

# LEGIONELLOSIS

**Also known as: Legionnaires' disease**

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## **Responsibilities:**

**Hospital:** Report by IDSS, facsimile, mail, or phone, follow-up required

**Lab:** Report by IDSS, facsimile, mail, or phone

**Physician:** Report by facsimile, mail, or phone

**Local Public Health Agency(LPHA): Follow-up required**

**Iowa Department of Public Health**

**Disease Reporting Hotline: (800) 362-2736**

**Secure Fax: (515) 281-5698**

## **1) THE DISEASE AND ITS EPIDEMIOLOGY**

### **A. Agent**

Legionellosis is an infection caused by *Legionella* species, with *Legionella pneumophila* being the most common. Numerous serogroups are commonly recognized, although *Legionella pneumophila* serogroup 1 is most commonly associated with serious illness.

### **B. Clinical Description**

Symptoms: Legionellosis has two distinct forms: Legionnaires' disease, which is the more severe form of the infection, and Pontiac fever, which is milder. The most common initial symptoms for Legionnaires' disease and Pontiac fever are anorexia, myalgia, malaise and headache. This is rapidly followed by fever (up to 102 – 105° F.), chills and a non-productive cough. Other symptoms may include abdominal pain and diarrhea.

Onset: Can be rapid.

Complications: Legionnaires' disease is associated with pneumonia. The case-fatality rate overall is 5% –30%. Pontiac fever is not associated with pneumonia or death and cases usually recover in 2 - 5 days without treatment. Legionnaires' disease usually cannot be distinguished from other forms of pneumonia and requires specific tests to confirm the diagnosis.

### **C. Reservoirs**

Common reservoirs: *Legionella* species are commonly found in the environment. They have been found in many different kinds of water and water systems, such as hot and cold-water taps and showers, creeks, ponds, whirlpool spas, and cooling towers and evaporative condensers of large air-conditioning systems. Outbreaks of legionellosis have been linked to these sources, as well as to decorative fountains, humidifiers, respiratory therapy devices and grocery store vegetable misters. These bacteria are most likely to reproduce in high numbers in warm, stagnant water, and its presence may be correlated with the presence of free-living amoeba.

### **D. Modes of Transmission**

Airborne: Legionellosis is transmitted via the airborne route after inhalation of aerosols from water sources contaminated with the bacteria. There is no evidence to suggest transmission of *Legionella* from auto air-conditioners or household window air-conditioning units that do not use water as their coolant.

Person-to-person: Legionellosis is not transmitted from person-to-person.

### **E. Incubation period**

The incubation period for Legionnaires' disease is from 2 - 10 days, but most often 5 - 6 days.

The incubation for Pontiac fever is from 5 - 72 hours, but most often 24 - 48 hours.

### **F. Period of Communicability or Infectious Period**

Legionellosis is not communicable from person-to-person. Water sources may continue to spread *Legionella* organisms until corrective treatment is completed.

### **G. Epidemiology**

Legionnaires' disease was named after an outbreak that occurred in Philadelphia in 1976, among people attending a convention of the American Legion. Legionellosis has a worldwide distribution with cases reported from North America, Australia, Africa, South America and Europe. An estimated 8,000 to 18,000 people develop Legionnaires' disease in the United States each year. Most of these are single, isolated cases not associated with an outbreak. Outbreaks usually occur in the summer and fall, though cases occur year-round. Serologic surveys have shown a prevalence of antibodies to *Legionella pneumophila* serogroup 1 at a titer of  $\geq 1:128$  in 1-20% of the population, thus many infections go unnoticed. The illness most often affects older people and males, especially those who smoke or have chronic lung disease. Other risk factors include immunosuppressive therapy and immunosuppressive diseases, such as AIDS and diabetes. *Legionella* is estimated to be responsible for between 0.5% - 5% of cases of community-acquired pneumonias.

### **H. Bioterrorism Potential**

None.

## **2) DISEASE REPORTING AND CASE INVESTIGATION**

### **A. Purpose of Surveillance and Reporting**

To identify sources of public health concern (*e.g.*, a contaminated water source) and to stop transmission from such a source.

### **B. Laboratory and Healthcare Provider Reporting Requirements**

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is through the Iowa Disease Surveillance System (IDSS). The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE  
Lucas State Office Building, 5<sup>th</sup> Floor  
321 E. 12<sup>th</sup> St.  
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website:

[healthclearinghouse.drugfreeinfo.org/cart.php?target=category&category\\_id=295](http://healthclearinghouse.drugfreeinfo.org/cart.php?target=category&category_id=295) to request a supply.

### **Laboratory Testing Services Available**

The State Hygienic Lab will be discontinuing the *Legionella* Antibody (Total) serology test effective 1 Feb 2015. There is typically a delay in development of a measurable antibody response that may affect accurate diagnosis for an acute patient. Recommended testing to perform in lieu of serology are a *Legionella* culture (performed at SHL) and/or a *Legionella* urinary antigen test. While definitive diagnosis is made by culture, performing both culture and urinary antigen test are considered the best diagnostic combination.

