

Legionellosis

Surveillance Protocol

Provider Responsibility

1. Report all cases to your local health department within the timeframe indicated:
Sporadic case of Legionellosis – should be reported within 1 week of diagnosis

Outbreaks of Legionellosis – should be reported immediately (see definition of outbreaks in local health department responsibility section)

Laboratory Responsibility

1. Report all positive Legionella tests to the local health department in the patient's county of residence within 1 week of result. Report the result by electronic messaging when possible, or send or fax a copy of the laboratory result to the local health department in the county of residence of the case patient.

Local Health Department Responsibility

For investigation of sporadic cases:

Initial report must be filed within 1 week of first notification

1. Complete the WVEDSS Legionellosis Disease Reporting Form. Use of the WVEDSS Reporting Form will prompt a complete and appropriate investigation, to include:
 - Identification of specific behaviors or factors associated with *Legionella* infection (i.e., smoking, chronic or underlying medical condition, emphysema or other chronic lung disease, immunocompromised)
 - Identify cases that have travel history in the 2 weeks prior to illness onset
 - Identify possible exposures including: dental work, inpatient or outpatient hospital stay
2. If the case reports travel history in the 2 weeks prior to illness, more detailed information regarding travel history is needed. Collect information on:
 - a. Destination(s) and specific date(s) of travel (including stops along the way)
 - b. Lodging accommodations with room numbers and address
 - c. Method of travel (flying, driving, etc.)
 - d. Any water exposures (i.e. hot tubs, pools, showers)
 - e. Anyone else in the travel party or that they know who got sickNotify DIDE of travel associated cases as soon as possible.
3. Although they are routinely requested, it is **not** necessary or recommended to conduct an environmental investigation, for the source of infection, for a single,

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Legionellosis

Surveillance Protocol

sporadic case. Since *Legionella* can be found in a wide variety of water sources at low levels, it is difficult to prove a particular source was the cause of illness unless another case occurs that also implicates the suspected “source”. Alleged sources should not be tested or decontaminated based on one sporadic case. Environmental investigations and testing should only be undertaken in the context of a Legionellosis outbreak.

4. Because Legionellosis is not transmitted person-to-person, there are no isolation control measures necessary.

For investigation of a suspected outbreak:

Outbreak is defined as greater than expected numbers of cases reported during a certain time frame

Waterborne disease outbreak is defined as two or more persons who experience similar illness after consumption or use of water intended for drinking or recreational use.

1. Typically, potential outbreaks of Legionellosis are recognized by the CDC Legionellosis surveillance team as they review all travel associated sporadic cases looking for commonalities. If a suspected source is identified in the state, the appropriate local health department will be notified to begin an investigation.
2. Prompt interviewing of cases and an environmental assessment of the facility is necessary.
3. For up to date information and resources for investigation of a suspected Legionellosis outbreak, see <http://www.cdc.gov/legionella/health-depts/inv-tools.html>. This site contains questionnaires to be used during interviews with cases, tools for the environmental assessment of an implicated facility, and guidelines for remediation of water sources.
4. If multiple cases of Legionellosis are identified in your local health jurisdiction, contact DIDE and notify of suspected outbreak so that CDC can be notified and appropriate resources can be utilized.

State Health Department Responsibility

1. Prompt and complete reporting of Legionellosis cases to the Centers for Disease Control (CDC) through WVEDSS

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Legionellosis

Surveillance Protocol

2. Report travel associated cases of Legionellosis to the CDC within 7 days of notification
3. Provide technical expertise and consultation regarding surveillance, investigation, control measures and prevention of Legionellosis
4. Notify CDC of suspected outbreaks identified in West Virginia and assist local health jurisdictions in obtaining the knowledge and resources necessary for investigation of a Legionellosis outbreak.
5. Summarize surveillance data for cases of Legionellosis on an annual basis

Disease Control Objectives

Prevent additional cases of legionellosis by early recognition and investigation of outbreaks of legionellosis so that control measures can be applied in a timely fashion.

Disease Prevention Objectives

There is very little that can be done to prevent sporadic cases of legionellosis at the community level. Early identification of outbreaks can prevent occurrence of additional cases if a thorough investigation is performed and a common source is identified.

Disease Surveillance Objectives

1. To determine the incidence of legionellosis in West Virginia.
2. To identify demographic characteristics of persons with legionellosis.
3. To detect any increase in the number of cases of legionellosis or any unusual clustering of cases.

Public Health Significance

Legionnaires' disease accounts for two to 15% of cases of community acquired pneumonia. Due to difficulty with diagnosis and ready availability of broad spectrum antibiotics effective against *Legionella*, the disease is often under-diagnosed and under-reported.

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Since the dramatic outbreak at the American Legion Convention in Philadelphia in 1976, large community based outbreaks and nosocomial outbreaks of legionellosis have been documented. Mortality ranges from five to 15%; higher mortality rates have occurred in nosocomial outbreaks. Outbreaks have been recognized in association with cooling towers, potable water, whirlpools, humidifiers, fountains, grocery store misters, and other sources of water aerosol.

Clinical Description

Legionellosis is a bacterial disease that is more common in adults over the age of 50 and is extremely rare in those under age 20. Most cases occur in males, with an estimated male:female ratio of 2.5:1. *Legionella* can cause two clinically distinct syndromes: Legionnaires' disease and Pontiac fever.

