

10

WAYS TO PREVENT Building-Associated Legionnaires' Disease

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Did you know? *Legionella* was the most commonly identified infectious organism in outbreaks associated with drinking water. (Craun 2010)

Managing risks to the safety and health of people who inhabit or visit your building is one of the most important aspects of your job. Taking a proactive preventative approach is the key to minimizing the risk of infection from *Legionella* in your building water system. Here are 10 ways that you can save time and money, prevent litigation and illness, and maybe even save a life.

1 Separate myth from fact.
There are several commonly held myths about *Legionella*.

Myth: Look first to the cooling tower.

Some people still mistakenly think air-conditioning systems and cooling towers are responsible for most cases of Legionnaires' disease. Domestic (potable water) plumbing systems are a notable source as well. Such systems have been commonly linked to occurrences and transmissions of Legionnaires' disease in large buildings and/or complexes. Current data suggests that cooling towers and evaporative condensers, while still potential sources for Legionnaires' disease, may be overemphasized as a means of *Legionella* transmission.

Myth: Legionella is everywhere (ubiquitous).

Legionella is not everywhere. Many say there is no point in testing for *Legionella* because you will always find it. A range of studies dispute this information. In fact, *Legionella* colonizes the water in 20 to 70 percent of buildings. So, wouldn't you want to know if your facility was one of the buildings where *Legionella* was not found?

Myth: Maintenance is the key to prevention.

A widespread misconception is that good engineering practices and preventive maintenance of the water distribution system will prevent *Legionella* colonization (Stout, ASHRAE). However, hospitals and commercial buildings that followed a preventive maintenance program that included cleaning or flushing hot

water storage tanks on a weekly to annual basis were as likely to be contaminated with *Legionella* as those that did not (Stout 07).

Myth: Water stagnation causes Legionella to multiply.

Stagnation is widely believed to predispose water systems to colonization by *Legionella*. A study, using a model plumbing system to determine the effect of flow regimes on the presence of *Legionella* within microbial biofilms (Liu 2006 JAM), failed to show that stagnation promoted growth of *Legionella*. Furthermore, in a small controlled study, removal of dead leg pipes did not decrease *Legionella* colonization (Liu 06).

2 Review Legionella guidelines and standards.

Legionella prevention guidelines for safeguarding potable water systems and utility water systems in your building are available for facility engineers, water treatment, and infection control professionals. Familiarizing yourself with them and knowing how they apply to your facility could save your institution from an outbreak of Legionnaires' disease. Guidelines are available online from the CDC, EPA, OSHA, Allegheny County Health Department, Veterans Healthcare Administration, Association of Water Technologies, the states of Maryland, Texas and New York, the Joint Commission, CDC, the Cooling Technology Institute (Fields), and ASHRAE guideline 12-2000 in 2012. With so much information available, you can be sure of one thing: doing nothing is not an option.

3 Seek advice from experts.

It may be surprising to learn there is no national standard or consensus among health and professional organizations for preventing Legionnaires' disease. Deciding what guidelines to follow can therefore be confusing. What may surprise you even more is that for recommendations found in many guidelines there's little or no scientific evidence to back them (Stout-ASHRAE). Not only that, some practices can burden building engineers with labor-in-

tensive tasks that show little benefit. Seeking competent advice from *Legionella* experts and using both an accredited and CDC-elite certified lab for *Legionella* testing could save you time and money.

4 Be prepared.

A surprise inspection by The Joint Commission (formerly JCAHO) can severely interrupt your planned activities for the day. Even worse, a positive *Legionella* test result, or several positive results, can arrive on your desk at any time causing you to reach for the antacid bottle. What we all dread most is the notification that a person has contracted Legionnaires' disease, or, even worse, learning it was fatal. A knock on your door with legal action papers may soon follow such an incident. Having an up-to-date risk management and communication plan that addresses all of these scenarios can quickly resolve issues before they become *problems*.



Potable water systems are a common source of *Legionella* transmission.

5 Create an interdisciplinary response team.

Responding to *Legionella* and other infectious water-borne pathogens found in your water system requires a team effort. This team should include someone in your organization with knowledge of safety and health issues, your water treatment company representative, a laboratory with *Legionella* expertise, and a *Legionella* risk management professional. The team can provide a proactive plan for prevention as well as develop an emergency action plan to follow if needed. In fact, ASHRAE requires this in its new *Legionella* standard 188.

6 Follow industry best practices.

It pays to follow industry best practices, so take the time to review those standards provided by your peers. All of the following resources are available online (you can find them in one place at www.specialpathogenslab.com/Legionella-Guidelines-Table.htm). Download them, print them, and use them!

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE): Minimizing the Risk of Legionellosis Associated with Building Water (www.ashrae.org)

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- Association of Water Technologies (AWT) *Legionella 2003, An Update and Statement by the Association of Water Technologies* (www.awt.org)
- Cooling Technology Institute (CTI) *Legionellosis Guideline: Best Practices for Control of Legionella* (www.cti.org/cgi-bin/download.pl)
- Occupational Safety and Health Administration of the Department of Labor (OSHA): Technical Manual- Section III, Chapter 7 and Appendix III. (www.osha.gov)

3 COMMON DISINFECTION METHODS

- High temperature flush
- Hyper halogenation (with chlorine or chlorine/bromine compounds)
- Copper/silver ionization

9 Verify by testing. Testing your water system is the *only* way to confirm the presence of *Legionella*. Studies show there are no surrogate markers—temperature, chlorine, disinfectant residual—that can predict the presence or absence of *Legionella*.

For example, total bacterial counts (HPC) aren't predictive of the presence or absence of *Legionella*, whether tested by culture or ATP. The bottom line is: no matter what you do, if you don't test, you don't know. That is why leading experts in the detection and remediation of *Legionella* have strongly recommended culturing water to assess risk and to verify the efficacy of disinfection (see www.legionella.org).

7 Know the sources for *Legionella* infections.

Legionella may be found in the potable and utility water systems in your building. This includes water used for drinking, cooking, washing, bathing, and also water that flows from plumbing fixtures, cooling towers, boilers, and other HVAC related equipment.



Cooling towers may be overemphasized as a means of *Legionella* transmission

If water or aerosols contaminated with *Legionella* are ingested or inhaled, the bacteria can cause serious illness. *Legionella* can also be transmitted through respiratory devices. People “at risk” for Legionnaires’ disease are smokers, elderly, and immune system suppressed individuals (bone marrow or organ transplant patients and persons on high doses of steroids or other immunosuppressive agents).

8 Chose the best disinfection method.

Choosing a disinfection method that works best for you requires planning and analysis based on efficacy, cost, installation, and maintenance (Lin 2010). Before selecting the best approach, organize a task force consisting of administration, risk management, infection control practitioners, and engineers. No disinfection technique can be successful without a conscientious monitoring program and a committed staff. Facility engineers are the first-line hands-on staff who operate, control, and maintain disinfection equipment. If a disinfection system is installed, *Legionella* site positivity and disinfectant concentrations need to be routinely monitored for the life of the system.

10 Don't panic when water tests positive for *Legionella*!

If *Legionella* is found in your water system, the chance that illness will occur mostly depends on *who* is in the building. Buildings at high risk for *Legionella* include healthcare facilities, such as hospitals and nursing homes. An increasing number of cases have been reported from assisted-living and long-term care facilities.

If the water system in high-risk buildings is highly colonized with *Legionella*, you need to treat your building to control *Legionella*. However, low-risk buildings, such as commercial office buildings, may not require aggressive measures (continuous disinfection) when *Legionella* is found. **FEI**

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Footnotes/Sources

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