



Background

Exposure to Legionella bacteria, specifically *Legionella pneumophila*, may lead to developing certain illnesses including Legionnaires' disease or Pontiac fever. The bacteria lives in freshwater-based environments, including potable water in buildings, and can survive (under the right conditions) for many months.

Symptoms of Legionnaires' Disease and Pontiac Fever

Legionnaires' disease is a severe form of pneumonia or lung inflammation usually caused by the Legionella bacterium. Most people get Legionnaires' disease from inhaling the bacteria. The most susceptible people are the elderly, smokers, and those with weakened immune systems. The disease cannot be transmitted from one person to another. The most common symptoms include:

- fever
- chills
- dry cough
- muscle pain
- headache
- tiredness
- loss of appetite
- loss of coordination
- chest pain
- diarrhea, and/or
- vomiting

Complete recovery is possible; however, Legionnaires' disease may be fatal in some cases.

Pontiac Fever is a less severe form of the disease, and does not include pneumonia. Common symptoms include fever and muscle aches.

For more information on Legionella bacteria and its associated infections, please visit [Public Health Agency of Canada](#) and the [Canadian Centre for Occupational Health and Safety](#).

How Legionella is transmitted from HVAC systems

Many workplaces under federal jurisdiction use water-cooled industrial and commercial air conditioners. The water contained in these units and in the cooling towers can contain Legionella bacteria. This is an environment where these bacteria can grow under certain conditions. Legionella bacteria grows best at warm temperatures. It grows vigorously between 25°C and 45°C; however, prolonged exposure to temperatures above 60°C will kill the bacteria. The bacteria is primarily transmitted to people via the inhalation of water droplets or aerosolized fine mists

Factors that can lead to a Legionella exposure from a HVAC system cooling tower

- Not following the manufacturer's instructions for use and maintenance of cooling towers and air conditioners

- Inadequate workplace procedures for using, maintaining, inspecting, and servicing the HVAC system
- Inadequate cleaning and disinfection procedures
- Improper training and personal protective equipment for the safe maintenance, cleaning, and disinfection procedures for HVAC systems
- Improper placement of HVAC systems (e.g., fresh air intakes constructed near cooling towers)

Other areas of concern

Legionella bacteria may also be present in the following areas of concern:

- stagnant potable water pipes
- decorative water displays (fountains, waterfalls, ponds, etc.)
- faucets
- humidifiers

Eliminating and controlling the hazard

Proper use, care, maintenance, cleaning, and disinfection of the potential areas of concern, especially during spring and summer, is the most effective way to prevent excessive Legionella growth in the workplace.

This includes analytical testing by a competent person on a regular basis of the HVAC system cooling towers and other areas of concern, and the use of appropriate cleaners and disinfectants. To avoid potential airborne exposure while performing activities that may aerosolize the contaminated water, including purging, maintenance, cleaning, disinfection, or water sampling processes, it is recommended that the person(s) wear appropriate respiratory protection as per the *CSA-Z94.4-18 Selection, use, and care of respirators*.

Regulatory requirements for employers

The *Canada Occupational Health and Safety Regulations* (COHSR), Part II, Division III entitled “HVAC Systems” contains requirements in respect of HVAC systems, such as:

- standards
- records
- operation
- inspection
- cleaning
- testing
- maintenance, and
- investigations

Additional Information

- instructions for the operation, inspection, testing, cleaning, and maintenance of HVAC systems must be written and reviewed by a qualified person who shall take into account CSA Guideline Z204-94, entitled *Guideline for Managing Air Quality in Office Buildings*, dated June 1994
 - the employer must then appoint a qualified person to put the instructions into action and to complete a written report about each inspection, cleaning, testing, and maintenance event
 - employers must have a qualified person develop an investigation procedure for events where a worker’s health or safety may be harmed or at risk of exposure by the air quality, such as an exposure to Legionella
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- the qualified person shall take into account the [Health Canada publication 93-EHD-166, Indoor Air Quality in Office Buildings: A Technical Guide when writing an investigation procedure](#). It is also recommended that the qualified person consult the following publications:
 - American Society of Heating, Refrigeration and Air-conditioning Engineer (ASHRAE), *Legionellosis: Risk Management for Building Water Systems*. BSR/ASHRAE Standard 188-2018
 - American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), *Minimizing the Risk of Legionellosis Associated with Building Water Systems*. ASHRAE Guideline 12-2000
 - American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Atlanta, GA (404-636- 8400). Legionellosis Position Paper, 1998
 - Cooling Technology Institute, *Legionellosis Guideline: Best Practices for Control of Legionella* (CTI Guidelines WTP-148), July 2008
 - Flanders, W.D., Morris, G.K. and Shelton, B.G. (1994). Legionnaires' Disease Outbreaks and Cooling Towers with Amplified Legionella Concentrations. *Current Microbiology* 28, 359-363
 - Millar, J.D., Morris, G.K. and Shelton, B.G. (1997) Legionnaires' Disease: Seeking Effective Prevention. *ASHRAE Journal*, 22-29
 - OSHA Technical Manual, Section III, Chapter 7: Legionnaires' Disease. Occupational Safety and Health Administration, Department of Labor, Washington, D.C.
 - *Legionella 2019: A Position Statement and Guidance Document* published by the Association of Water Technologies (AWT)

Contact us

For more information, please contact the [ESDC Labour Program](#) office. The Labour Program website provides information on occupational health and safety topics such as:

- [occupational health and safety in federally regulated workplaces](#)
- [an employee's right to refuse dangerous work](#)
- [and workplace health and safety committees and representatives](#)

Related links

- [Legionnaires' disease - Canadian Centre for Occupational Health and Safety](#)
 - [Water Topics | Environmental Topics | US EPA](#)
 - [Legionella Compliance Software - Water Management Plans - Analytics](#)
 - [Legionellosis \(Legionnaires' Disease and Pontiac Fever\) - Control Prevention | Occupational Safety and Health Administration](#)
 - [Controlling Legionella in Cooling Towers | CDC](#)
 - [American Society of Heating, Refrigeration and Air-Conditioning Engineers \(ASHRAE\) Guidance on Reducing the Risk of Legionella](#)
 - [Controlling Growth of Legionella in Water Systems](#)
 - [What is New for the Latest on Legionnaire's Disease](#)
 - [Code of practice for the control of Legionella bacteria in cooling towers](#)
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