

# Legionella

## Background

Legionnaires' disease is a potentially fatal form of pneumonia caused by the bacterium legionella pneumophila and sub-species of legionella bacteria. Low numbers of the bacterium are often found naturally in environmental water sources such as rivers, lakes and reservoirs. Legionella bacteria are commonly encountered in environmental sources and may eventually colonise manufactured water systems and be found in cooling tower systems, hot and cold water systems and other plant which uses or stores water. If conditions are favourable the bacterium may grow creating conditions in which the risk from legionnaires' disease is increased.

The growth of legionella can be affected by:

### Water temperature:

The bacteria prefers temperatures of between 20°C and 45°C with an optimum favourable temperature of 37°C (body temperature). The organisms do not appear to multiply below 20°C and will not survive above 60°C. They can however remain dormant in cool water.

### Nutrients

The bacteria also need nutrients to multiply. The presence of sediment, sludge scale and organic material can act as a source of nutrient and may act as protection from temperatures and concentrations of biocides.

## Legionnaires' disease

The first identified outbreak of Legionnaires' disease occurred in the United States in 1976 where 221 people were infected resulting in 34 deaths. The symptoms of the disease include high fever, chills, headache and muscle pain. A dry cough often develops and most patients suffer breathing difficulties. Patients may also suffer from symptoms of diarrhoea or vomiting and may become confused or delirious. In around 12% of cases the disease proves fatal.

Anyone can contract Legionnaires' disease however certain groups of people are known to be more at risk. This includes those already suffering from illnesses, immunosuppressed patients, those over 45 years of age, smokers, alcoholics and diabetics.

The disease is normally contracted by inhaling legionella bacteria usually in water droplets (aerosols) which are small enough to penetrate deeply into the lungs.

## Legislation

- The Health and Safety at Work Act 1974 and The Control of Substances Hazardous to Health Regulations (COSHH) contain requirements concerning the risk of exposure to legionella bacteria.
- ACOP L8: The Control of Legionella Bacteria in Water Systems provides guidance on sections 2,3,4 and 6 of the HSWA and regulations 6,7,8,9 and 12 of COSHH and also contains guidance on compliance with the Management of Health and Safety at Work Regulations 1999 (MHSWR).
- ACOP L8 applies to 'the control of legionella bacteria in any undertaking involving a work activity and to premises controlled in connection with a trade, business or any other undertaking where water is stored and where there is a means of creating and transmitting water droplets which may be inhaled thereby causing a reasonably foreseeable risk of exposure to legionella bacteria.'

Sources of reasonably foreseeable risk of exposure to legionella bacteria include:

- Cooling towers, evaporative condensers and other cooling systems.
- Hot and cold water systems.
- Other risk systems including plant and water systems which may release a spray of aerosols during operation or during maintenance.

Those who are in control of premises containing cooling towers or evaporative condensers have a duty under the Notification of Cooling Towers and Evaporative Condensers Regulations 1992 to notify the local authority in writing with details of 'notifiable' devices.

Technical guidance has been removed from the Approved Code of Practice (ACoP) and is now contained in a separate document; HSG274. HSG274 has been divided into three parts:

**Part 1:** Evaporative cooling systems.

**Part 2:** Hot and cold water systems.

**Part 3:** Other risk systems.

Details regarding carrying out a legionella risk assessment are no longer classified as guidance, but have been upgraded to Approved Code of Practice status. This places a greater emphasis on how you approach the task of risk assessment.

## What do I need to do to comply?

Legionnaires' disease can be a serious issue and in order to comply with their legal duties, employers and those with responsibilities for the control of the premises must appoint a person or persons to be responsible for the sources of risk. Their duty involves:

- Identification and assessment of the sources of risk. A full and detailed risk assessment must be undertaken of all water related plant to check whether conditions are present which will encourage bacteria to multiply. This includes:
  - Mains cold water systems
  - Cold water storage systems
  - Hot water systems including storage cylinders
  - Supply pipework and pumping systems
  - Shower units
  - Cooling towers/evaporative condensers
  - Air conditioning systems including air handling units
  - Ornamental water fountains and irrigation systems
  - Other risk systems including spa baths, water softeners, foggers/water misting systems, spray humidifiers, water coolant systems and recirculating vehicle washers
- Preparation of a scheme for preventing or controlling any identified risks.
- Implementing, managing and regularly monitoring any precautions required.
- Keeping records and logbooks of any precautionary measures taken to ensure that the appointed contractor is carrying out all the relevant tests and inspections as identified in the water risk assessment.

