

Legionella Information

FOR COMMUNITY PUBLIC WATER SYSTEMS (CPWSs), HEALTH CARE FACILITIES, AND ALL TYPES OF BUILDINGS

What is *Legionella*?

Legionella is a bacterium commonly found in natural and man-made aquatic environments. *Legionella* can be found at low concentrations in any public water system. *Legionella* only poses a health risk when growth occurs in warm stagnant water, the water is aerosolized, and the small droplets are inhaled. *Legionella* generally does not pose a health risk if a person drinks the water. Those that are infected may develop legionellosis, a type of pneumonia called Legionnaires' disease, or a flu-like illness called Pontiac fever. There has been an increase in Legionnaires' disease cases nationwide and in Minnesota, with 17 confirmed cases in 2004 and 115 cases in 2016.

The risk to people depends on many factors, including:

1. Amplification or growth of *Legionella*.
 - Conditions such as water temperatures between 77°F and 108°F, stagnation, and the presence of scale, sediment, biofilm, and protozoa promote amplification of *Legionella*.
2. Aerosolization of colonized water.
 - Common modes of aerosolization include showers and faucets, cooling towers, hot tubs, and decorative fountains and water features.
3. Size of the water droplets.
4. Strain of *Legionella*.
5. Susceptibility of exposed individual.
 - Those who are over 50 years of age, are male, smoke, have chronic lung disease, and/or are immunocompromised or immunosuppressed are more susceptible.

According to the Centers for Disease Control and Prevention (CDC), about 5,000 cases of Legionnaires' disease are reported each year in the United States, and one out of every 10 people who get Legionnaires' disease will die.

Requirements for Health Care Facilities

The Centers for Medicare and Medicaid Services (CMS) published a directive regarding *Legionella* risk reduction in June 2017: [Requirement to Reduce Legionella Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease \(LD\)](https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-17-30.pdf) (<https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-17-30.pdf>).

This directive requires all Medicare-certified nursing homes, hospitals, and critical access hospitals to have water management policies and procedures to reduce the risk of growth and

spread of Legionella and other opportunistic pathogens in building water systems. MDH Health Regulation Division surveyors are following/implementing the above federal CMS guidelines with healthcare facilities as part of federal on-site surveys.

Information for All Types of Buildings, Including Health Care Facilities

Resources for Developing a Water Management Plan

CDC has several different resources that can be used to develop a water management plan:

- [Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings](https://www.cdc.gov/legionella/downloads/toolkit.pdf) (<https://www.cdc.gov/legionella/downloads/toolkit.pdf>)
- [Considerations When Working with Legionella Consultants](https://www.cdc.gov/legionella/maintenance/consultant-considerations.html) (<https://www.cdc.gov/legionella/maintenance/consultant-considerations.html>)
- [Worksheet to Identify Buildings at Increased Risk for Legionella Growth and Spread](https://www.cdc.gov/legionella/maintenance/wmp-risk.html) (<https://www.cdc.gov/legionella/maintenance/wmp-risk.html>)
- NSF International Protocol – NSF P453, Cooling Tower Water Systems
<http://www.nsf.org/newsroom/webinar-nsf-p453-a-new-protocol-on-cooling-tower-water-systems>

What to Consider When Developing a Water Management Plan

Owners and managers of buildings and facilities should consider the following action items. These are items to consider and are not formal guidance. Consideration should also be given to cross-connection control and conservation when developing any water management plan.

- Regularly flush plumbing where water may be stagnant, warm, and/or aerosolized.
- Clean cooling towers on a regular basis.
- If monitoring water quality, measure temperature, pH, and free and total chlorine residuals. Measuring total chlorine residual may be adequate for most facilities.
- Regular sampling is important and can occur weekly, on the same day, same time, at designated locations. It is important to do monitoring using a consistent protocol, and if possible by the same person(s) each time. Water quality should be monitored where water enters the facility, and in high risk (low water usage, prior to aerosolization, and special use taps) and low risk locations.
 - This recorded information should be used to notice any changes in water quality results. Any significant variation from typical results should be investigated and remediated immediately.
 - An approved method for testing chlorine residuals in drinking water is the N,N Diethyl-1,4 Phenylendiamine (DPD) indicator test method. A color comparator disc, digital test, pocket colorimeter, or kit are recommended for chlorine measurements. Chlorine test kits for swimming pools are not approved for drinking water testing. Instructions for use of these test kits are relatively simple,

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including: keep test kit in good condition and ensure reagents are not expired. Manufacturer's videos are also available on proper use of this equipment.

