

Plumbing Regulation News Update

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Legionella bacteria traced to commercial car wash

PURPOSE

This Plumbing Regulation News Update is to inform local government and the plumbing industry of a newly identified public health danger when Legionella bacteria may present in the aerosols created by commercial car washing operations.

SIGNIFICANCE

A car wash in Melbourne has been linked to an outbreak of Legionnaires' disease, an occurrence which appears to be the first of its kind reported worldwide. The outbreak has resulted in seven people being hospitalised, and led to rapid action by health authorities to manage this previously unsuspected source of public health risk.

BACKGROUND

Legionnaires' disease is a type of pneumonia caused by infection with bacteria of the genus Legionella. The majority of cases are caused by Legionella pneumophila, but several other species are also known to cause the illness. Onset of the disease can be up to 10 days after the initial contact with the bacteria. Those most at risk of infection are the elderly, smokers and those with pre-existing conditions affecting the immune system. The illness can be fatal. Legionella infection may also produce a less severe illness called Pontiac fever which is characterised by short-term flu-like symptoms. Legionellosis is a notifiable disease in Australia, with between 300 and 350 cases recorded annually in recent years. Legionella infections cannot be transmitted from person to person.

Legionella bacteria occur naturally in the environment, mainly in water and soil. These organisms are normally present in very low concentrations but can increase markedly in human-made aquatic environments with warm water (25 to 45°C), particularly if water is recirculated and a disinfectant residual is not maintained. Legionella bacteria may occasionally occur in disinfected tap water supplies, and may also persist in biofilms and inside amoeba which can provide some protection against chemical disinfection agents.

In order for the bacteria to cause an infection, they need to be inhaled in the form of particles which are small enough to reach the lower regions of the lung but large enough to contain at least one bacterial cell. The combination of warm water environments with processes that generate fine aerosols (1 to 3 microns in diameter) provides ideal conditions for Legionella outbreaks to occur. Until now, in Australia and other countries, outbreaks of Legionnaires' disease have mainly been linked to aerosols generated by air conditioner cooling towers. The infectious dose for Legionella has not been defined but water sources associated with outbreaks have generally been reported to contain concentrations of 10,000 to 100,000 colony forming units per litre or more.

MELBOURNE CAR WASH OUTBREAK

The first case in the Melbourne car wash outbreak was notified to health authorities in late April 2008, and by early May two more cases had been reported. All three victims lived in the western suburbs of Melbourne and investigations focused on potential exposures from cooling towers in this area. On 5 May an alert was issued by the Victorian Chief Health Officer to hospitals and General Practitioners in the area informing them of the outbreak and asking them to consider the possibility of Legionnaires' disease for patients presenting with flu-like or pneumonia symptoms.

On 8 May health authorities announced that a further two cases had been identified, and that investigations were now concentrating on cooling towers in or near two local shopping areas. The cooling towers were being tested and then disinfected as a precautionary measure, but none had yet been found to be positive for Legionella bacteria. All cooling towers in the state of Victoria are required to be registered under legislation passed in 2001 following a major Legionella outbreak which resulted in 125 cases and four deaths. The registry permits rapid identification and testing of suspect towers whenever Legionella cases are reported.

According to media reports, the possibility of a link to a local car wash was announced on 9 May by a spokesman for the Department of Human Services Victoria who stated that the car wash owner had voluntarily closed the business as a precautionary measure until water test results had been obtained. On 20 May the Chief Health Officer announced that multiple water samples taken from the car wash had been confirmed to contain Legionella of the same species as the infected cases. Investigations had also established that water at the car wash was being heated to approximately 40°C and stored in a tank before being sent through the system to the outlets. This temperature provides an excellent condition for Legionella growth. The high pressure spray hoses used in this "do it yourself" car wash then created a situation where customers were exposed to respirable-sized aerosols. Contrary to initial media reports, the facility did not recycle water on-site, but used only tap water for car washing. The car wash re-opened several days later after disinfection procedures and further water testing had been carried out to ensure that the Legionella bacteria had been eliminated.

