

# *epi*TRENDS

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## ***Legionnaires' Disease and Safe Building Reopening***

As if we need more things to worry about in 2020, *Legionella* bacteria could be lurking in the pipes of closed buildings. Safe reopening of closed buildings is important to prevent illnesses.

### ***Background***

Many buildings in Washington State have had temporary closures or reduced occupation due to the COVID-19 pandemic. Exposure to *Legionella* could occur through water system usage of reopened of buildings after a dormant period of weeks to months. *Legionella* and other opportunistic waterborne pathogens flourish in the water systems of vacant or under-used buildings due to stagnant water, cooling of hot water lines to below 122°F, and biofilm development. As buildings are reopened for in-person business, there is a risk of exposure to these pathogens to building occupants through water systems.



Safe building reopening is paramount in reducing the risk of exposure to *Legionella* and other opportunistic waterborne pathogens. Building owners should be made aware of safe building reopening guidance, including flushing the water systems ahead of reopening. Following the guidance can prevent waterborne infections.

### ***Reopening Buildings***

People with health conditions that increase the risk of pneumonia, such as a weakened immune system, should consult a clinician before participating in water system rehabilitation activities that could produce aerosols. Use of an N95 respirator along with a comprehensive respiratory protection program may be needed for people working in enclosed spaces with aerosol production.



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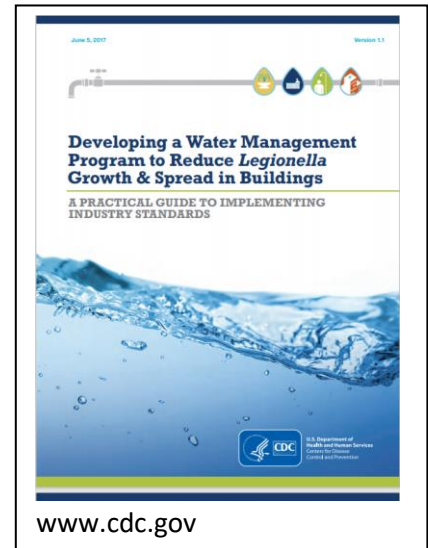
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Using water systems that have not been used for weeks or months may result in exposure to *Legionella*. According to the Centers for Disease Control and Prevention (CDC) there are eight steps to follow when reopening a building to minimize the risk of *Legionella* exposure.

1. Develop a comprehensive water management program (WMP) for the water system and all devices that use water from the system.
2. Ensure the water heater is properly maintained and the temperature is correctly set.
3. Flush the water system.
4. Clean all decorative water features, such as fountains.
5. Ensure hot tubs/spas are safe for use.
6. Ensure cooling towers are cleaned and well-maintained.
7. Ensure safety equipment including fire sprinkler systems, eye wash stations, and safety showers are cleaned and well-maintained.
8. Maintain the water system after reopening.



Building owners and operators can customize their safe reopening based on their facility type and seek more specific directions through the Resources included below.

### **Legionellosis**

Legionellosis is a bacterial respiratory infection which can cause severe pneumonia and death. Most cases are sporadic, but outbreaks can occur in hotels, communities, acute and long-term healthcare facilities, cruise ships, and other settings. In identified outbreaks attack 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).

Symptoms of Legionnaires' disease, such as fever, cough, and shortness of breath, may mimic symptoms of COVID-19. This could lead to a delay proper diagnostic testing and identification of infection with *Legionella*. There are 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 progressing to pneumonia. Recently Washington had 50 to 70 cases reported annually, with about 10 percent of cases being fatal. Centers for Disease Control and Prevention (CDC) suggests healthcare providers should suspect legionellosis and order *Legionella*-specific testing (urine antigen and respiratory specimen culture) on any:

- Patient with a consistent illness who has failed antibiotic therapy
- Patient with severe pneumonia, in particular those requiring intensive care
- Immunocompromised patient with pneumonia
- Patient with pneumonia in the setting of a legionellosis outbreak
- Patient with a travel history in the exposure period
- Patient suspected of having healthcare-associated pneumonia

Guidelines on management of community-acquired and hospital-acquired pneumonias including those due to *Legionella* and information for clinicians about legionellosis are in Resources.

### Identifying and Preventing Exposures to Legionella

Exposure is through inhaling aerosolized water contaminated with *Legionella*. The bacteria occur commonly in natural or artificial freshwater environments but are rarely in sufficient quantities to cause an infection. Factors that allow the bacteria to amplify include higher water temperatures (77-108°F), stagnation, sediments, biofilms, and the presence of amoebae.

Risk factors for exposure to *Legionella* include recent travel with an overnight stay outside of the home, exposure to whirlpool spas, and maintenance work on domestic plumbing. Legionellosis outbreaks have been associated with potable water systems, whirlpool spas, and cooling towers. Such sources promote both bacterial amplification and aerosolization of contaminated water.

