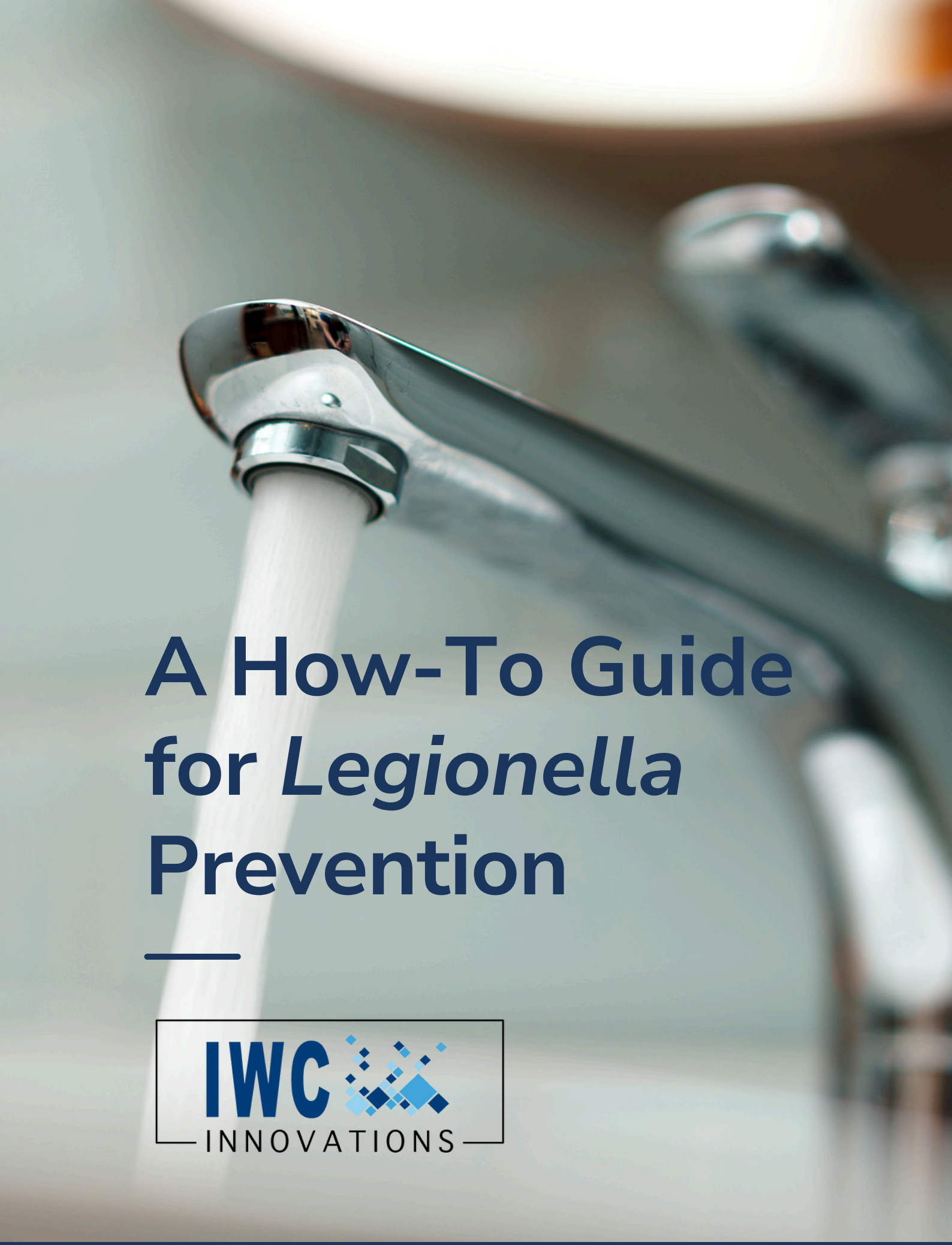

A How-To Guide for *Legionella* Prevention

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WHAT IS LEGIONELLA?

Legionella are a group of bacteria that can cause a serious lung infection (pneumonia) called Legionnaires' disease. There are about 60 different species of *Legionella* bacteria, with *Legionella pneumophila* as the species most likely to cause disease. It's usually found in water, like in hot tubs, cooling towers, or plumbing systems, and grows fast in warm conditions if the water isn't treated properly. The name *Legionella* comes from a significant outbreak in 1976 at an American Legion convention (military veterans service organization), where many people got sick from this bacteria.

WHERE ARE *LEGIONELLA* FOUND?

Legionella bacteria naturally occur in freshwater environments such as rivers and lakes, but they often thrive in man-made systems like hot water tanks, cooling towers, and showerheads. These warm, damp environments, especially when water temperatures range between 68°F and 113°F (20°C to 45°C), create ideal conditions for *Legionella* to grow. Without proper cleaning and maintenance, these systems can become breeding grounds for the bacteria, posing serious health risks.

HOW DO YOU PREVENT *LEGIONELLA* GROWTH AND SPREAD?

