

Frequently Asked Questions Legionellosis and Water Management Programs for Long-Term Care Facilities

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What is Legionellosis?

Legionellosis (LEE-juh-nuh-low-sis) is caused by the bacteria *Legionella* and can cause two distinct syndromes: Legionnaires' disease (LD) and Pontiac fever. Persons with LD typically present with severe pneumonia. It usually requires hospitalization and can be fatal in approximately 10% of cases. Symptom onset most commonly occurs in the 14 days after exposure.¹

A milder infection caused by the same type of *Legionella* bacteria is called Pontiac Fever.¹ The symptoms of Pontiac Fever usually last for 2 to 5 days and may also include fever, headaches, and muscle aches; however, there is no pneumonia. Symptoms go away on their own without treatment and without causing further problems.

How common is Legionellosis?

Legionella bacteria are important causes of community-acquired and nosocomial pneumonia especially in the elderly and immunosuppressed.¹ Legionnaires' disease makes up roughly 1-10% of community-acquired pneumonia cases and reports have risen in the U.S. since its identification in 1976. However, studies have shown that the numbers are likely underestimates of the true prevalence of LD because it is underdiagnosed. In 2018 there were 54 reported cases of Legionellosis in Washington. The Washington State Department of Health publishes annual infection numbers and rates in the [Communicable Disease Annual Report](#).

Can persons with Legionellosis spread it to others?

Legionella is transmitted via inhalation of aerosolized water containing the bacteria. Less commonly, *Legionella* can be transmitted via aspiration of drinking water. *Legionella* is not usually spread from person-to-person. There has only been one case in which person-to-person transmission has been documented.² Outbreaks have implicated contaminated plumbing systems including hot water tanks and shower heads and faucets, as well as mist from cooling towers, whirlpool spas, respiratory therapy equipment, and decorative fountains including water walls.³ The bacteria multiply in warm water and are often associated with biofilms. Biofilms form in plumbing when microorganisms attach to surfaces and become enclosed in a matrix of polysaccharides. Sloughing of biofilms due to jarring of plumbing (such as may occur in construction) or changes in water chemistry (such as changes in chlorination procedures or water source) can cause *Legionella* bacteria, if present in the biofilm, to be released into the plumbing system. Maintaining building water systems is key to preventing LD. In healthcare settings, Water Management Programs (WMP) identify hazardous conditions and include steps to minimize the growth and spread of *Legionella* in building water systems.⁴

Do I need a Water Management Program (WMP) for my long-term care facility?

Yes, in 2017 the Centers for Medicare and Medicaid Services (CMS) instituted [requirements](#) that long-term care (LTC) facilities “develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of legionella and other opportunistic pathogens in water.”⁵ Water Management Programs (WMP) are the industry standard for reducing the risk of Legionellosis in healthcare. To meet the 2017 CMS mandate, Medicare-certified LTC must develop and WMP. Having a WMP is now an industry standard for large buildings in the United States.

According to the Centers for Disease Control and Prevention (CDC), 4 out of 5 (80%) of healthcare associated *Legionella* outbreaks in the US could have been prevented with an effective water management plan.

What are risk factors for Legionnaire’s disease?

Risk factors⁶ for developing Legionnaires’ disease include:

- Persons ≥50 years of age
- Smoking (current or historical)
- Chronic lung disease (e.g., emphysema or chronic obstructive pulmonary disease)
- Immune system disorders due to disease or medication (e.g., cancer, corticosteroid use)
- Systemic malignancy
- Underlying illness such as diabetes, renal failure, or hepatic failure

When should I test a patient for Legionnaire's disease?

The Centers for Disease Control and Prevention (CDC) recommend testing patients for LD when one or more of the following occur:

- Patient has failed outpatient antibiotic treatment for community-acquired pneumonia
- Patient with severe pneumonia (i.e., requires intensive care)
- Immunocompromised patients with pneumonia
- Patients with a travel history (patients who have traveled away from their home within 10 days before the onset of illness)
- All patients with pneumonia in the setting of an outbreak of LD
- Patients at risk for LD with healthcare-associated pneumonia (i.e., pneumonia with onset \geq 48 hours after admission)

Testing patients for LD is especially important if any of the following⁶ are identified in your LTC facility:

- Other patients have been diagnosed with healthcare-associated LD in the past 12 months
- Positive environmental tests for *Legionella* in the past 2 months
- Current changes in water quality that may lead to *Legionella* growth (such as low chlorine levels)

What type of specimens are needed to test a patient for Legionnaire's disease?

If you suspect that a patient has LD, collect both a respiratory (for *Legionella* culture) and a urine specimen (for urinary antigen test). A urinary antigen test only identifies *Legionella pneumophila* serogroup 1. While most disease is caused by *Legionella pneumophila* serogroup 1, there are at least 60 other species that are pathogenic. Since other species and serogroups cause illness, it's important to collect a respiratory specimen so that culture testing can be performed to determine if the patient is infected with another species of *Legionella* (e.g., *L. micdadei*, *L. longbeachae*, *L. bozeman*) types. Examples of respiratory specimens include sputum and bronchoalveolar lavage. Specimens should be collected before antibiotic administration to ensure accurate results, however do not delay giving antibiotics while waiting to collect a specimen or results.

If you suspect that a patient has Legionnaire's disease, collect **BOTH** a **respiratory** and a **urine specimen**.

Resources for testing patients with suspect LD:

- Centers for Disease Control and Prevention (CDC):
<https://www.cdc.gov/legionella/clinicians/diagnostic-testing.html>
- Washington State Department of Health:
<https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/NotifiableConditions/Legionellosis>

How do I collect a sputum specimen?

