documents, etc.**—should be sterilized with gaseous ethylene oxide, or each page, both sides, should be ironed.

c. **Leather objects and books**—should be sterilized with gaseous ethylene oxide. The gas will not penetrate closed books, but if these have not been used by the patient, this danger appears to be negligible.

d. **Toys, jewelry, and other non-autoclavable items**—should be sterilized with gaseous ethylene oxide or boiled or washed with a 5% aqueous solution of phenolic germicidal detergent.

e. **Magazines and newspapers**—should be doubled-bagged and incinerated.

6. **Laboratory specimens**—The laboratory should be notified by telephone of any specimens to be sent there, and advice should be requested as to their handling and shipping, so they will have priority in being processed. Specimens must be wrapped in impervious wrappings, packaged to withstand all shocks or pressure changes incident to transport, double-bagged, and labeled "SMALLPOX."

7. **Visitors**—Visitors with successful vaccinations within the previous 3 years must be revaccinated, but they may enter a contaminated ward immediately after revaccination. All others may not enter the area until 8 days after successful vaccination. Persons who have an equivocal reaction must be revaccinated.

8. **Transportation**—Patients should not be transported within the hospital. Any emergency procedures must be done in the isolation room.

9. **Terminal disinfection**—

a. The entire patient room must be decontaminated by vaporiza-

tion of paraformaldehyde, using procedures recommended by the Center for Disease Control.

b. Cleaning personnel should wet down all surfaces of the room with a 5% aqueous solution of a phenolic germicidal detergent, then thoroughly wet-vacuum the room, wipe all other surfaces with clean cloths or disposable wipes, incinerate or autoclave the vacuum bag and its contents and the cloths and wipes, and disinfect the vacuum cleaner with a 5% aqueous solution of a phenolic germicidal detergent.

c. Mattress and cover should be double-bagged and incinerated or autoclaved.

d. Curtains, draperies, other removable fabrics, and other removable items should be double-bagged and autoclaved or incinerated.

e. After this procedure is completed, the office-communication area outside the isolation room and anteroom should be carefully cleaned, by personnel wearing gowns and masks, using the following procedure:

(1) All disposable items should be discarded in impervious plastic bags.

(2) All furniture and all equipment that cannot be discarded should be washed with a 5% aqueous solution of a phenolic germicidal detergent.

(3) All floors should be wet-vacuumed or mopped with a germicidal detergent solution.

(4) Wiping cloths should be discarded in an impervious plastic bag.

(5) Mop heads should be double-bagged and laundered and thoroughly dried.

f. After the facility has been decontaminated, the filters in the exhaust air system should be carefully double-bagged in impervious plastic and autoclaved or incinerated. Maintenance personnel doing this work should wear gowns, gloves, masks, caps, and booties. The protective clothing of the decontamination and cleaning personnel should be double-bagged and autoclaved or incinerated, and these personnel should shower with soap and shampoo immediately after removing their contaminated clothing.

10. **Autopsy**—If an autopsy is to be performed, extreme precautions must be taken to prevent dissemination of the virus. The autopsy personnel should be notified in advance. Only persons with up-to-date immunizations should be allowed at the autopsy.

The body should be double-wrapped in large, impervious plastic bags in the isolation room. Each of the 2 bags should, in turn, be sealed airtight with tape after removal of as much air as possible. The bagged body should then be moved to the anteroom and similarly sealed in a third large, impervious plastic bag for subsequent transfer to the autopsy room.

The autopsy room must be operated under measurably negative air pressure with respect to the adjacent rooms. There must be a shower room connected with the autopsy room. All doors and windows of the autopsy room must be kept closed during the autopsy, and the air exhausted (to make the room pressure negative) must be passed through a filter with an efficiency of at least 95% based on the DOP (dioctyophthalate) test method. **The isolation room may be used for the autopsy if no other patients are isolated there.**

All autopsy personnel should wear gowns, gloves, masks, caps, and booties; no personal clothing should be worn. All articles and equipment from the autopsy room should be sterilized before removal, and the room should be decontaminated after the autopsy by the same technique and with as much care as is given to terminal disinfection of the isolation room. All clothing worn by autopsy personnel should be removed in the autopsy room, double-bagged, and incinerated or autoclaved. Autopsy personnel should shower with soap and shampoo immediately after removing their contaminated clothing.

After the autopsy room has been decontaminated, the filters in the exhaust air system of the room should be carefully double-bagged in impervious plastic and autoclaved or incinerated. Maintenance personnel doing this work should wear gowns, gloves, masks, caps, and booties. The protective clothing of the maintenance personnel should be double-bagged and autoclaved or incinerated. Maintenance personnel should shower with soap and shampoo immediately after removing their contaminated clothing.

After autopsy, the body should be triple-bagged, as before, in another set of large, impervious plastic bags. The preferable procedure for safe disposal of the body is to fill the plastic bags with formalin embalming fluid, promptly place the body in an airtight coffin, seal the coffin, and proceed with burial or cremation. Undertakers and embalmers should have up-to-date immunizations. The body should not be handled further by undertakers or embalmers.