To prevent *Legionella*, control the conditions where it thrives—warm, stagnant water between 68°F and 113°F. Here's how:

- **Control Temperatures:** Keep cold water below 68°F and hot water above 140°F at the heater.
- **Keep Water Moving:** Flush unused outlets and eliminate dead legs in piping.This activity will help minimize growth concentration.
- **Clean Equipment:** Regularly clean and disinfect cooling towers, hot tubs, and water tanks.
- **Use Biocides:** Apply biocides and anti-scaling chemicals through a proper cooling tower chemical treatment system.
- **Test Regularly:** Sample high-risk areas like cooling towers and hot water systems to detect *Legionella* early.
- **Follow a Water Management Plan:** Use a site-specific plan based on ASHRAE Standard 188 to manage risks.

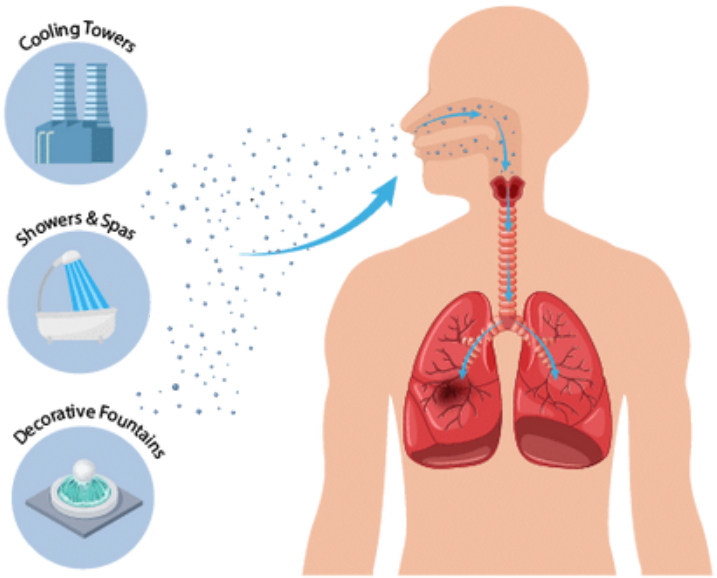
WHAT IS LEGIONNAIRES' DISEASE?

Legionnaires' disease is a severe kind of pneumonia you get by breathing in water droplets containing *Legionella* bacteria. Once exposed to the bacteria, it can bring on symptoms like cough, shortness of breath, high fever, muscle aches, and headaches. It's especially dangerous for older adults, smokers, or people with weak immune systems, and needs fast antibiotic treatment to prevent serious illness or even death.

WHAT CONDITIONS NEED TO BE MET TO CONTRACT LEGIONNAIRES' DISEASE?

To get Legionnaires' disease, you must inhale water droplets (aerosols) containing *Legionella* bacteria. This usually happens when:

- The bacteria are present in warm water (68°F–113°F)
- The water becomes aerosolized (e.g., from cooling towers, showers, or hot tubs)
- You breathe in the contaminated mist (exposure)
- You're at higher risk (age 50+, smoker, chronic illness, or weakened immune system)



SHORT HISTORY OF LEGIONNAIRES' DISEASE

Legionnaires' disease was first identified in 1976 after a mysterious outbreak of pneumonia-like illness occurred at an American Legion convention in Philadelphia. The event sickened over 200 people and resulted in 34 deaths.

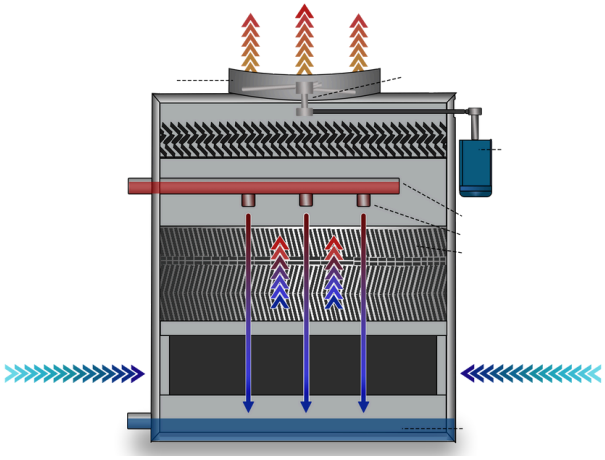
After an extensive investigation, scientists discovered the cause was a previously unknown bacterium, later named ***Legionella pneumophila.*** The bacteria had spread through the hotel's air conditioning cooling tower, contaminating the air with infected water droplets.

Since then, Legionnaires' disease has been recognized as a serious waterborne illness, particularly in man-made water systems like cooling towers, plumbing systems, and hot tubs. It led to major advances in water treatment regulations and building maintenance standards to prevent similar outbreaks.

HOW TO TEST FOR *LEGIONELLA* BACTERIA IN WATER SYSTEMS?

Testing for *Legionella* helps ensure water systems are safe by detecting the presence of this harmful bacteria. Water samples are taken from key areas like pipes, hot water tanks, or faucets and sent to a lab. There, technicians either grow the bacteria in a culture plate test or use a faster method called PCR, which detects DNA fragments. Regular testing is especially important in warm, stagnant water systems, such as hot water tanks and cooling towers, to identify problems early and prevent outbreaks.