A local health jurisdiction notified of a legionellosis case does a detailed patient interview, with information collated at state and federal levels, and commonalities in exposures investigated as indicated. See the Washington State Department of Health legionellosis guideline (Resources). Subsequent investigation of cases may lead to identification of an environmental source of *Legionella* where other susceptible persons are at risk of exposure. In Washington over the past decade there were several dozen legionellosis cases and several associated deaths reported each year. Greater awareness and testing may result in more cases being diagnosed.

CDC recommends water management programs for primary prevention of legionellosis and other waterborne illnesses (see Resources). CDC maintains extensive information regarding environmental testing for *Legionella* and certifies select sites as Environmental *Legionella* Isolation Techniques Evaluation (ELITE) laboratories. Washington State Public Health Laboratories (PHL) was certified as an ELITE lab to test environmental specimens for *Legionella* after approval from local health jurisdictions. In addition, environmental isolates and clinical isolates from suspected outbreaks can be sent to CDC 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.

In a cluster or healthcare investigation, several sections within Department of Health, including Office of Communicable Disease Epidemiology, Division of Environmental Public Health, and Division of Health Services Quality Assurance, may work together with the local health jurisdiction to investigate and respond.

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 *Legionella* isolates to PHL within two business days. By rapidly identifying cluster of cases, public health agencies can recognize, investigate and terminate outbreaks of legionellosis.

#### Where can *Legionella* grow and/or spread?

*Legionella* can grow in many parts of building water systems that are continually wet, and certain devices can then spread contaminated water droplets. Examples include:

- Hot and cold water storage tanks
- Water heaters
- Water-hammer arrestors
- Expansion tanks
- Water filters
- Electronic and manual faucets\*
- Aerators
- Faucet flow restrictors
- Showerheads\* and hoses
- Pipes, valves, and fittings
- Centrally-installed misters\*, atomizers\*, air washers\*, and humidifiers\*
- Nonsteam aerosol-generating humidifiers\*
- Infrequently used equipment, including eyewash stations\*
- Ice machines\*
- Hot tubs\*
- Decorative fountains\*
- Cooling towers\*
- Medical devices\* (such as CPAP machines, hydrotherapy equipment, bronchoscopes)

\*These devices can spread *Legionella* through aerosols or aspiration

## Resources

CDC guidance for reopening buildings: <https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html>

DOH COVID-19 Guidance for *Legionella* and Building Water System Closures: <https://www.doh.wa.gov/Portals/1/Documents/1600/coronavirus/LegionellaandBuildingWaterSystemClosuresCOVID-19.pdf>

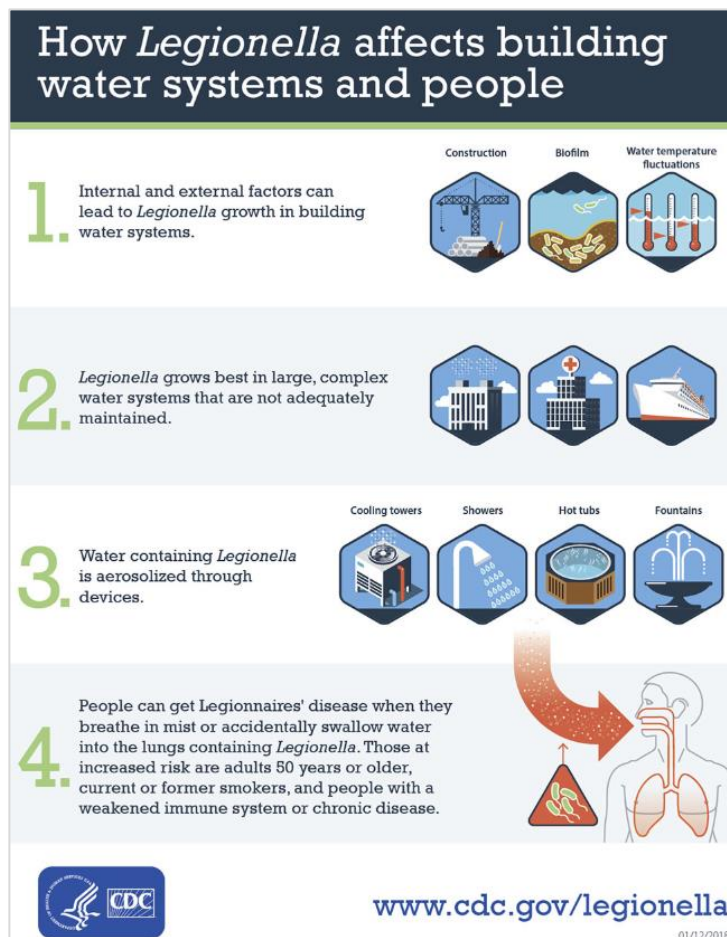
International Association of Plumbing and Mechanical Officials (IAPMO) “After COVID-19” webinar series: <https://www.iapmo.org/webinars/covid-19-webinar-series/>

ASHRAE school reopening guidance: <https://www.ashrae.org/file%20library/technical%20resources/covid-19/guidance-for-the-re-opening-of-schools.pdf>

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

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

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



<https://www.cdc.gov/legionella/infographics/legionella-affects-water-systems.html>