



BEST PRACTICES

WATER MANAGEMENT TO PREVENT LEGIONNAIRES' DISEASE IN REOPENED BUILDINGS

As stay at home restrictions start to ease nationwide, buildings, and facilities that temporarily idled will be going back into service. Health risks may lurk within our shuttered manufacturing plants, office buildings, schools, hotels, or restaurants, so a safety-first approach for employees and customers will be critical for public health. Any business or facility that uses water to support employees and/or operations has another potential health exposure akin to COVID-19, that has potentially been growing during the shutdown.

Legionnaires' disease is a severe type of lung infection caused by Legionella bacteria. It can cause Pneumonia type symptoms, similar to COVID-19. According to the CDC, health departments in the United States reported around 10,000 cases of the disease in 2018 but also feel that number may underestimate since the true incidence because the disease is likely often undiagnosed. About 1 in 10 people who get Legionnaires' disease will die. The disease is not spread person-to-person except in very rare occurrences.

Legionella must grow before it can be aerosolized, turning it into a health hazard. The disease is typically contracted when people breathe in the small droplets of water that contain the bacteria. It is uncommon for people to get sick by drinking the water unless it accidentally reaches their lungs. While there are no vaccines that can prevent Legionnaires' disease, it can be treated with antibiotics.

WHAT FACTORS WITHIN BUILDINGS AND SYSTEMS CAN LEAD TO LEGIONELLA GROWTH?

- Biofilm and scale due to water pressure changes and vibration from construction activities
- Materials introduced into central water systems through main breaks or service additions
- Biofilm, scale and sediment buildup
- This buildup can protect Legionella bacteria from heat and disinfectant, providing food and shelter for it to grow
- Use of disinfectants outside of the recommended pH range of 6.5–8.5
- Water temperature fluctuations, especially temperature drops below 110°F; Legionella grows best between 77°F–108°F

THE SHUTDOWN PERIOD INTRODUCED WATER STAGNATION, WHICH ENCOURAGES BIOFILM GROWTH, REDUCES TEMPERATURE AND LOWERS THE LEVELS OF DISINFECTANT INTRODUCED INTO THE WATER, CREATING IDEAL CONDITIONS FOR LEGIONELLA.

WHERE CAN LEGIONELLA GROW AND/OR SPREAD?

The bacteria can grow in building water systems that are continually wet, such as:

- Hot and cold water storage tanks
- Water heaters
- Expansion tanks
- Water filters
- Pipes, valves and fittings
- Aerators
- Hoses

Any devices that can spread contaminated water droplets:

- Equipment that creates an aerosol spray
- Manual and electronic faucets
- Showerheads
- Centrally installed misters and humidifiers
- Ice machines
- Decorative fountains
- Cooling towers
- Hot tubs
- Eyewash stations
- Infrequently used equipment that stores or holds stagnant water

HOW TO INHIBIT LEGIONELLA GROWTH

Water system management programs and maintenance are the keys to preventing Legionella bacteria growth and spread, in both active buildings and those after planned or unplanned prolonged shutdown. The CDC recommends eight steps to take before your business or building reopens:

1. Develop a comprehensive water management program (WMP) for your water system and all devices that use water. Guidance to help with this process is available from the CDC and others.

a. Water Management Program Toolkit [\[Link\]](#)

This toolkit is designed to help people understand which buildings and devices need a Legionella water management program to reduce the risk of Legionnaires' disease, what makes a good program and how to develop a program.

b. Preventing Legionnaires' Disease: A Training on Legionella Water Management Programs (PreventLD Training) [\[Link\]](#)

Take this training from CDC and partners on creating a water management program to reduce the risk of Legionnaires' disease. PreventLD Training aligns with industry standards on managing the risk of Legionella bacteria.

c. Hotel Guidance [\[Link\]](#)

Considerations for Hotel Owners and Managers: How to Prevent Legionnaires' Disease

d. Operating Public Hot Tubs for pool staff and owners [\[Link\]](#)

e. From Plumbing to Patients [\[Link\]](#)

Water management programs in healthcare facilities are an important way to help protect vulnerable patient populations as well as staff and visitors.

f. Preventing Occupational Exposure to Legionella [\[Link\]](#)

**CDC INVESTIGATIONS INTO
LEGIONELLA OUTBREAKS
SHOW THAT 9 IN 10 WERE
CAUSED BY PROBLEMS
THAT WERE PREVENTABLE
WITH MORE EFFECTIVE
WATER MANAGEMENT
PROGRAMS.**

2. Ensure water heaters are correctly maintained and that the temperature is set correctly

- a. Determine if the manufacturer recommends draining the water heater after a prolonged period of disuse.
- b. Ensure that all maintenance activities are carried out according to the manufacturer's instructions or by professionals.
- c. Set the water heater temperature to at least 120°F

Ensure that you take measures to prevent scalding if the water heater is set to >130°F

3. Flush the water system

- a. Flush hot and cold water through all points of use (e.g., showers, sink faucets) to replace all water inside building piping with fresh water.

Flushing may need to occur in segments (e.g., floors or individual rooms) due to facility size and water pressure.

Flush until the hot water reaches its maximum temperature

4. Clean all decorative water features, such as fountains

- a. Be sure to follow any recommended manufacturer guidelines for cleaning
- b. Ensure that decorative water features are free of visible slime or biofilm
- c. After the water feature has been re-filled, measure disinfectant levels to ensure that the water is safe for use

5. Ensure hot tubs/spas are safe for use

- a. Check for any existing guidelines from local or state regulatory agency before use
- b. Ensure that hot tubs/spas are free of visible slime or biofilm before filling with water
- c. Perform a hot tub/spa disinfection procedure before use
CDC Guidance (follow Steps 4–9 and 12–13) [\[Link\]](#)
- d. Facilities may decide to test the hot tub/spa for Legionella before returning to service if previous device maintenance logs, bacterial testing results, or associated cases of Legionnaires' disease indicate an elevated level of risk to occupants.
- e. All Legionella testing decisions should be made in consultation with water management program staff along with relevant public health authorities.



6. Ensure cooling towers are clean and well-maintained

a. Ensure that cooling towers are maintained (including start-up and shutdown procedures) per manufacturer's guidelines and industry best practices

b. Ensure that the tower and basin are free of visible slime or biofilm before use

If the tower appears well-maintained, perform an online disinfection procedure

Guidance on disinfection procedures from the Cooling Technology Institute [\[Link\]](#)

7. Ensure safety equipment including fire sprinkler systems, eyewash stations, and safety showers are clean and well-maintained

a. Regularly flush, clean, and disinfect these systems according to manufacturers' specifications.

8. Perform maintenance on the water system

a. Consider contacting local water utility to learn about any recent disruptions in the water supply.

This could include working with the local water utility to ensure that standard checkpoints near the building or at the meter to the building have recently been checked or request that disinfectant residual entering the building meets expected standards.

After the water system has returned to normal, ensure that the risk of Legionella growth is minimized by regularly checking water quality parameters such as temperature, pH, and disinfectant levels.

Follow your water management program, document activities, and promptly intervene when problems arise.

As buildings and businesses work to reopen, employee safety will be paramount. Legionella is 100% preventable by following CDC guidelines for preparing and maintaining a safe water system within buildings. The unintended consequences of not maintaining or failing to prepare critical water systems can be serious. For more details, please see the guidance about reopening your building safely.



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