Legionnaires' disease is a type of pneumonia which may be accompanied by fever, cough, and chest pain. Classified among the atypical pneumonias, early symptoms may include low grade fever, malaise, anorexia, headaches, and myalgias. Gastrointestinal symptoms are sometimes prominent in the early phase of illness and may lead to delayed recognition. Patients with severe disease may progress to stupor, respiratory failure, and multi-organ failure. The case-fatality rate may be as high as 39% in some hospitalized patients.

By contrast, Pontiac fever results in flu-like symptoms that spontaneously resolve without treatment in two to five days. This syndrome is usually recognized only in association with outbreaks.

The table below provides a quick comparison of the two syndromes:

Legionnaire's Disease	Pontiac Fever
<ul style="list-style-type: none">• Incubation period of 2-10 days• Atypical pneumonia• Older individuals with chronic underlying conditions• Mortality 5-39%• Low attack rate (5%)	<ul style="list-style-type: none">• Mean incubation period of 36 hours• Influenza-like illness• Healthy young adults• Self-limited illness• High attack rate (95%)

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Etiologic Agent

Legionellae bacteria are associated with Legionnaires' disease and Pontiac fever. Forty-three species of *Legionella* with at least 65 serogroups have been identified. *Legionella pneumophila* serogroup 1 is most commonly associated with disease.

Reservoir

The bacteria has been isolated in water from hot water systems, air conditioning cooling towers, evaporative condensers, humidifiers, whirlpool spas, respiratory therapy devices, decorative fountains, hot and cold water taps and showers, and hot tubs. *Legionella* has also been isolated in creeks, ponds, and soil from their banks. Testing of environmental sources is expensive and should not be undertaken unless the source is implicated through an epidemiological investigation.

Mode of Transmission

Legionella transmission is airborne through contaminated aerosols and possibly through aspiration of contaminated water. There is no person-to-person transmission.

Incubation Period

The incubation period for Legionnaires' disease is two to 10 days, usually five to six days. The incubation period for Pontiac fever is five to 66 hours, usually 24 to 48 hours.

Period of Communicability

Legionella is not transmitted person-to-person.

Outbreak Recognition

Outbreaks of *Legionella* pneumonia have been associated with contaminated cooling towers and evaporative condensers, showers, decorative fountains, humidifiers, respiratory therapy equipment, and whirlpool spas. Outbreaks may present to public health as reports of increased numbers of cases of pneumonia, sometimes without a specific diagnosis. Prompt investigation must include case-finding, case confirmation and a detailed review of all the patient's activities during the 2 to 10 days prior to onset of symptoms. These investigations are difficult and time consuming; however, community based outbreaks of legionellosis are associated with substantial mortality, so the quality and timeliness of the investigation is important.

By contrast, outbreaks of Pontiac fever present as an outbreak of influenza-like illness (usually in healthy adults) shortly after a common exposure.

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Sporadic cases and outbreaks of *Legionella* are seen more often during the summer and fall, but it is possible for cases of *Legionella* to occur anytime during the year. Multiple outbreaks have been noted among hospitalized patients.

Case Definition

Clinical Description

Legionellosis is associated with two clinically and epidemiologically distinct illnesses: Legionnaires' disease, which is characterized by fever, myalgia, cough, and clinical or radiographic pneumonia; and Pontiac fever, a milder illness without pneumonia.

Laboratory Criteria for Diagnosis

Suspected:

- By seroconversion: fourfold or greater rise in antibody titer to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6).
- By seroconversion: fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigen and validated reagents.
- By the detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, Immunohistochemistry (IHC), or other similar method, using validated reagents.
- By detection of *Legionella* species by a validated nucleic acid assay.

Confirmed:

- By culture: isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid.
- By detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents.
- By seroconversion: fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents.

Case Classification

Suspected: A clinically compatible case that meets at least one of the presumptive (suspected) laboratory criteria.

- Travel-associated: a case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness.

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Confirmed: A clinically compatible case that meets at least one of the confirmatory laboratory criteria.

- Travel-associated: a case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness.

Preventive Interventions

The key to preventing legionellosis is maintenance of the water systems in which *Legionella* grow, including drinking water systems, hot tubs, decorative fountains, and cooling towers. Guidelines for appropriate water temperatures and chemical treatment of water for legionellosis prevention can be found in [ASHRAE Guideline 12-2000](#).

There are no vaccines that can prevent legionellosis. Persons at increased risk of infection may choose to avoid high-risk exposures, such as being in or near a hot tub.

Treatment

Pontiac fever is self-limited and does not require antibiotic treatment. The recommended treatment for Legionnaire's Disease is intravenous azithromycin, erythromycin, or a respiratory fluoroquinolone such as levofloxacin. Once condition of the patient is improving, oral therapy can be substituted. Duration of therapy is 5 to 10 days for azithromycin and 14 to 21` days for other drugs. Longer courses of therapy are recommended for patients who are immunocompromised or who have severe disease.

Surveillance Indicators

- Proportion of investigations with complete clinical and demographic information.
- Proportion of cases with complete two to 10 day history of high-risk activities and travel.

References

1. Pickering LK, ed. Red Book: 2012 Report of the Committee on Infectious Diseases. 29th ed. American Academy of Pediatrics; 2012: 461-462.
2. Heymann DL, ed. Control of Communicable Diseases Manual. 19th ed. American Public Health Association; 2008: 337-340..

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