Any specimens removed from the area must be handled carefully so that they do not serve as sources of infection (*see* No. 6 above).

APPENDIX VI

RECOMMENDATIONS FOR DISINFECTION AND STERILIZATION

DEFINITIONS

Disinfection—The reduction of populations of disease-producing microorganisms (but generally not resistant spores) usually by using chemical germicides or boiling water.

Sterilization—The complete destruction or removal of all forms of microbial life. This is usually accomplished by steam under pressure, as in the autoclave.

PROCEDURES

The agents for disinfection and sterilization are listed by types rather than by specific formulations. Of necessity, the information given is brief. More detailed information must be obtained from such documents as descriptive literature and scientific journals (e.g., American Hospital Assn: Infection Control in the Hospital. 3rd ed., Chicago, AHA, 1974).

The actual compound to be used should be selected by the particular hospital and must depend on the hazards of specific types of contamination as well as the hospital's scope of services, physical facilities, and organization. It is important to remember that whatever method is selected, the procedure must be based on thorough knowledge of the agent and procedure to be used.

All objects or surfaces **must be thoroughly cleaned** before specific methods of disinfection or sterilization are used, in order to remove particulate materials that may be poorly penetrated by the agent used. In the case of instruments and of rubber and polyethylene tubing that come into direct contact with patients, the use of liquid products for disinfection or sterilization should be followed by flushing or rinsing with **sterile** distilled water and drying. Adequate airing is necessary after sterilization with ethylene oxide. Whenever there is a choice, sterilization by heat is preferable to sterilization by any other technique. If possible, objects that will come in contact with skin or mucous membranes, including supplies and equipment for respiratory therapy or anesthesia, should be sterilized.

Specific recommendations, grouped by types of objects to be disinfected or sterilized and by contaminating organisms, are presented in the accompanying table. The letters designate the specific procedures that are acceptable in each situation; the key to these numbers follows the table. Exposure times for each situation are included. It should be noted that certain agents tend to cause some materials to corrode or rust: alcohol, formalin, formaldehyde-alcohol, quaternary ammonium, and iodophor solutions should contain 0.2% sodium nitrite to prevent corrosion; the phenolic solutions should contain 0.5% sodium bicarbonate.

OBJECT	DISINFECTION				STERILIZATION	
	WILL NOT come in contact with skin or tissue		WILL come in contact with skin or mucous membrane		WILL ENTER tissue or vascular system	
	proced	min	proced	min	proced	hours
Smooth, hard-surfaced objects	A	⩾10	A	⩾30	C	18
	D	⩾10	C	⩾30	K	mfr rec
	E	⩾10	F	⩾30	L	12
	G	⩾10	H	⩾30	M	10
	I	⩾10	J[a]	⩾30	P	mfr rec
			L	⩾30		
			M	⩾30		
			N	⩾30		
Rubber tubing and catheters			F	⩾30	K	mfr rec
			H	⩾30	P	mfr rec
			M	⩾30		
			N	⩾30		
Polyethylene tubing and catheters[b,c,d]			A	⩾30	C	18
			F	⩾30	K	mfr rec
			H	⩾30	L	12
			M	⩾30	M	10
			N	⩾30	P	mfr rec
Lensed instruments			L	⩾30	K	mfr rec
			M	⩾30	L	12
					M	12
Thermometers (oral & rectal)[e]			B	⩾30	C	18
			M	⩾30	K	mfr rec
					L	12
					M	10
Hinged instruments					K	mfr rec
					L	12
					M	10
					P	mfr rec

Key to Table

A Ethyl or isopropyl alcohol (70%-90%)

B Ethyl alcohol (70%-90%)

C Formaldehyde (8%) - alcohol (70%) solution

D Quaternary ammonium germicidal detergent solution (2% aq. solution of concentrate)

E Iodophor germicidal detergent — 100 ppm available iodine

F Iodophor — 500 ppm available iodine

G Phenolic germicidal detergent solution (1% aq. solution of concentrate)

H Phenolic solutions (3% aq. solution of concentrate)

I Sodium hypochlorite — 100 ppm available chlorine

J Sodium hypochlorite — 1000 ppm available chlorine

K Ethylene oxide gas; for time, see manufacturer's recommendations

L Aqueous formalin (40% formaldehyde)

M Alkalinized glutaraldehyde (2% aq.)

N Wet pasteurization at 75°C after detergent cleaning

P Heat sterilization — see manufacturer's recommendations

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a Not recommended for metal instruments.

b Be certain tubing is completely filled for disinfection.

c Instruments or catheters that enter tissue or the vascular system should be sterilized.

d Investigate thermostability when indicated.

e Thermometers must be thoroughly wiped, preferably with soap and water, before disinfection or sterilization. Alcohol-iodine solutions will remove markings on poor-grade thermometers. Do not mix rectal and oral thermometers at any stage of handling or processing.