## Identification and assessment of sources of risk

Prior to the implementation of a system to manage the health and safety of the water system it is necessary to carry out a risk assessment to identify and assess the risk of exposure to legionella bacteria from work activities and water systems on the premises.

The assessment should include the identification and evaluation of potential sources of risk and the means by which exposure to legionella bacteria is to be prevented. If prevention is not reasonably practicable then the particular means by which the risk of exposure to legionella bacteria is to be controlled should be evaluated. Complex sites will require a site survey of all associated plant, pumps, strainers and other relevant equipment. Up to date schematic diagrams will also be required.

Factors which should be considered when conducting the assessment include:

- The sources of system supply water eg. mains supply or not.
- Possible sources of contamination of the water supply within the premises before it reaches the cold water storage cistern, calorifier, cooling tower or any other system using water that may present a risk of exposure to legionella bacteria.
- Normal plant operating conditions.
- Unusual but reasonably foreseeable operating conditions eg. breakdowns.

The findings of the assessment should be recorded and reviewed whenever there is a reason to suspect that it is no longer valid such as when:

- There are changes to the water system or its use maybe due to changes in occupancy.
- Changes to the use of the building in which the water system is installed.
- The availability of new information regarding risks or control measures.
- Checks, including positive samples, indicate that the control measures are no longer effective.
- A case of Legionnaires' disease/legionellosis is associated with the system.

For medium or high risk systems or properties where there are a number of issues that require action, or where management controls are lacking, MetroSRM would recommend that a review is carried out annually.

## Preventing or controlling identified risks

Once the risk assessment is complete a written scheme needs to be developed and implemented which will prevent or control the likelihood of a risk occurring. The risk from exposure can normally be controlled by measures which do not allow the proliferation of legionella bacteria in the system and which reduce exposure to water droplets and aerosol. Appropriate precautions include:

- Controlling the release of water spray.
- Avoiding water temperatures and conditions which favour the growth of legionella bacteria and other micro-organisms.
- Avoidance of water stagnation.
- Avoiding materials which harbour and favour the growth of bacteria.
- Ensuring the cleanliness of the system and the water in it.
- The use of water treatment techniques which will either kill legionella or limit their ability to grow.

The scheme needs to include:

- A schematic plan.
- Details of the correct and safe operation of the system.
- Who is responsible for implementation.
- The precautions to be taken.
- Details of checks which need to be carried out to control the scheme and the frequency with which the checks should be carried out.
- Remedial action to be taken in the event that the scheme is not effective.

## Implementing, managing and monitoring

A responsible person needs to be appointed to ensure the scheme is implemented and managed successfully; this can be delegated to an outside contractor. Responsibilities should include:

- Checking the performance of the system and its component parts.
- Inspecting accessible parts of the system for damage and signs of contamination.
- Ongoing monitoring to ensure the treatment regime continues to control bacteria to the required standard. The frequency of monitoring will depend on the system but should be at least weekly.

## Record keeping

Records need to be kept providing details of:

- Persons responsible for conducting the risk assessment.
- Significant findings of the risk assessment.
- Written details of the scheme and how it is to be implemented and by whom.
- Details of any inspections, tests or checks carried out including dates and signatures.
- Records must be kept readily available for two years.
- Records of any inspections, tests or checks should be kept for at least five years.
- Training records for employees.

## Note on residential properties

Legionella bacteria can multiply in both hot and cold water systems including storage tanks in residential properties. This may then be disseminated in spray from taps and showers. Providers of residential accommodation have a responsibility to ensure that the risk to legionella in their properties is properly controlled. This may include local authorities, universities, housing associations, hostels, managing agents, hoteliers, landlords in the private sector etc. Even if the responsibility for maintaining the property has been passed on to a third party you cannot delegate this responsibility.

Even though the generally high throughput and low volume of water held in residential water systems reduces the risk of legionella bacteria you are still required to carry out a risk assessment to identify and assess any potential sources of risk and if required implement a system to prevent or control any identified risks.

As a provider of residential accommodation you need to be aware of the changes to the ACOP.

Persons responsible for management or control of Health Care Premises in addition to ACOP and HSG 274 also need to consult Health Technical Memoranda (HTMs) issued by the Department of Health (DoH):

Water systems for healthcare premises  
(HTM 04-01)

Decontamination in primary care dental practices  
(HTM 01-05)