

*epi*TRENDS

A Monthly Bulletin on Epidemiology and Public Health Practice in Washington

October 2022 Volume 27, Number 10

Legionella and Water Management Plans

The key to preventing Legionnaires' disease is to reduce the risk of *Legionella* growth and spread. Building owners and operators can do this with a robust water management plan.

Background

Legionella bacteria occur naturally in freshwater environments like lakes but are rarely in sufficient quantities to cause an infection. The bacteria can become a concern when they grow and spread in human-made water systems. Water in man-made and plumbed systems favors the growth and spread of *Legionella*. If water in these systems does not flow smoothly, a few things may happen. Stagnation encourages the growth of biofilm, allows temperature to fall in the optimum range that supports the growth of *Legionella* (77°F-113°F), and also reduces disinfectant levels. Human-made water systems where *Legionella* can grow and spread include:

- Showerheads and sink faucets
- Cooling towers (structures that contain water and a fan as part of centralized air-cooling systems for buildings or industrial processes)
- Hot tubs
- Decorative fountains and water features
- Hot water tanks and heaters
- Large, complex plumbing systems



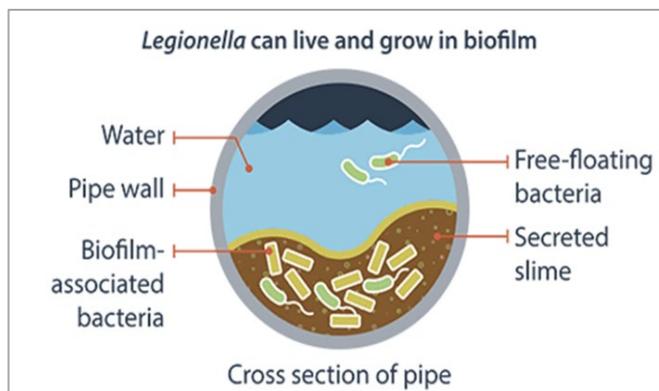
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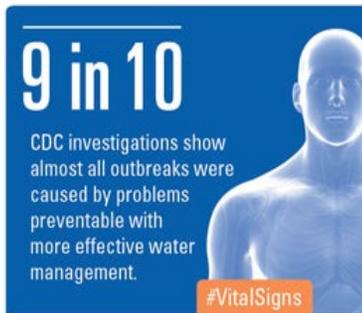
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Legionellosis

People can develop legionellosis by breathing in small droplets of water or accidentally swallowing water containing *Legionella* into the lungs. In general, people do not spread the disease to other



people. Legionellosis has two distinct clinical syndromes: Pontiac fever (incubation 24-72 hours), a self-limited flu-like illness without pneumonia; and Legionnaires' disease (incubation 2-10 days), a potentially fatal pneumonia with fever, cough, myalgias, malaise, and sometimes diarrhea.

Recently Washington had 60 to 80 cases reported annually, with about 10 percent of cases being fatal. The number of legionellosis cases has been on the increase since the early 2000s. While most cases are sporadic, legionellosis outbreaks can occur in settings with complex water systems like hotels, resorts, acute and long-term healthcare facilities, and cruise ships. In known outbreaks, rates are



low for Legionnaires' disease (CDC estimates that less than 5 percent of exposed persons develop Legionnaires' disease) but high for Pontiac Fever (over 90 percent). There is increased risk of disease for those who are older, have other medical problems, or who smoke.

What factors lead to Legionella growth in a building's water system?

A variety of factors both internal and external can lead to *Legionella* growth in a building's water system:

- Construction
- Water main break
- Changes in municipal water quality
- Fluctuation in water pH
- Water with temperature between 77°F-113°F
- Biofilm
- Inadequate disinfectants
- Stagnation

What should building owners do?

CDC has developed training and a toolkit to assist building owners with complex water systems (see Resources or links in the paragraph below). Before building owners and operators begin the training, they should the CDC [worksheet](#) to identify buildings at increased risk for *Legionella* growth and spread. This short survey has eight questions that help a building owners and operators assess whether their building or certain devices within their building need a water management program to reduce the risk of *Legionella* growth and spread. Once the CDC worksheet is completed, building owners and operators can take a free online [training](#) explaining how to create a water management plan. The training addresses the seven steps of a *Legionella* water management program. These seven steps, outlined in CDC's [Water Management Program toolkit](#), operationalize the ASHRAE 188 standard for minimizing the risk of Legionnaires' disease.

In general, the principles of effective water management include:

- Maintaining water temperatures outside the ideal range for *Legionella* growth
- Preventing water stagnation
- Ensuring adequate disinfection
- Maintaining devices to prevent sediment, scale, corrosion, and biofilm, all of which provide a habitat and nutrients for *Legionella*

Once established, water management programs require regular monitoring of key areas for potentially hazardous conditions and the use of predetermined responses to respond when control measures are not met.

What's included in the training?

These trainings outline how to reduce risk for *Legionella* growth and transmission in facilities through water management programs. The training also helps water management programs align with ASHRAE 188 on reducing risk for *Legionella* in building water systems. The resources are free and available online. The training also provides continuing education units from the National Environmental Health Association (NEHA).

These resources support use of a common language across the range of professionals involved in water management programs. Included are case studies, templates, and other practical resources to reduce the risk for *Legionella* growth and to protect those at increased risk of Legionnaires' disease: adults aged 50 years or older, current, or former smokers, and those with a weakened immune system or chronic disease.

Is Legionella a concern in homes?

Public water utilities must provide water that meets certain quality and safety standards for drinking purposes. However, tap water is not sterile, meaning it might contain waterborne germs like *Legionella*. When these germs get into the pipes inside a home or building, they could grow and multiply if the conditions are right. CDC provides information on [how to prevent waterborne germs at home](#).

Public health response during outbreak investigations

The Washington State Department of Health can assist local health jurisdictions during suspected outbreaks. In a cluster or healthcare investigation, several sections within Department of Health, including Office of Communicable Disease Epidemiology, Division of Environmental Public Health (EPH), and Division of Health Services Quality Assurance, may work together with the local health jurisdiction to investigate and respond. EPH can assist with environmental assessments and sampling. The Washington State Public Health Laboratories (PHL) were certified as an Environmental *Legionella* Isolation Techniques Evaluation (ELITE) lab to test environmental specimens for *Legionella*. In addition, environmental isolates and clinical isolates from suspected outbreaks can be sent to PHL for genetic fingerprinting. This ability to match patient and environmental isolates underscores the importance of doing respiratory specimen cultures and not just urine antigen testing for cases of suspected legionellosis.

Resources

CDC worksheet to identify buildings at increased risk:

<https://www.cdc.gov/legionella/wmp/toolkit/wmp-risk.html>

CDC training on *Legionella* water management programs:

<https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html>

CDC toolkit to develop a water management program:

<https://www.cdc.gov/legionella/wmp/toolkit/index.html>

CDC home waterborne germ prevention guidance:

<https://www.cdc.gov/healthywater/drinking/preventing-waterborne-germs-at-home.html>

DOH surveillance and investigation guideline:

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

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

