

LEGIONELLA



What Organism causes Legionnaires disease?



Legionnaires' disease, also called Legionellosis is a lung infection, a form of pneumonia which can be fatal, caused by the *legionella* bacterium. The name Legionnaires' disease emerged in 1976; in July there was an outbreak of pneumonia among delegates at a convention of the American Legion in Philadelphia. In January of the following year, the causative agent was identified as a previously unknown bacterium, which was subsequently named *Legionella*.

Where do Legionella bacteria come from?

Legionella bacteria commonly exist in rivers and lakes, and some other water sources, generally in low numbers. Occasionally, they may get into artificial water supply systems, as may be the case with evaporative condensers associated with air conditioning and industrial cooling or anywhere where artificial water is being supplied or used.

Since this first recorded outbreak, experience has shown that cooling towers, evaporative condensers and hot and cold water systems in a wide variety of workplaces present a risk of exposure to Legionella bacteria. Other systems have also been identified that can present a risk of exposure to these bacteria (including ultrasonic humidifiers and foggers, water misting systems, spray humidifiers, air washers, wet scrubbers, water softeners, emergency showers and eye wash sprays, sprinkler and hose reel systems, lathe and machine tool coolant systems, spa baths or saunas, horticulture misting systems, dental equipment, car-bus washes, indoor fountains and water features).

What are the favorable conditions for the bacteria to grow in?

Within the natural aquatic environment, the concentrations of *L pneumophila* are relatively low. Once the water is transferred into man-made water reservoirs, the Legionella organisms proliferate because of favorable conditions. *Legionella* bacteria will multiply where one or more of the following conditions exist in a water system, namely:

- Warmer temperatures – this organism thrives between the temperatures of 20°C to 50°C. Cold-water systems above 20°C and hot water systems below 50°C are thus especially at risk.
- Stagnation – when there are redundant water pipes in a building or lengths of pipe with blind ends or where taps are not used frequently – all this can produce stagnant water which allows Legionella to thrive and multiply.
- Sediment – this usually occurs in water tanks or boiler tanks. Over time there is a buildup of sediment which favors the survival and multiplication of Legionella.

How do people contract Legionella?

You cannot catch Legionnaires 'disease from other infected people. *Legionella* is transmitted to humans via inhalation of colonized aerosols or droplets, which are produced by air conditioners, cooling towers and condensers, water fountains, shower heads, faucets, whirlpools, ice machines, spas, nebulizers, and humidifiers. Legionnaire's disease strikes vulnerable people



(immuno-compromised), especially the elderly and those with other underlying medical conditions, the hardest.



What are the signs and symptoms of Legionnaires 'disease'?

Legionnaires' disease may be hard to diagnose at first because its signs and symptoms may be very similar to other forms of pneumonia. Signs and symptoms usually appear between 3 to 6 days after initial infection; more rarely it may be just 2 days or up to 10 days. Signs and symptoms of Legionnaires' disease typically include:

- a high fever
- chills
- a cough
- muscle aches
- headaches

In some cases there may be an initial stage during which the patient experiences just muscle aches and a mild headache, before the other signs start to appear a couple of days later. When more severe symptoms appear, the fever will be high. The muscle pains often get worse, and the patient starts to have chills. If the bacteria get into the patient's lungs, which often occurs, there may be a persistent cough, shortness of breath and chest pains. The cough may be dry at first, but can eventually have a lot of mucus and even blood as the infection develops.

Who is at risk of Legionella infection?

- Immuno-compromised individuals and those with underlying diseases,
- Transplant patients are at risk for infection
- Cigarette smoking, chronic lung disease, and those undergoing immune-suppressive treatment

What treatment options are available?

Air condition systems need to be constructed, run and maintained according to the guidelines set out in the new standards.

- Water systems should be maintained at 20°C for cold water and 50°C for hot water.
- Stagnant systems should be flushed regularly.
- Water tanks and boilers should be cleaned to remove all sediment once a year.
- Chemical biocides can be used to kill Legionella in potable and air conditioning water systems.
- Systems should be treated for scale and corrosion by using inhibitors in order to reduce the likelihood of scale and deposits that will favor the growth of organisms.

Are there regulations to prevent Legionnaires outbreak in South Africa?

Legionella falls under occupational Health and Safety Act, No 85:1993- Regulation for biological agents. While *Legionella* is legislated in SA, the legislation is poorly policed and not legally binding. There are two publications of new national standards aimed at lessening exposure to *Legionella* bacteria. SANS 893-1 provides guidelines for the risk management of *Legionella* bacteria in any undertaking, while SANS 893-2 focuses on requirements for designing and managing hot and cold water systems that could create and transmit water droplets (and thus *Legionella* bacteria).

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