

Legionnaires' disease

What is Legionnaires' disease?

Legionnaires' disease is a severe and potentially fatal form of pneumonia caused by Legionella bacteria. Between 10–15% of those infected may die, even with treatment. However, most people who come into contact with the bacteria and develop antibodies do not suffer any symptoms and remain well. It is treated with antibiotics. The bacterium Legionella pneumophila and related bacteria are common in natural water sources but usually in low numbers. They are also found in purpose built water systems and if conditions are favourable, the bacteria may grow increasing the risks of Legionnaires' disease.

People contract Legionnaires' disease by inhaling small droplets of water (aerosols) containing the bacteria.

Where can it be found:

- air conditioning systems with cooling systems with towers, evaporative condensers, or dry/wet cooling systems
- hot and cold water systems
- humidifiers, spa and whirlpool baths, showers, and ornamental fountains
- other and associated plant and systems
- conditions that will encourage bacteria to multiply - for example, a water temperature (all or in part of the system) between 20-45°C or a source of food such as sludge, scale, rust, algae, or fouling
- stored or re-circulated water
- the production or spread of water droplets - for example from showers or
- aerosols from cooling towers.

What are the symptoms for someone with Legionnaires' disease?

The initial symptoms are similar to flu:

- high temperature
- fever and chills
- coughing

- muscle pains
- headache

There may also be:

- diarrhoea
- signs of confusion.

If someone develops these symptoms and are worried that it might be Legionnaires' disease, they should be advised to visit the doctor. Diagnosis is not easy, and patients may be asked to take a blood or urine test. If the doctor diagnoses Legionnaires' disease and it is suspected that it occupation related, then this is reportable.

Checklist for individuals:

- anyone who has symptoms similar to Legionnaires' disease and are concerned, should see their GP
- if a doctor confirms Legionnaires' disease and that it may be work related, this should be immediately reported to the appropriate contact at work
- employers should take immediate action to identify the source, isolate the area, treat the contamination, report the incident.

Employers' duties

Law: there are a number of regulations that may apply.

COSHH – Control of Substances Hazardous to Health

All water systems require a legionella risk assessment and therefore all duty holders should undertake legionella awareness training

These regulations, along with the **Management of Health and Safety at Work Regulations** require employers to risk assess the hazards that their work may expose employees and others to

Legionella is **RIDDOR** reportable as an occupational disease

Notification of Cooling Towers and Evaporative Condensers Regulations, those who have control over premises with a cooling tower or evaporative condenser must notify the local authority in writing. They must also be advised if and when such devices are no longer in use. Notification forms are available from the local environmental health department. However, no notification is required if the water the

equipment contains is not exposed to the air and the water and electricity supply are not connected.

Employers (or persons in control of the workplace premises, such as landlords) are legally required to:

- identify and assess sources of risk from Legionnaires'
- prepare a course of action for preventing or controlling any risk
- implement, manage, and monitor the course of action for prevention/control
- appoint a responsible person
- keep records and check that what has been done is effective and
- if appropriate, notify the local authority that they have a cooling tower on site.

Assess the risk

Employers (responsible person) or someone else in control of premises (other duty holder) must risk assess for Legionnaires' and take appropriate measures to prevent or minimise the risk of exposure.

Whoever conducts the risk assessment will need to be competent, which will include an understanding of water systems and associated equipment, such as pumps, heat exchangers, and showers and determine if any of the water systems and equipment within the premises or on site are likely to create a risk? There are foreseeable risks from:

- air conditioning systems with cooling systems with towers, evaporative condensers or dry/wet
- cooling systems
- hot and cold water systems
- humidifiers, spa and whirlpool baths, showers, and ornamental fountains; plus
- other and associated plant and systems.

The factors that make these systems a risk are:

- conditions that will encourage bacteria to multiply - for example, a water temperature (all or in part
- of the system) between 20 - 45°C;
- a source of food for the bacteria such as sludge, scale, rust, algae, or fouling;
- stored or re-circulated water; and/or
- the production or spread of water droplets - for example from showers or aerosols from cooling towers.

