



FACT SHEET

Legionella

[December 2015]

GENERAL OVERVIEW

Legionella are small bacteria found almost everywhere in the environment. Researchers are continuously discovering new subtypes, and as of 2015 there are at least 50 species and 70 serogroups; 25 *Legionella* species are associated with human disease and *Legionella pneumophila* is most often the cause of human infection, known as Pontiac Fever. *Legionella* was named after it was discovered to be the cause of a severe pneumonia outbreak that occurred in Philadelphia in 1976 during a convention of the American Legion.

SOURCES

Legionella are ubiquitous in the environment and exposure is through aerosolization or inhalation, although the bacteria have also been found in soil. Exposure has been associated with hot water systems, air conditioning cooling towers, evaporative condensers, mist machines, decorative fountains, respiratory therapy devices, humidifiers, hot tubs, and whirlpool spas. *Legionella* may be isolated from hot and cold water taps and from creeks, ponds, and surrounding soil. Potting soil has also been associated with cases of Legionellosis, though the mechanism is unknown. *Legionella* does not transmit from person-to-person.

MONITORING AND TREATMENT

The Environmental Protection Agency (EPA) has an established Maximum Contaminant Level Goal (MCLG) of zero for the presence of *Legionella* in drinking water. The SFPUC meets this non-enforceable guideline through compliance with EPA's Surface Water Treatment Rule, which requires water systems to filter and/or disinfect water so that microorganisms are removed and/or inactivated. The SFPUC uses chloramination for residual disinfection, and this treatment is superior to chlorine for *Legionella* control.

Even with these processes, however, small amounts of *Legionella* can survive, and given the proper conditions, can colonize ends of plumbing systems. Consequently, a key element for controlling *Legionella* is the design and maintenance of cooling towers and plumbing systems to limit *Legionella* growth and aerosolization. Increasing the temperature of hot water systems and ensuring proper biocide treatment of cooling towers may limit exposure to *Legionella*.

Building and hospital standard operational procedures are used to prevent growth and transmission of these bacteria. Effective control measures include disinfection, copper-silver ionization, maintenance of cooling towers, maintaining potable water in hot water storage tanks at temperatures above 60°C (140°F) and ensuring circulating water is higher than 51°C

(124°F). Maintaining such high water temperatures can introduce a scalding risk, so thermostatic mixers may be used to minimize this risk.

HEALTH CONSIDERATIONS

For many people exposure to *Legionella* will have no effect; however, for others it may cause mild symptoms, such as headache and fever. A small percentage of people exposed will become seriously ill. The elderly, smokers and persons with chronic lung disease are at higher risk for infection. Also at increased risk are immunocompromised individuals such as those with cancer, diabetes, or AIDS. Symptoms of the disease will usually appear 2 to 10 days after exposure.

REFERENCES

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EPA: "Legionella: Drinking Water Fact Sheet" (2000)
http://water.epa.gov/action/advisories/drinking/upload/2009_02_03_criteria_humanhealth_microbial_legionellafs.pdf

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<http://water.epa.gov/lawsregs/rulesregs/sdwa/swtr/>

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<http://sfwater.org/cfapps/wholesale/uploadedFiles/2013%20PHG%20Report%20Full%20v6-20-13.pdf>

SFPUC: "San Francisco Water Quality Protection Plan" (2008)
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AWWA: “Legionella Reduction after Conversion to Monochloramine for Residual Disinfection” (2008)

<http://www.awwa.org/publications/journal-awwa/abstract/articleid/15852.aspx>

ANSI/ASHRAE Standard 188-2015 “Legionellosis: Risk Management for Building Water Systems”

<https://www.ashrae.org/resources--publications/bookstore/ansi-ashrae-standard-188-2015-legionellosis-risk-management-for-building-water-systems>

CONTACT US

If you still have concerns about the quality of water and would like to report emergency water quality issues, please call our 24-hour hotline at 3-1-1 (within SF only) or 415-701-2311. You can also visit <http://www.sf311.org/>.