

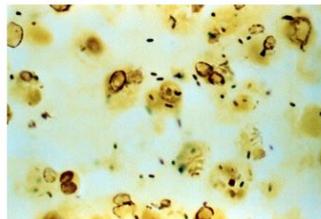
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Legionnaires' Disease

Legionellosis is a bacterial respiratory infection which can result in severe pneumonia and death. Most cases occur singly but legionellosis outbreaks can occur in hotels, communities, healthcare facilities, and other settings.



Legionella in lung tissue
Centers for Disease Control and Prevention

Updates to Legionellosis Guidelines in 2020

The [case definition for legionellosis](#) was approved by the Council of State and Territorial Epidemiologists (CSTE) in June 2019. This update, effective for cases with onsets in 2020, includes the following changes.

- Extrapulmonary legionellosis was added as a clinically distinct syndrome: clinical evidence of disease at a site other than lungs and diagnostic testing that indicates evidence of *Legionella* at that site.
- PCR positive, clinically compatible cases meet the confirmed case classification (previously suspect)
- The exposure period for Legionnaires' disease was changed to the 14 days before onset (previously 10 days before onset)
- The definitions for healthcare-associated legionellosis have changed:
 - Presumptive healthcare-associated Legionnaires' disease: A case with ≥ 10 days of continuous stay at a healthcare facility during the 14 days before onset of symptoms.
 - Possible healthcare-associated Legionnaires' disease: A case that spent a portion of the 14 days before date of symptom onset in one or more a healthcare facilities, but does not meet the presumptive criteria.



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The addition of a probable case classification for Legionnaires' disease and Pontiac fever: A clinically compatible case with an epidemiologic link to a setting with a confirmed source of *Legionella* (e.g., positive environmental sample associated with a cruise ship, hotel or motel, cooling tower, etc.) or an epidemiologic link to a setting with a suspected source of *Legionella* associated with at least one confirmed case during the 14 days (Legionnaires' disease) or three days (Pontiac fever) before onset of symptoms.

Washington State Public Health Laboratories (PHL) recently became certified as an Environmental *Legionella* Isolation Techniques Evaluation (ELITE) laboratory; when approved by the local health jurisdiction and the Department of Health (DOH) Office of Communicable Disease Epidemiology, environmental samples can now be sent to PHL for testing (see Resources). In general, PHL will test environmental samples only as part of outbreak investigations. In addition, PHL can perform diagnostic PCR and culture from respiratory specimens.

In order to help long term care facilities establish and maintain water management programs to aid in *Legionella* prevention, DOH has made a series of [instructional videos](#).

Legionellosis



Legionnaires' disease symptoms are similar to other types of pneumonia and often look the same on a chest x-ray.
Centers for Disease Control and Prevention

Legionellosis was first recognized in 1976 when an outbreak affected more than 200 people and caused more than 30 deaths, mainly among attendees of a Legionnaires' convention being held at a Philadelphia hotel.

Numerous *Legionella* species and serogroups cause disease but most recognized infections are due to *L. pneumophila* serogroup 1. The extent to which this is due to testing bias is unclear since only *L. pneumophila* serogroup 1 is identified via commonly used urine antigen tests; other species and serogroups must be identified through PCR or culture, tests which are less commonly ordered.

Legionellosis involves three clinically distinct syndromes: Pontiac fever, a self-limited illness without pneumonia; Legionnaires' disease, a potentially fatal pneumonia; and Extrapulmonary legionellosis, an infection at a site outside the lungs (e.g., heart valve, wound, joint infection, or graft infection.)

Health conditions that increase the risk of pneumonia include: age fifty years or older, chronic kidney or liver failure, diabetes, systemic malignancy, chronic lung disease (like COPD or emphysema), current or former smoker, immune system disorders, or immunosuppressive treatment,

Exposure is through inhalation of aerosolized water contaminated with *Legionella* bacteria. Although the bacteria occur commonly in both natural and artificial freshwater environments, there are rarely sufficient *Legionella* to cause an infection. Factors that allow the bacteria to amplify to higher concentrations include higher water temperatures (77-108° F), stagnation,

sediments, biofilms, and the presence of amoebae. Centers for Disease Control and Prevention (CDC) estimate that in Legionnaires' disease outbreaks less than five percent of exposed persons develop infections but over 90 percent of exposed persons develop illness in Pontiac fever outbreaks.

Epidemiologic risk factors for exposure to *Legionella* include recent travel with an overnight stay, exposure to whirlpool spas, or maintenance of domestic plumbing. Nationally, legionellosis outbreaks have been associated with potable water systems, whirlpool spas, and cooling towers. Such sources promote both amplification and aerosolization of contaminated water. Hotels, hospitals, long-term care facilities, and cruise ships have been sites of outbreaks. Recently, legionellosis has been in the news due to an increased emphasis on primary prevention via water management planning and the concomitant release of numerous CDC materials on this topic, and because of multiple outbreaks nationwide.

A local health jurisdiction receiving a legionellosis case notification performs a detailed patient interview, with the information collated at the state and federal levels, and commonalities in exposures investigated as indicated. The [DOH legionellosis guideline](#) has more information about case investigations. During recent years in Washington, 50 to 70 legionellosis cases have been reported annually, with about ten percent of cases being fatal.

