EPI Update for Friday, May 29, 2009
Center for Acute Disease Epidemiology (CADE)
Iowa Department of Public Health (IDPH)

Items for this week's EPI Update include:

- **Novel Influenza A(H1N1) Update**
- **Understanding Laboratory Tests**
- **What a Gas!**
- **Ticks Part II: The Correct Way to Remove an Attached Tick**
- **Meeting announcements and training opportunities**

Novel Influenza A(H1N1) Update

As of 10 a.m., May 29, 2009, 91 cases of novel influenza A(H1N1) have been confirmed in Iowa. No hospitalizations or deaths have been reported. IDPH is incorporating novel influenza A(H1N1) surveillance into routine influenza surveillance activities. The Iowa Influenza Surveillance Network (IISN) will function year-round and reports will include data on novel influenza A(H1N1). Reports will be published on Wednesdays; visit www.idph.state.ia.us/adper/iisn.asp.

Currently IDPH and UHL are recommending testing for novel influenza only for patients who are high risk for complications due to influenza infection, are pregnant, or hospitalized with an influenza-associated condition. Testing in special situations will be considered. In addition, outpatient surveillance sites participating in the IISN will be submitting specimens for testing. This targeted testing will provide a information about novel influenza activity in the state but will not capture every case.

Understanding Laboratory Tests:

Note: no lab test performs correctly 100% of the time. Test performance is measured by 3 values: sensitivity, specificity and predictive value.

The sensitivity of a test is the probability that the test result is positive if the patient is truly positive. For example, if a test is 95% sensitive, then of 100 people who should test positive for a disease, 5 people will be false negatives.

The specificity is the probability that a test is negative if the patient is truly negative. If the test is 97% specific, then of the 100 people without the disease who should test negative, 3 people will test positive, that is, 3 false positives.

The predictive value is determined by the sensitivity and the specificity of the test and the prevalence of the disease in the population being tested. A positive predictive value is the probability of the disease in a patient with a positive result. A negative predictive value is the probability of not having disease when the test result is negative.

Thus a test of sensitivity equal to 50% and specificity equal to 50% is the same as a coin toss in determining whether or not a disease may be present. A general rule of thumb is the combined sensitivity and specificity total should be equal to or greater than 170 to prove clinically useful. Example: Compare two products designed to detect *Giardia* antigen in stool; product A has a sensitivity of 97% and specificity of 97.1%, (sum = 194.1), and product B sensitivity of 95.1% and specificity of 88.4% (sum = 183.5). Since there is a low prevalence, less than 0.1%, of *Giardia* in Iowans, the numbers of false positives with Product B will be much higher.

The positive predictive value is the percentage of individuals with a positive test result who truly have the disease. This can be calculated by the sensitivity of test multiplied by the prevalence of the disease divided by the sensitivity of test multiplied by the prevalence of the disease plus the value of 1 minus the specificity. In the case of *Giardia* and Product B, the positive predictive value is only 0.8 % given the testing population prevalence is as low as the general population of 0.1% or less.

How can the predictive value of laboratory tests be improved? By the health care provider appropriately selecting patients on whom the test is performed. If a test is only performed on patients with a high likelihood of having the disease, then the prevalence is increased, increasing the predictive value of the test. In the *Giardia* example, by performing the antigen on stools on patients with diarrhea, flatulence, and foul smelling stool and who have likely been exposed to *Giardia* increases the predictive value of the test since the prevalence of *Giardia* in the population of patients with symptoms could be as high as 10%. In that case, the positive predictive value rises to 45%.

In some cases, it may be useful to use a laboratory test with a high sensitivity while sacrificing some specificity, especially when it is critical to detect the presence of a certain disease. A good example of this is testing blood donors for HIV. False negatives are unacceptable and only a lab test with high sensitivity is acceptable. In general, laboratory tests with both high sensitivity and high specificity are desirable since both false-negatives and false-positives are equally unacceptable under most circumstances.

What a Gas!

Early in April, eight people were seen in a regional healthcare center for headache, nausea and dizziness with concerns that the symptoms were due to exposure to propane. The eight workers were all employed by a construction contractor and arrived at the ER together early in the evening after spending more than eight hours at the worksite.

The health care provider contacted the Iowa Statewide Poison Control Center (ISPCC), and was advised to test for carboxyhemoglobin (COHgb) since carbon

monoxide (CO) exposure was a likely cause of the symptoms. Initial lab tests for COHgb ranged from 7-13%. All eight cases were treated with oxygen and discharged after symptoms resolved.

Subsequent investigation by IDPH's Environmental Health Division found that a propane-powered piece of equipment had been used in a large but enclosed space that had inadequate ventilation. During follow-up with IDPH, the company indicated that they would use this event to review their policies/procedures to include additional variables in their assessment of air quality at work sites and to consider using monitors when using gas-powered equipment indoors.

CO poisoning is a reportable condition in Iowa. Reporting criteria for CO poisoning is currently defined as:

- A blood carbon monoxide level equal to or greater than 10 percent carboxyhemoglobin or its equivalent with a breath analyzer test **or;**
- A clinical diagnosis of carbon monoxide poisoning regardless of any test result.

CO poisoning must be reported to the county health department, by calling the IDPH Disease Reporting Hotline at 800-362-2736, or by contacting the Iowa Statewide Poison Control Center at 800-222-1222. (Poison Control provides 365/24/7 consultation to the public and physicians on CO treatment.) When reporting, please provide as much background information as possible about event(s) that led to the exposure, including the employer name and phone number, and if the exposure is work related. For more information, contact the IDPH Division of Environmental Health at 800-972-2026 or visit . www.idph.state.ia.us/eh/carbon_monoxide.asp

Ticks Part II: The Correct Way to Remove an Attached Tick

Last week's EPI Update discussed measures to reduce exposure to ticks, but in light of the increased tick activity and the questions received by IDPH, we have decided to expand our discussion of ticks into a three part series. This week's article will focus on the correct way to remove ticks.

If you find a tick, remove it promptly. Folk remedies, such as burning the tick with a match or covering it with petroleum jelly or nail polish, are not effective and can be dangerous because they may force the tick to regurgitate its gut contents, increasing the risk of disease transmission. The tick removal method described below is proven to be effective, and is recommended by the Centers for Disease Control and Prevention.

- Carefully grasp the tick by using tweezers to grip the tick by its mouthparts which are close to the skin. Do not squeeze the tick's body.

- Pull steadily directly away from your skin. Because removing the tick is your main goal, do not be overly concerned if its mouthparts break off in the process (as they will be shed naturally).
- Clean the wound and disinfect the site of the bite.

It usually takes at least 36 hours for an attached infected tick to transmit the Lyme disease bacteria. But tell your doctor if you experience any possible signs or symptoms of Lyme disease after a tick bite, such as fever, joint pain, a rash (some people develop a bull's eye rash) or inflammation at the bite site Symptoms typically occur 3 to 30 days after the bite.

If you find a tick in Iowa, and would like to know what type of tick it is, put it in a plastic bag with a blade of grass, and send it to:

Lyme Disease Surveillance Program
Iowa State University
Science II Rm. 436
Ames, IA 50011

Please include your name, address, place where you found the tick (city or county), information about the animal or person bitten, whether or not the tick was attached, the date the tick was found, and any other related information.

Next week's article will focus on diseases that can be transmitted by ticks in Iowa.

Meeting announcements and training opportunities
None

Have a healthy and happy week!
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800-362-2736