



**A CODE OF PRACTICE
FOR THE PREVENTION OF
LEGIONNAIRES' DISEASES
IN HOTELS AND OTHER ESTABLISHMENTS**

Department of Health - Malta
March 1999

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The Department of Public Health is committed to safeguard the health of the community and our tourists. We have taken this opportunity to provide a practical guide to assist you in preventing outbreaks of Legionnaire's disease. The information in this leaflet provides information and guidelines to help reduce the risk.

What is Legionnaire's disease?

This is a serious form of infection caused by a type of bacteria known as Legionella. The infection can occur without any symptoms or alternatively can manifest with fever, headache, abdominal pain, diarrhoea and a non-productive cough. At its worst it can cause a severe infection of the lung which carries a 15% fatality rate.

What causes infection?

The Legionella bacteria are commonly found in low, harmless numbers in water, including tap water. They can however multiply to high levels in static or stagnant water; infection is transmitted by breathing water spray or aerosols that contains the Legionella microbes. Infected people are usually sick five or six days after exposure.

Where are Legionella bacteria most likely to be found?

High risk areas which support growth of these microbes include:

- Shower-heads and taps of bathrooms.
- Spas, whirlpools, Turkish baths and saunas
- Ornamental fountains.
- Air-conditioning systems using wet cooling towers
- Hot and cold water tanks particularly if a deposit is present

especially if they incorporate

- Warm and medium hot water (between 20°C and 45°C).
- Pipes with little or no water flow.
- Slime (biofilm) and dirt in pipes and tanks.
- Rubber and natural fibres in washers and seals.
- Scale in showers and taps.

How can the risk be reduced?

It is vital that hotels and other establishments recognise the risk of this infection in their premises. Any clients exhibiting ill health, particularly symptoms normally associated with Legionnaires' Disease, should be referred immediately to a medical practitioner. In addition it is the responsibility of the administration to follow the attached Code of Practice and thus ensure that all necessary preventative measures are in place.

CODE OF PRACTICE

1. Management:

- 1.1 Each establishment should have one named person responsible for Legionella control on the premises. The individual in question should possess knowledge of situations which constitute a risk to Legionella transmission and would normally be a member of the Engineering Department of a grade sufficiently senior to implement any necessary corrective measures.

2. Hot and cold water systems

- 2.1 Water within calorifiers should be maintained at $\geq 60^{\circ}\text{C}$ and not less than 50°C at the outlets. Blending or mixing valves at or near taps may be used to reduce the water temperature to $\geq 43^{\circ}\text{C}$.

- 2.1.1 It should be noted, however, that Legionella bacteria can multiply even in short segments of pipe containing water at this temperature. Increasing the flow rate from the hot-water-circulation system may help lessen the likelihood of water stagnation and cooling. Both "dead legs" and "capped spurs" within the plumbing system provide areas of stagnation and cooling to $< 50^{\circ}\text{C}$ regardless of the circulating-water temperature; these segments may need to be removed to prevent colonisation. Rubber fittings within plumbing systems have been associated with persistent colonisation, and replacement of these fittings may be required for Legionella eradication.

- 2.2 Cold water should be maintained at temperatures below 25°C . This may involve insulating any segments that are exposed to external heat sources.

- 2.4 All taps and showers in guest rooms should be run to waste for a few minutes daily, even if the room is unoccupied.
- 2.4.1 Showers, shower heads and taps should be kept clean and free from scale. The shower heads of hotel rooms should be dismantled and brushed down regularly, preferably between occupancies.
- 2.5 Heat exchangers (calorifiers) should be regularly maintained, at least once a year.
- 2.7 All water filters should be regularly checked and cleaned every three months.
- 2.8 The hot water system should be disinfected with high level (55 ppm) chlorine for 2-4 hours after work on heat exchangers and before the beginning of every season.
- 2.9 Water storage tanks, cooling towers and visible pipe work should be inspected on a monthly basis, ensuring that all coverings are intact and firmly in place.
- 2.10 Any system modifications or new installations must not create pipework with intermittent or no water flow.

3. Evaporative cooling towers

- 3.1 The design and construction of any evaporative cooling tower should be in such a way as to minimise the risk of Legionella proliferation and dissemination.
- 3.2 Treatment of the water to prevent bacterial build-up is mandatory and should be performed by proprietary approval chemical disinfectants or using ultra-violet irradiation.

- 3.3 An itemised schedule of maintenance must be kept by the person responsible and should include intervals at which the necessary inspection, checks and cleaning should be carried out as well as full details of the corrective action.
- 3.4 It is important that the tower water is regularly monitored to detect any conditions which would be conducive to the proliferation of Legionella.
- 3.4.1 On a weekly basis, the water should be tested for the following tests and kept within the stated absolute and preferably relative limits.

Parameter	Relative limit	Absolute limit
pH	7	8
TDS	2000 ppm	2500 ppm
Pond temperature	20°C	25°C
Suspended matter	Cloudy	Turbid
Total bacterial count	10 ⁴ cfu/ml	10 ⁵ cfu/ml

- 3.4.2 It is highly recommendable that the tower water is tested for Legionella bacteria. This should preferably be performed at a minimum six-monthly frequency.

4. Drains

- 4.1 Drains from aircooling coils should be trapped and with an airbrake as with all drains.
- 4.2 Collecting trays should be sloped to encourage rapid run off of water.
- 4.3 Drains' connections should not protrude above the base of the tray since this will result in stagnant pools of water.

5. Humidifiers

- 5.1 Humidifiers where necessary are recommended to be of the direct steam injection type.
- 5.2 Spinning disc type and similar water based type of humidifiers should be avoided as far as possible.

6. Whirlpools, spas, fountains or water cascades

- 6.1 Any source of aerosol formation should be subject to the same standards of maintenance and care stated in 3.1. If recirculating water is present, it should be chlorinated to ensure a constant free chlorine concentration of not less than 3 ppm.
- 6.2 Regular monitoring on a suggested weekly frequency should be undertaken to include the following parameters:

Parameter	Relative limit	Absolute limit
pH	7	8
Suspended matter	Hazy	Turbid
Total bacterial count	10^4 cfu/ml	10^5 cfu/ml
Coliform count	/	Absent in 100mls

7. Further information

These guidelines are not intended to be a comprehensive engineering text and readers are advised to consult further publications such as Technical Memorandum TM13 (Minimising the risk of Legionnaires' Disease) issued by the Chartered Institute of Building Services Engineers - UK.

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