Once a potential source of risk has been identified (see above), the assessment must then:

- cover management responsibilities, name the 'responsible person' (see below), and
- describe the water system
- identify measures to prevent exposure or if not reasonably practicable to do this, then to control (minimise) the risk
- include the details of monitoring or checks, inspections, and maintenance procedures and their results; and
- have a review date.

This should include:

- a description of the entire water system - an up-to-date plan/schematic diagram and an asset register
- who is responsible for carrying out the assessment and managing its implementation
- the safe and correct operation of the water system (including for start-up or restarts, and shutdown procedures)
- what control methods and other precautions will be used (including details of chemical or physical (such as temperature) treatment programmes, cleaning and disinfection procedures)
- what and how often checks will be carried out on the controls scheme
- checks of warning systems, maintenance requirements and frequencies, and operating cycles; and
- remedial action in the event of the scheme not being effective and emergency procedures.

The employer must:

- avoid water temperatures and conditions that encourage the growth of Legionella and other microorganisms (especially water temperatures between 20°C - 45°C, and a supply of nutrients such as rust, sludge, scale, algae, and other bacteria)
- avoid using materials that encourage the growth of Legionella – a unique reference directory of fittings, materials and appliances approved for their compliance with the UK plumbing regulations is available at: www.wras.co.uk/directory
- ensure that water cannot stagnate anywhere in the system by keeping pipe lengths as short as possible, removing redundant pipework (dead legs), and regularly (at least weekly) flush through or use water systems including taps and showers
- keep the system and the water in it clean and de-scale shower heads and hoses at least quarterly

- treat the water to either kill Legionella (and other micro-organisms) or limit their ability to grow
- ensure that the release of water spray is properly controlled; and
- ensure the correct and safe operation and maintenance of the water system.

All the above records must be kept for the period they cover and at least 2 years after. The results of monitoring, tests, checks, or inspections must be kept for a minimum of 5 years.

The testing of water samples in systems should be carried out by a suitably accredited company, at the recommended period or as determined by an appropriate risk assessment.

Employers can get further details on sampling and testing from the Health and Safety Executive - see Technical guidance below.

UCU checklist

1. Does the employer or other duty holder:

- give sufficient training and information to employees about any risks and the necessary measures of prevention and control.
- know about Legionnaires' disease, the risks, and those who are particularly vulnerable.
- have a risk assessment which assesses any sources of risk from Legionnaires', including:
 - air conditioning systems with cooling systems with towers, evaporative condensers, or dry/wet cooling systems
 - hot and cold water systems
 - humidifiers, spa and whirlpool baths, showers, and ornamental fountains
 - other and associated plant and systems
 - conditions that will encourage bacteria to multiply - for example, a water temperature (all or in part of the system) between 20 - 45°C or a source of food such as sludge, scale, rust, algae, or fouling; stored or re-circulated water
 - the production or spread of water droplets - for example from showers or aerosols from cooling towers.
- have in place appropriate measures for the prevention or control of any risk:
 - which in the first instance should be avoided (prevention) so far as is reasonably practicable by looking at the type of water system or method of work used. For example, is it possible to replace a wet cooling tower with a dry air-cooled system?
 - if the risks cannot be prevented, then a written scheme must set out what will be done to control the risks, and must describe:
 - the entire water system (with an up-to-date plan/schematic diagram and an asset register)
 - who is responsible for carrying out the assessment and managing its implementation
 - the safe and correct operation of the water system (including start-up or restarts, and shutdown procedures)
 - what control methods and other precautions will be used (see below)
 - what and how often checks will be carried out on the controls
 - the checks of warning systems
 - maintenance requirements and frequencies
 - operating cycles