RESPONSE AND RISK REDUCTION MEASURES

As a result of this incident, the Victorian Public Health Branch has consulted with the car wash industry to establish new guidelines to prevent further outbreaks ⁽¹⁾. These guidelines emphasise the need for proper management of warm water systems in order to prevent the growth of Legionella. According to the Department of Human Services Victoria, discussions with the industry have indicated that the majority of car wash premises have at least some part of their process that involves the heating and storage of warm water. If such components are designed to supply water at temperatures between 30 and 60°C, then they would fall under the definition of a warm water system in the Health (Legionella) Regulations 2001. These regulations specify requirements for disinfection, maintenance, testing and record keeping for such systems. Other risk reduction measures which may be considered by car wash operators are the elimination of warm water storage, or raising water storage temperatures to 60°C or higher in order to kill any Legionella bacteria.

SIMILAR PREVIOUS INCIDENTS

This outbreak closely follows two previous reports of Legionella cases associated with the use of high pressure spray devices. The first incident occurred in Auckland, New Zealand in early 2006 but was reported only recently⁽²⁾. Four cases of Legionellosis were identified in a small coastal suburb. Epidemiological and environmental investigations suggested exposure to aerosols from a high pressure "water blaster" used to clean boats was the likely infection source for at least two of the cases. The water blaster was supplied with chlorinated bore water but the water supply may have been contaminated with soil during repair of a mains leak. Overnight storage of water in a reservoir tank and 30 metre hose during the summer season may have provided warm conditions permitting Legionella to grow. The second incident in mid-2007 involved two workers at a bus depot in Troy, New York. Legionella infections in a mechanic and a bus driver were attributed to spray exposure from bus washing equipment. Media reports of this incident suggest that water was being recycled on-site, and that high pressure spray devices were being used.

An outbreak of Pontiac fever affecting 15 workers at a US factory has also been attributed to using high pressure spray devices to wash equipment, in combination with a water source containing high levels of Legionella bacteria.

CONCLUSION

These outbreaks highlight the potential for changing water use practices to give rise to situations which may generate new public health risks. High pressure spray devices are becoming more common in Australia in both domestic and industrial settings as water shortages worsen across the country. Characterisation of the aerosols produced by such devices suggests they may increase exposure to respirable aerosols compared to conventional trigger nozzles⁽³⁾. The “do it yourself” style of car wash using such high pressure sprays is also becoming more common in comparison to the traditional “drive through” style. Water restrictions in Victoria currently ban the use of tap water for washing cars at home except for cleaning of windows and lights, and spot cleaning of corrosive substances, however use of water-efficient commercial car washes is permitted.

These trends are resulting in increasing numbers of people being exposed to water aerosols in the respirable size range and, as illustrated by this outbreak, there is the potential for public health risks to arise if relevant water quality issues are not adequately assessed and managed.

(1) www.health.vic.gov.au/environment/legionella/car_washes.htm

(2) A Legionnaires' disease outbreak: A water blaster and roof-collected rainwater systems. Simmons G et al. Water Research 42 (2008) p1449 - 1458.

(3) A Series of Exposure Experiments – Recycled Water and Alternative Water Sources: Part A Aerosolizing and Endotoxin Experiments. Research Report 45. CRC for Water Quality and Treatment. www.waterquality.crc.org.au/publication_occpr_resrpts.htm

(Information in this Advisory Note was derived from Health Stream Article - Issue 50 - June 2008).

MORE INFORMATION ABOUT LEGIONALLA

Plumbing Regulation Advisory Note No. 01/03 (April 2003)
http://www.wst.tas.gov.au/_data/assets/pdf_file/0016/75220/No_1_03.pdf

See also the Tasmanian Department of Health and Human Services website:

http://www.dhhs.tas.gov.au/service_information2/information/legionella_pneumophila

http://www.dhhs.tas.gov.au/service_information2/information/legionella_longbeachae

MORE INFORMATION ABOUT PLUMBING REGULATIONS

The **Plumbing Regulations 2004** is available online at: www.thelaw.tas.gov.au

The **Tasmanian Plumbing Code 2006** is available online at:
http://www.wst.tas.gov.au/industries/plumbing/plumbing_code

For details about the *Plumbing Regulations 2004* and the *Tasmanian Plumbing Code 2006* contact your local council or Workplace Standards Tasmanian Helpline:

Phone: (in Tasmania) 1300 366 322; Phone: (outside Tasmania) (03) 6233 7657 Fax: (03) 6233 8338

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