Sputum refers to secretions from the bronchi, lungs, and trachea in the lower respiratory tract. It does not refer to saliva in the mouth or post-nasal secretions. Sputum is always considered abnormal, because healthy people swallow bronchial secretions.

Supplies:

- Gloves
- Mask
- Tissue
- Laboratory requisition form
- Sterile cup with screw top lid that can hold at least 5ml of fluid
- Alcohol hand gel or access to handwashing sink with soap and water

Best practices tips:

- Obtain the specimen before starting or giving any antibiotic treatment.
- Obtain the sputum specimen early in the morning when the resident wakes
- Ensure that the patient does not brush their teeth or use mouthwash beforehand
- No food for one to two hours prior to specimen collection.
- Instruct the patient to rinse their mouth with water prior to specimen collection.
- Perform hand hygiene before and after the procedure.
- Wear a mask and gloves when obtaining the specimen.
- When coughing/spitting into the sterile cup, patient should avoid putting mouth or lips on the cup.
- While sputum samples do not typically need to be refrigerated, please check with your laboratory on their recommended collection and storage procedures.
- Ensure prompt transport of specimen to the laboratory so that testing is started as soon as possible.

Procedure for collecting a sputum specimen:

Procedure ²	Rationale
1. Follow proper infection control. Perform hand hygiene before and after the procedure and wearing a mask and gloves.	To prevent spread of germs. Since the patient may be symptomatic with respiratory symptoms, follow droplet precautions (e.g., mask and gloves) until diagnosis is known or patient is symptom-free.
2. Instruct patient to clear their nose by blowing nasal secretions into a tissue.	Do not want to collect of mucus or saliva in sputum specimen.
3. Instruct patient to swish water in their mouth and spit it out.	To minimize residual food particles, mouthwash, or oral drugs that might contaminate the specimen.
4. Have patient to sit at the edge of the bed or chair. You can also place them in high Fowler's* position if they are unable to sit up on their own. <i>*When the head of the bed is elevated as high as possible. The upper half of the patient's body is between 60 degrees and 90 degrees in relation to the lower half of their body.</i>	Positioning promotes collection of sputum.

Procedure⁷ (continued)	Rationale
5. Ask the resident to take three deep breaths slowly and then cough hard. Repeat this process until sputum is produced. Allow rest between attempts if needed.	By completely filling their lungs with maximal inspirations, more likely to collect a high quality sputum specimen.
6. Instruct patient to expectorate (cough or spit phlegm) into a sterile cup without touching lips or mouth to the container. Repeat the coughing process until 5mL of sputum are collected.	Avoid touching lips mouth to container to prevent specimen contamination. Need at least 5ml of sputum for more accurate results.
7. Provide tissue to patient to dry mouth and blow nose.	Coughing may have resulted in presence of sputum on lips and/or face and mucus may have collected in nose.
8. Place lid on container and ensure that it's closed.	Ensure that the container doesn't leak during transport.
9. Label container with pertinent patient information (e.g., patient name, date of collection, date of birth, medical record number).	Laboratories must have patient demographic information to perform test.
10. Remove gloves then clean hands with alcohol hand gel or washing with soap and water. Dispose of gloves in the garbage.	Remove gloves first because it is the type of personal protective equipment most likely to be contaminated.
11. Remove procedure mask by grabbing ear loop and slowly peeling away from face. Clean hands with alcohol hand gel or washing with soap and water. Dispose of mask in the garbage.	This is proper infection control procedure per the Centers for Disease Control and Prevention.
12. Offer patient hand gel or instruct them to perform handwashing with soap and water.	Patient's hands may have become contaminated during procedure.
13. Document completion of procedure, how patient tolerated the procedure, and the color, amount and consistency of sputum collected in the patient's chart.	Complete documentation is important so that specimen collection process is noted in the patient's medical record.
14. Per the laboratory protocol, complete any necessary laboratory requisition forms.	To ensure that the appropriate lab test is completed.
15. Store and transport the sputum specimen to the laboratory, per the laboratory's protocols.	Laboratory storage and transport protocols may vary.

I'm having trouble collecting a sputum specimen. What can I do?

If the patient is having trouble providing a sputum specimen, there are several ways⁷ to encourage sputum collection:

- Ensure patient is well-hydrated
- Deep breathing
- Have the patient drink warm water
- Have patient take a shower with warm water
- Nebulizer treatment
- Chest physiotherapy (i.e., chest percussion, postural draining) to improve the indirect removal of mucus from the breathing passages of a patient. This may require assistance from a physical therapist, physician, nurse practitioner, physician's assistant, or respiratory therapist.

A patient(s) in my long-term care facility was diagnosed with healthcare-associated Legionnaire's Disease. Should environmental samples be collected to look for *Legionella* in the environment?

Technical assistance with environmental assessment and sampling during outbreak investigations is available from public health. It is important to consult with [local public health](#) to determine if environmental sampling is appropriate. Environmental testing for Legionella, if indicated, should occur at a commercial Environmental Legionella Isolation Techniques Evaluation (ELITE) lab.

<https://www.cdc.gov/legionella/labs/elite.html>

Should cases of Legionellosis be reported to public health?

Yes, if one or more cases of Legionellosis are identified at your facility, local public health must be notified within 24 hours. For a list of local health jurisdictions, please visit:

<https://www.doh.wa.gov/AboutUs/PublicHealthSystem/LocalHealthJurisdictions>

Information about reporting Legionellosis:

<https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/NotifiableConditions/Legionellosis>

References

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