- remedial action in the event of the scheme not being effective, and emergency procedures which should include:
 - ◆ shutting down any processes that are capable of generating and disseminating airborne water droplets and keep them shut down until sampling procedures and any remedial cleaning or other work has been done
 - ◆ final clearance to restart the system may be required
 - ◆ to take water samples from the system before any emergency disinfection is undertaken. This will help the investigation of the cause of the illness. The investigating officers may take water samples themselves or require them to be taken by the owner of the water system
 - ◆ to request access to employee health records to discern whether there are any further undiagnosed cases of illness, and to help prepare case histories of the people affected
 - ◆ to co-operate fully in an investigation of any plant that may be suspected of being involved in the cause of the outbreak. This may involve, for example:
 - tracing of all pipework runs
 - detailed scrutiny of all operational records
 - statements from plant operatives and managers
 - statements from water treatment contractors or consultants. Any infringements of relevant legislation may be subject to a formal investigation by the appropriate enforcing authority, which could result in prosecution
 - Data Label: Internal Only Shut down procedures Water systems suspected as being the source of infection will need to be shut down. The appointed specialist legionella contractor will ensure that the water systems are isolated
 - the Person in Control of the Premises must ensure that the area/system/equipment is not used. The appointed specialist legionella contractor will take samples of the potential source and carry out clean/chlorination of the system.
- have in place control measures which include:
 - avoiding water temperatures and conditions that encourage the growth of Legionella and other micro-organisms (especially temperatures 20°C - 45°C, and a supply of nutrients such as rust, sludge, scale, algae, and other bacteria)
 - avoiding the using of materials that encourage the growth of Legionella – the materials should comply with the UK plumbing regulations (see above)
 - ensuring that water cannot stagnate anywhere in the system by keeping pipe lengths as short as possible, removing redundant pipework, and regularly (at least weekly) flushing through or using water systems

- keeping the system and the water in it clean and de-scaled
 - treat the water to either kill Legionella (and other micro-organisms) or limit their ability to grow
 - ensure that the release of water spray is properly controlled
 - ensure the correct and safe operation and maintenance of the water system.
- have a 'responsible person' appointed with sufficient authority and competence (that is with sufficient knowledge, experience, instruction, and/or training on the water systems and the risks) to effectively implement, manage, and monitor the scheme.
 - ensure that any contractors are also competent to work on the water system.
 - keep records of the risk assessments and the control scheme including:
 - the person or persons responsible for conducting the risk assessment, managing, and implementing the written scheme
 - the significant findings of the risk assessment, including precautionary measures and any groups of employees particularly at risk
 - the written control scheme and details of its implementation
 - and the results and dates of any inspection, test, or check carried out, including details of whether and how the system was operating, including stating if it was or was not in use.
 - keep the risk assessment and written scheme under review periodically, and also where there has been a change or reason to suspect that the assessment, controls, or scheme are no-longer valid (see above).
 - consult with the safety reps on the risk assessment including measures of prevention and control, the appointment of the 'responsible person', and the information and training for employees.
 - inform the safety reps, the members, and the HSE if Legionella bacteria are found in the workplace or if a case of workplace Legionnaires' is suspected.

2. Members/Employees:

- if you have symptoms similar to Legionnaires' disease and are worried, you should speak with your doctor
- if a doctor confirms Legionnaires' disease and it may be work related, this should be reported to appropriate management contact, safety rep or branch safety officer, and the occupational health department if there is one.

Further information and advice

Health and Safety Executive (HSE)

Legionnaires' disease: a brief guide for duty holders:

<https://www.hse.gov.uk/pubns/indg458.pdf>

Legionnaires' disease: the control of legionella bacteria in water systems:

<https://www.hse.gov.uk/pubns/priced/l8.pdf>

Legionnaires' disease: Technical guidance Part 1, 2 and 3:

<https://www.hse.gov.uk/pubns/priced/hsg274part1.pdf>

<https://www.hse.gov.uk/pubns/priced/hsg274part2.pdf>

<https://www.hse.gov.uk/pubns/priced/hsg274part3.pdf>

Control of legionella bacteria in water systems: audit checklist:

<https://www.hse.gov.uk/pubns/priced/ck02.pdf>