

Legionnaires disease



Introduction

Legionnaires' disease is a lung infection (a type of pneumonia) that can be either mild or severe enough to cause death. In its mild form, it is called 'Pontiac fever'. The disease got its name in 1976 when an outbreak of pneumonia occurred in people at an American Legion Convention.

Legionnaires' disease is caused by bacteria called Legionella. These bacteria are usually found in water and soils, depending on the species

In New Zealand:

Legionella pneumophila is the most common cause - and is connected with hot water systems and cooling towers.

Legionella long beachae is the next most common and is found in soils, compost, and potting mixes.



Legionella can grow on wet surfaces of the cooling units that are part of some building air-conditioning systems and other industrial cooling equipment. It can also grow in pools of water, and its growth is more rapid the higher the temperature of the water. It will not grow in water over 60 degrees C.

In certain circumstances legionella can become airborne and be ejected out of a cooling tower or scrubber in water droplets. The airborne bacteria can be dispersed by the wind to affect members of the public outside a building, or be captured by poorly positioned air intakes of an air-conditioning system.

Some people are more at risk than others. Adults over the age of 50, smokers, people prone to lung disease and other people with low immunity are particularly vulnerable. Legionnaires' disease is treated with antibiotics.

Legionnaires' disease is not contagious and outbreaks are localised. In New Zealand, Legionnaires' disease is a notifiable disease under the Health Act 1956. This means that a doctor is required to notify the medical officer of health at the

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Public Health Service if he/ she suspects a patient suffers from, or is diagnosed with, Legionnaires' disease.

The actions needed to prevent the growth of the bacteria are relatively simple.

Comprehensive Codes of Practice (e.g. the New Zealand Guidelines for the Control of Legionellosis and the more recent New South Wales Code of Practice for the Control of Legionnaires' Disease and Standards describe the design, operation and maintenance and monitoring of air-conditioning systems.

Preventing Legionnaires' disease is more likely if you:

1. Choose a system that minimises the opportunity for the bacteria to grow:

- design or select plant elements that are easy to clean and minimise bacterial growth
- select processes that allow minimal opportunities for bacterial growth (such as using a hot water system with mixing valves instead of a tepid water storage system)
- design components to avoid sludge build up (legionella grow better in sludge)
- avoid dead-legs in pipe work (so the bacteria cannot grow there)
- use drift eliminators (these are mechanical devices that prevent water droplets leaving a cooling tower)
- provide easy access for maintenance and cleaning
- replace inefficient equipment
- use a continuously operating disinfection process to kill any bacteria (see 3 below)
- position air intakes safely
- use an air-cooled system rather than a cooling tower (absence of water means Legionella can't grow)
- use a closed-circuit system instead of an open circuit (this eliminates potential growth surfaces).



2. Keep water handling systems clean.

3. Treat the water with chemicals. Specialist advice is needed on:

- the dosing equipment —its selection and operation
- bleed-off techniques (to avoid the accumulation of chemical residues)
- the choice of biocides (effectiveness vs eco toxicity);
- water sampling and testing (regular quality control — in accordance with AS/NZS 3666.3: 2000 — Performance-based maintenance of cooling water systems) and
- routine cleaning.

4. Use the approach outlined in AS/NZS 3666.3 for monitoring water quality and interpreting the results. This standard also lists the actions that should be taken when these results indicate an increase of microbial growth in the water.

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Practical actions for building and plant owners, operators & employers

These observations mean that there are some clear responsibilities for:

- owners and operators of buildings with mechanical ventilation systems
- operators of cooling plant or equipment
- some employers.

General responsibilities

All groups

1. Ask for a condition report or specification on the safety and health of the air-conditioning system or cooling equipment.

2. Check the maintenance programme for the system/equipment.

3. Check water quality periodically. The final check for safety is to test for the presence of microbial growth in cooling water. This means that:

- Building owners should ensure they get monthly reports on water quality and that they are able to interpret or have interpreted the results (see AS/NZS 3666.3 and the New Zealand Building Code). This will allow employers to demonstrate compliance to local authorities.
- Employers should satisfy themselves that the air conditioning system remains safe — perhaps by seeking a copy of the monthly water quality report or requiring the building owner to report by exception.
- Operators of cooling plant in industry should satisfy themselves that the cooling equipment remains safe. Since there are many similarities between air-conditioning units and cooling towers, monthly sampling and reporting of water quality is recommended. This type of plant could include cooling units in the following and settings:

- ✓ Food processing + storage
- ✓ Plastic moulding machinery
- ✓ Plants that operate emission control scrubbers to prevent the release of environmental air contaminants
- ✓ Cooling units for computer rooms or telephone exchanges
- ✓ Super market misting units.

