Maryland
Department of the Environment

Healthy Home, Safe Water:

A Legionella Prevention Guide for Maryland Homeowners

Introduction

Welcome to the *Legionella* Prevention Guide for Maryland Homeowners! This guide is here to help you protect your family from *Legionella* bacteria and keep your home healthy and safe. Maryland's Department of the Environment is committed to safeguarding public health and promoting awareness of preventable diseases. Legionnaires' disease is a serious respiratory illness that can affect anyone, but some people are at increased risk for Legionnaires' disease*,* including current and former smokers, people 50 years or older, and people with specific health issues or conditions. While *Legionella* bacteria often grow best in **complex water systems,** such as those found in hotels, healthcare facilities, and other large buildings, we must note that there is still a risk of exposure in other settings, including the home.

Understanding *Legionella*

Legionnaires' disease is a severe form of pneumonia or lung infection, caused by exposure to a specific type of Legionella bacteria (*L. Pneumophila*), which is commonly found in warm water environments. *Legionella* bacteria can exist in soil and water in outdoor environments, rarely causing infections. However, when aerosolized (*taking the form of a fine spray*) these bacteria can be inhaled, leading to respiratory illnesses such as Legionnaires' disease and Pontiac fever. *Legionella* is different from typical waterborne pathogens in that the route of exposure is inhalation rather than ingestion. Unlike Flu or COVID-19, Legionnaires' disease **is not typically spread from person to person.** Therefore, preventing *Legionella* outbreaks involves controlling and maintaining the water systems where the bacteria can grow, rather than focusing on person-to-person transmission routes.

Growth Conditions

Conditions that help *Legionella* grow include: inadequate levels of disinfectant (e.g., chlorine); presence of sediment, scale, or biofilm; slowly moving or stagnant water; and warm temperatures. The bacteria can spread through mist from various sources, including, but not limited to:

- **Hot tubs and whirlpools:** Warm water environments provide a perfect breeding ground for *Legionella.*
- **Spas and Jacuzzis:** Similar to hot tubs, warm water in spas can harbor *Legionella*
- **Showers:** The aerosolization of water droplets during showering can potentially spread *Legionella* if the water system is contaminated.
- **Decorative Fountains:** Standing water in decorative fountains, if not properly treated, can also harbor *Legionella* bacteria.

Health Risks and Symptoms

Legionnaires' disease typically presents with symptoms like high fever, chills, cough, muscle aches, headache, and difficulty breathing. In severe cases, it can lead to complications like respiratory failure or even death.

Pontiac fever, on the other hand, is milder and resembles flu-like symptoms such as fever, headache, muscle aches, and fatigue.

While Pontiac fever is usually resolved without treatment, *Legionnaires'* disease requires immediate medical attention, including antibiotics. To stay safe, it is important to recognize these symptoms early and seek medical care if you or someone you know experiences them, especially after exposure to potential sources of *Legionella*, such as hot tubs, showers, cooling towers, or decorative fountains. Home air conditioners are typically not at risk because they do not use water to cool the air. However, being aware of these risks can help protect individual and public health.

Prevention Tips for a Healthy Home

Cleaning & Maintenance

Proper maintenance of water systems is essential in preventing the growth and spread of *Legionella* bacteria, which can cause Legionnaires' disease. One key aspect of this maintenance is managing fixtures that store or distribute water, particularly in areas where water can become stagnant or where mineral buildup can occur.

- **Turn off and drain garden hoses** when not in use for extended periods, especially off-season, to prevent water stagnation and bacterial growth
- **Clean and disinfect water-related devices**, such as humidifiers and filter, following the manufacturer's instructions to reduce bacterial buildup
- **Descale shower heads and hoses at least once every three months.** Mineral deposits (scale) from hard water can accumulate on internal and external surfaces of showerheads and hoses, creating an ideal environment for *Legionella* to grow. To descale, remove the showerhead and soak in a solution of equal parts white vinegar and water for 30-60 minutes, then scrub with a brush to remove residue. For handheld shower hoses, flush them thoroughly with the same solution, or replace them periodically if internal buildup is difficult to remove.
- Maintain all components of the water system regularly, including thermostatic mixing valves, aerators, filters, and storage tanks. These components help regulate water temperature and flow, but they can also harbor bacteria if not properly cleaned and maintained. [1]

Hot tubs:

Monitor and maintain adequate disinfectant levels, even when the hot tub isn't in use. All hot tubs–including display models– should be operated with proper disinfectant residuals and pH.

- CDC recommends the following levels of disinfection:
    - pH: 7.2 - 7.8

[1] Please visit (https://www.cdc.gov/control-legionella/php/toolkit/control-toolkit.html) for more information about controlling *Legionella* in common sources of exposure)

    - Free chlorine: 3 - 10 ppm
    - Bromine: 4-8 ppm
- Ensure easy access to all mechanical and filtration components for routine and preventive maintenance and service
- Ensure the hot tub basin can be easily, quickly, and completely drained and refilled and is suitable for regular scrubbing and cleaning
- Consider locating indoor hot tubs in rooms with isolated air handlers and dehumidifiers

Follow manufacturer recommendations for:

- Cleaning or scrubbing the hot tub
- Replacing the filter and water
- Practicing all other maintenance activities

Consider installing an automatic disinfectant system for the hot tub rather than hand feeding disinfectant.