## C. Local Public Health Agency Follow-up Responsibilities

Case Investigation: A case investigation should be performed for any diagnosed case of Legionellosis in Iowa.

### Case Investigation

- a. It is the local public health agency (LPHA) responsibility, in conjunction with the hospital infection preventionist, to complete an IDSS *Legionellosis* case investigation by interviewing the case and others who may be able to provide information. Much of the information required can be obtained from the case's healthcare provider or the medical record.
- b. Use the following guidelines to assist in completing the IDSS investigation:
  - 1) Record the demographic information and occupation.
  - 2) Complete the "Clinical Info and Diagnosis" section, providing diagnosis, date of symptom onset, whether hospitalized (and associated dates) and outcome of disease. (One use of this section is to distinguish cases of Legionnaires' disease from Pontiac fever, when possible [*e.g.*, x-ray diagnosed pneumonia indicates Legionnaires' disease]). The investigator may need to ask the healthcare provider to submit a copy of the medical record or enlist his/her aid in completing these sections of the case report form.
  - 3) Record the case's exposures during the 2 weeks before illness onset. Ask questions about travel history in order to help identify where the patient became infected.
  - 4) Provide information regarding "Risk Factors" because legionellosis often affects people who have certain conditions or who smoke.
  - 5) If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.*, the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please indicate this in the Notes in IDSS. When using IDSS, select the appropriate reason under the Event tab in the Event Exception field.
- c. If not using IDSS, mail (in an envelope marked "Confidential") to IDPH, Center for Acute Disease Epidemiology (CADE). The mailing address is:

IDPH, CADE  
Lucas State Office Building, 5<sup>th</sup> Floor  
321 E. 12<sup>th</sup> Street  
Des Moines, IA 50319-0075
- d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

## 3) CONTROLLING FURTHER SPREAD

### A. Isolation and Quarantine Requirements

None.

### B. Protection of Contacts of a Case

None.

### C. Managing Special Situations

#### Response to a Single Case of Community-Acquired Legionellosis

One case of legionellosis does not require any further investigation other than completing the IDSS investigation. See Section 2) C, Case Investigation. Some people report that they must have gotten the infection from a particular place such as work or their places of worship or recreation. Since *Legionella* can be found in a wide variety of water sources at low levels, unless several cases occur that implicate a "source", it is difficult to prove a particular source was the cause of illness. It is not recommended that a water source be tested or decontaminated based on one community-acquired case.

## Response to Healthcare Associated Legionellosis

A laboratory-confirmed case of legionellosis occurring in a patient hospitalized continuously for greater than 10 days before the onset of illness is considered a case of healthcare associated legionellosis. When a case of healthcare associated legionellosis occurs in a hospital or long-term care facility, the infection preventionist at the facility should enhance surveillance efforts for additional cases. If more cases are identified, measures should be taken to identify the source and eliminate the contamination. See Section 3) D below. Additionally, refer to the CDC Guidelines for Preventing Healthcare Associated Pneumonia, which are listed in the references section.

## Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in a particular city/town is higher than usual, or if an outbreak is suspected, investigate clustered cases in the area or institution to determine possible sources of infection. A source of infection could be a cooling tower, decorative fountain, whirlpool spa, grocery store mister, etc. If the investigation indicates a common source, testing of water samples should be done and applicable preventive or control measures should be instituted. Testing water sources is a specialized procedure and will require the assistance of environmental professionals. A confirmed source should be cleaned and decontaminated according to established protocols and a schedule of continued testing must be put in place for a period of time determined on a case-by-case basis. Consult with a CADE epidemiologist at (800) 362-2736 for assistance in investigating, testing, and implementing control measures. CADE can also perform surveillance for cases regionally that may be difficult to identify at a local level.

## D. Preventive Measures/Education

To avoid future exposures:

- Cooling towers should be drained when not in use and mechanically cleaned and maintained according to the manufacturer's recommendations.
- Tap water should not be used in respiratory therapy devices.
- Hotels, cruise ships and other owners of whirlpool spas and decorative fountains should maintain them according to the manufacturer's recommendations, have adequate levels of chlorine or other disinfectant at all times, and keep current on protocols for public health safety.
- After outbreaks, vigilant monitoring of proven sources should be maintained.

## 4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Legionellosis can be found at: [www.cdc.gov/osels/ph\\_surveillance/nndss/phs/infdis.htm#top](http://www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top)

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

## References

- American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26<sup>th</sup> Edition*. Illinois, American Academy of Pediatrics, 2003.
- CDC. Guidelines for preventing health-care-associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR* 2004;53(RR03):1-36.
- CDC Website. Legionellosis: Legionnaires' Disease and Pontiac Fever. [www.cdc.gov/legionella/index.html](http://www.cdc.gov/legionella/index.html)
- Heymann, D., ed. *Control of Communicable Diseases Manual, 20<sup>th</sup> Edition*. Washington, DC, American Public Health Association, 2015.
- Fiore, A.E., et al. Epidemic Legionnaires' Disease Two Decades Later: Legionellosis Sources, New Diagnostic Methods. *Clinical Infectious Diseases*. 1998; 26:426-433.