HOW TO PREVENT *LEGIONELLA* GROWTH IN COOLING TOWERS?



Cooling towers are devices that cool buildings or factories with water, but they can become *Legionella* growth hotspots if not maintained properly. To prevent growth, regularly drain, scrub, and disinfect them to remove dirt and slime where these bacteria thrive. Adding biocides, special chemicals designed to kill bacteria, to the water and keeping it flowing, which prevents stagnation, also helps to stop the bacteria from getting a foothold in the system.

HOW TO TREAT LEGIONELLA GROWTH CONTAMINATION IN WATER SYSTEMS?

If *Legionella* growth is found in a water system, act quickly by heating the water to 140°F or higher to kill the bacteria, or add disinfectants like chlorine. Other strategies can involve an enhanced flushing program. This ensures the age of the water is lowered and pulls in fresh disinfectant from the city water provider. After treatment, test the water again to confirm it's safe, and consider cleaning or replacing parts like pipes or filters if they're harboring bacteria. Speed is key to fixing the problem.

HOW TO REDUCE THE RISK OF *LEGIONELLA* IN SHOWERHEADS AND FAUCETS?

Showerheads and faucets can spread *Legionella* bacteria if water sits stagnant in them too long. Clean them regularly with disinfectant to remove bacteria and buildup, and run the water for a couple of minutes before use to flush out the pipes. In infrequently used areas, like guest bathrooms, run the water every few days to keep it fresh.

HOW TO PERFORM A *LEGIONELLA* RISK ASSESSMENT?

To perform a *Legionella* risk assessment, start by identifying all water systems that could support bacterial growth, such as cooling towers, plumbing systems, or decorative fountains. Evaluate risk factors like water temperature, stagnation, and the presence of aerosol-generating equipment, as well as the vulnerability of building occupants. Assess current maintenance practices, monitoring routines, and chemical treatment systems. The *CDC's LEAF (Legionella Environmental Assessment Form)* provides a structured approach to identifying and controlling these risks, helping facilities develop effective water management plans and prevent Legionnaires' disease.

HOW TO DEVELOP A LEGIONELLA MANAGEMENT PLAN FOR A BUILDING?

A *Legionella* water management plan is a straightforward guide to reduce the risk of bacterial growth in the building's water system. Include regular testing, cleaning schedules for tanks and cooling towers, and steps to take if bacteria are found. Assign clear roles to team members and check-up times so everyone knows how to keep the water safe and clean.

HOW TO IDENTIFY POTENTIAL *LEGIONELLA* GROWTH RISKS IN A WATER DISTRIBUTION SYSTEM?

To find *Legionella* risks in a building water distribution system, look for spots where water sits still (stagnant), like unused pipes or tanks, since stagnant water is a danger zone. Check that the water isn't too warm (68°F to 113°F is ideal for bacteria) and ensure the system is free of leaks or dirty filters where bacteria can grow.

HOW TO CONDUCT A LEGIONELLA BACTERIA SAMPLING PROGRAM?

1. Start with a writen sampling plan that outlines where, how often, and how samples will be collected.
2. Select representative points in the system inlcuding incoming water (baseline), dead legs or low-use outlets, hot water return loops, and biofilm-prone areas.
3. Collect water samples using sterile containers and follow best practices.
4. Send Samples to a Certifed Lab.
5. Compare results to recommended action levels. For example, any detection of *Legionella* in healthcare or high-risk settings typically requires immediate action. Action levels vary, but a count above 1 CFU/mL (potable water); 100 CFU/mL (makeup water)
6. (colony-forming units) often triggers corrective measures.
7. If *Legionella* is detected, disinfect affected systems, invesigate the source, retest after remediation and review and revise your treatment program as needed.
8. Maintain a log of sampling locations and schedules, labratory reports, actions taken and follow-up results.

HOW TO HANDLE A *LEGIONELLA* OUTBREAK OR CASE?

Handling a *Legionella* outbreak requires fast action and coordination with health authorities. First, confirm the case through proper medical testing and report it to public health officials. We recommend reaching out to a reputable *Legionella* consultant for support. Then, identify and shut down potential sources like cooling towers, showers, or hot tubs. Collect water samples and test for *Legionella*.

If contamination is found, immediately disinfect the affected systems, following guidelines like ASHRAE Standard 188. Communicate clearly with anyone affected, providing updates and health information.

Before restarting any systems, confirm they're safe through follow-up testing and get approval from authorities. Finally, review and strengthen your water management plan to prevent future issues—especially through regular testing and proper maintenance of your cooling tower chemical treatment system.

PUT YOUR *LEGIONELLA* PLAN INTO ACTION

Now that you understand the risks and best practices, take the next step toward prevention. Don't leave your water systems to chance, get expert support to implement a compliant, effective *Legionella* control program.

LOOKING FOR MORE *LEGIONELLA* GUIDANCE?

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