Unoccupied rooms/properties

Low or irregular occupancy decreases water flow and can decrease disinfectant levels in water.

- If faucets or shower heads haven't been used for a week or more, run water from both hot and cold supplies for 3 minutes each
- When moving into a new home or returning to an unoccupied property after travel, run all taps continuously for at least 5 minutes to flush out any bacteria

Decorative fountains

All decorative fountains produce aerosols. Safe operation and regular decorative fountain maintenance protect families from exposure to *Legionella*. The frequency of these activities depends on the environmental conditions present in the area where the decorative fountain is located and its design. Operate and maintain all fountains according to manufacturer recommendations with the following guidelines in mind:

- Follow manufacturer recommendations

- Do not operate decorative fountains in areas intended for use by persons at increased risk of *Legionnaires'* disease
- Monitor critical water parameters, like temperature and disinfectant residual, at least weekly.
- Automate disinfectant feed and monitoring systems, if possible.
- Apply algaecide as needed.
- Avoid prolonged idle periods and run decorative fountains at least daily
- Immediately clean and disinfect if cloudy water, visible debris, algae, biofilm, or foul odors are present

Factors that can increase the water temperature into the range favorable for *Legionella* growth (77-113°F) include:

- Exposure to warm air
- Heat-generating submerged lights.

Additional strategies for controlling *Legionella*, such as adding disinfectant, will be required.

Plumbing

Premise plumbing is defined as the portion of a water system, including both hot and cold water, various devices (e.g., hot water heater), fixtures (e.g. showers, faucets), and drains (e.g., sinks, toilets) connected to the main distribution system via service lines. Water quality within premise plumbing is not monitored by EPA regulations, except for the Lead and Copper Rule. Without proper maintenance and temperature control, these plumbing systems can become reservoirs for *Legionella,* increasing the risk of exposure and potential infection for occupants.

- Remove dead legs (sections of water piping systems where damage or other influences have stopped the flow of water) in your pipes
- Regularly flushing out infrequently used outlets, like shower heads and taps, at least once a week can help prevent *Legionella* growth

Water Temperature

Legionella bacteria cannot survive at extreme temperatures, offering a promising avenue for prevention. While chemical treatments are often promoted as effective *Legionella* deterrents, adjusting water temperature can be a more sustainable and efficient solution**.** *Legionella* grows best between 77°F-113°F (25°C- 45°C). To prevent the growth of *Legionella* in a water heater, the CDC recommends:

- Store hot water above 140°F (60°C) and ensure hot water in circulation does not fall below 120°F (49°C). Recirculate hot water continuously, if possible.
- Store and circulate cold water at temperatures below the favorable range for *Legionella* (77-113°F, 25-45°C). However, the CDC notes that *Legionella* may grow at temperatures as low as 68°F (20°C).
- Install thermostatic mixing valves as close as possible to water fixtures to prevent scalding while permitting circulating hot water temperatures above 120°F (49°C)
- Use appropriately sized hot and cold water storage tanks fitted with recirculating pumps to maintain flow and avoid unfavorable temperature gradients.
- Regularly drain and flush your hot water tank every 6-12 months, ensuring all water reaches the required temperature

Private Well Water

Private well owners are responsible for testing the quality of and maintaining their drinking water wells.However, it is important to note that *Legionella* bacteria generally do not thrive in the cool temperatures found in groundwater. Because of this, routine testing for *Legionella* in private wells is not usually necessary unless there are specific risk factors or concerns. For information and assistance on well construction, maintenance, water quality, and treatment issues, contact:

- Your state or local health department
- University of Maryland Extension website
- A private well contractor

Conclusion

To keep your home safe from *Legionella* bacteria, it's important to take some simple precautions. By understanding the risk factors and following these tips, you can help keep your home healthier and safer. Staying informed and taking action are the best ways to protect yourself and your family from *Legionella* bacteria.

- **Regular Maintenance:** Clean your fixtures and flush out water that's been sitting still for a while. This helps stop bacteria from growing.
- **Monitor Water Temperature:** Keep your water heater at a high enough temperature to kill bacteria. Store hot water above 140°F (60°C) and ensure hot water in circulation does not fall below 120°F (49°C). Recirculate hot water continuously, if possible.
- **Disinfection Methods:** Consider using chemical treatments to kill bacteria and make sure everything is clean.
- For additional questions regarding Legionnaires' disease, please feel free to contact your local health department at your earliest convenience.

Appendix

For more information regarding this topic, we recommend exploring the following resources:

- Maryland Department of Health (MDH)
  - Legionnaires' Disease Fact Sheet
- CDC
  - Controlling Legionella
  - Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings
  - Vacation Rental Owners and Managers
  - Identifying Buildings with Increased Legionella Risk
  - Control Legionella in Decorative Fountains
  - *Legionella* Training
- WHO
  - Legionellosis (fact sheet)