Increased awareness and testing may result in more cases being diagnosed. Clinical suspicion and proper diagnostic testing for legionellosis are necessary to identify and treat patients appropriately.

For suspected cases, clinicians should collect *both* urine and respiratory specimen (for urine antigen test and for culture, respectively.) Urine antigen tests are rapid but can identify only *Legionella pneumophila* serogroup 1 infections. While PCR positive tests are now considered confirmatory, cultures of respiratory specimens are necessary to allow comparison between patient and environmental isolates during case and cluster investigations, so reflect cultures should be done for any positive respiratory result. [Information for clinicians about legionellosis](#) is available from CDC.

CDC recommend that many facilities have water management programs for primary prevention of Legionnaires' disease and other waterborne illnesses. In June 2017, the Centers for Medicare and Medicaid Services stated that [healthcare facilities should develop and implement water management programs to reduce the risk for *Legionella* and other pathogens](#)

Problem:

Legionnaires' disease can occur in your health care facility

Health care facilities may put people at risk for LD when they do not have an effective water management program. These limit germ growth by:

- Keeping hot water temperatures high enough.
- Making sure disinfectant amounts are right.
- Keeping water flowing (preventing stagnation).
- Operating and maintaining equipment to prevent slime (biofilm), organic debris, and corrosion.
- Monitoring factors external to buildings, such as construction, water main breaks, and changes in municipal water quality.

Contaminated water droplets can be spread by:

- Showerheads and sink faucets.
- Hydrotherapy equipment, such as jetted therapy baths.
- Medical equipment, such as respiratory machines, bronchoscopes, and heater-cooler units.
- Ice machines.
- Cooling towers (parts of large air-conditioning systems).
- Decorative fountains and water features.

Health care facility leaders and providers should be aware that some people are at increased risk for LD:

- Adults 50 years or older.
- Current or former smokers.
- People with a weakened immune system or chronic disease.

16 of 21 jurisdictions reported definite cases of health care-associated LD in 2015

Preventing the first case
A *Legionella* water management program routinely consists of:

1. Establishing a water management program team.
2. Describing the building water systems using words and diagrams.
3. Identifying areas where *Legionella* could grow and spread.
4. Deciding where control measures should be applied and how to monitor them.
5. Establishing ways to intervene when control limits are not met.
6. Making sure the program is running as designed and is effective.
7. Documenting and communicating all the activities.

www.cdc.gov/legionella/WMPtoolkit

SOURCE: ACHWA 100 LegiWellness Risk Management for Building Water System, June 26, 2015.

*Always had no cases to report.

SOURCE: Supplemental Legionnaires' Disease Surveillance System (SDSS), CDC, 2015.

Centers for Disease Control and Prevention: [Vitalsigns](#)

[in their water systems](#). DOH has made a [series of instructional videos to help long term care facilities](#) establish and maintain a water management plan to aid in *Legionella* prevention.

In a cluster or healthcare investigation, several sections within DOH, including Office of Communicable Disease Epidemiology, Division of Environmental Public Health, and Division of Health Services Quality Assurance, support the local health jurisdiction to investigate and respond. In the context of a cluster or healthcare-associated investigation, environmental and clinical specimens can be sent by the Washington State Public Health Laboratories to CDC for genetic fingerprinting. This ability to match patient and environmental isolates underscores the importance of obtaining respiratory specimen for cultures and not just urine (for urine antigen testing) for patients with suspected legionellosis.

Legionellosis is nationally notifiable. In Washington, healthcare providers, healthcare facilities, and laboratories must report patients with legionellosis within 24 hours of diagnosis to the local health jurisdiction where the patient resides. In addition, laboratories must submit clinical *Legionella* isolates to PHL within two business days. By rapidly identifying a cluster of cases, public health agencies can recognize, investigate and stop outbreaks of legionellosis.

Resources

CDC clinician resources: <http://www.cdc.gov/legionella/clinicians.html>

CDC water management information: <https://www.cdc.gov/legionella/maintenance/wmp-toolkit.html>

DOH surveillance and investigation guideline:
<http://www.doh.wa.gov/Portals/1/Documents/5100/420-058-Guideline-Legionellosis.pdf>

CSTE position statement detailing changes in 2020:
https://cdn.ymaws.com/www.cste.org/resource/resmgr/2019ps/final/19-ID-04_Legionellosis_final.pdf

ELITE lab capacity: <https://wwwn.cdc.gov/Elite/Public/EliteHome.aspx>

ELITE Lab Capacity for *Legionella* Testing at the WA State PHL:
<https://www.doh.wa.gov/Portals/1/Documents/Pubs/420-272-LegionellaEliteLab.pdf>

DOH Microbiology testing information:
<https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/PublicHealthLaboratories/MicrobiologyLabTestMenu/u16574q/4C6567>

DOH Legionella Prevention for Long-Term Care Facilities (with instructional videos):
<https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/HealthcareProfessionsandFacilities/HealthcareAssociatedInfections/InfectionControlAssessmentandResponse/LegionellaPrevention>