- Since there is no single recommended minimum standard for chlorine residuals in building plumbing, tracking water quality trends serves as an effective tool in identifying when water quality exceeds normal variations and when action is needed (see CDC resources above).
- Remove dead ends in the plumbing system.
- Increase water temperature and add anti-scalding valves.

After considering the items above, you may also consider the following:

- Treatment at the entry point to the building or at points of use. Treatment should be considered carefully as it may create other health risks, i.e. elevated lead and copper concentrations, disinfection by-products, and/or point of use maintenance failures. If treatment is added, the facility may be considered an individual public water system and subject to additional requirements under the federal Safe Drinking Water Act.
- Regular testing for the *Legionella* bacteria. Regular testing can be used to monitor baseline levels of *Legionella*. Sporadic testing for *Legionella* may not be useful. Regular monitoring for temperature, chlorine residuals, and pH is a more useful general management tool.

ASHRAE Guideline 12-2000, Minimizing the Risk of Legionellosis Associated with Building Water Systems, provides information summarized below:

- Presence of *Legionella* cannot be directly equated to the risk of infection.
- Interpretation of the results of culturing the water is confounded by use of different bacteriologic methods in various laboratories, by variable culture results among sites sampled within a water system and by fluctuations in the concentration of *Legionella* isolated from a single site.
- The risk of illness following exposure to a given source is influenced by a number of factors other than the concentration of organisms in a sample.
- Test results only represent the counts at the time the sample was collected. A negative result from such a sample is likely to lead to a false sense of security because any amplifier can quickly become heavily colonized if it suffers neglect.

These and other factors are a concern during an incident response. MDH does not collect or generally recommend collecting *Legionella* bacteria samples until the potential source(s) of the incident are identified.

It's important to keep in regular contact with your CPWS when developing and implementing a water management plan. Your CPWS can provide current and historical water quality data and plans for future water quality changes that will help develop a strong and effective water management plan. A best management practice is to have a good working relationship with all partners in place before a public health incident.

Information for Community Public Water Systems

CPWSs may contact their MDH District Engineer for information on best practices to help minimize the potential for *Legionella* growth. These may include:

- Maintaining a total chlorine residual of at least 1 mg/L, or a free chlorine residual of at least 0.2-0.5 mg/L, at the point where water enters the facility or building to minimize biofilm growth (for systems that chlorinate).
- Preventing low flow and stagnant water, and eliminating dead-end water mains.
- Properly flushing the distribution system regularly to reduce sediment and scale build up. It is recommended that customers also flush the plumbing lines for their individual homes or businesses after the PWS distribution system is flushed.

What happens when a case of legionellosis is associated with a facility?

MDH will contact the owner or manager of the building or facility, the CPWS, and local public health response partners. These partners will then work together to identify the potential source(s), share and communicate information, and remediate the potential source(s).

For More Information

CDC and CMS resources:

- [Legionella \(Legionnaires' Disease and Pontiac Fever\)](https://www.cdc.gov/legionella/index.html)
(<https://www.cdc.gov/legionella/index.html>)
- [CMS Legionella and Other Waterborne Pathogens Webinar](https://surveyortraining.cms.hhs.gov/pubs/VideoInformation.aspx?id=134&cid=0CMSLEGWEB-Archived)
(<https://surveyortraining.cms.hhs.gov/pubs/VideoInformation.aspx?id=134&cid=0CMSLEGWEB-Archived>)

MDH contacts:

- Health Regulation Division at 651-201-4101, as related to Health Care Facilities
- Drinking Water Protection Section at 651-201-4700
- Infectious Disease Epidemiology, Prevention and Control Division at 651-201-5414

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To obtain this information in a different format, call 651-201-4700. Printed on recycled paper.