

UPDATE ON LEGIONELLA & WATER QUALITY IN HEALTHCARE FACILITIES

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STATE AND NEW NATIONAL GUIDELINES

There is now a driving force to have national guidelines specific to managing potable water in healthcare facilities. Potable water healthcare guidelines are already in place in Queensland. However, the other states and territories are presently lacking such specific guidance. National enHealth draft guidelines were released earlier this year for stakeholder comment and are expected to warrant site specific risk management of potable water systems, through identification and analysis of the system processes and associated risks.

Water system risk needs to be assessed in conjunction with analysis of clinical profiles to assess occupants risk to exposure. To undertake these two areas of risk assessment effectively a multidisciplinary team must be formed, composed of members of the clinical team and the facility management. To maintain water quality within a facility, management should take a proactive approach and work together with contractors and facility staff to implement risk management strategies. It is still too early at this stage to know the precise details of the National guidelines and when they will be rolled out nationally, however, managers can take active steps now to minimise their site risks.

Healthcare management also must fulfil their obligations to protect workers, as well as site occupants. The national harmonisation of workplace health and safety legislation has now been adopted by most states and territories in

Australia. The legislation requires risks to be eliminated so far as is reasonably practicable, and otherwise, to minimise those risks so far as is reasonably practicable. Due diligence is required to ensure the safe environment for staff, visitors and patients, including the minimisation of microbial risks. Implementing a site management plan and documenting risk mitigation strategies is vital when proving due diligence to the regulator.

The Australian Building Codes Board (ABCB) is currently undertaking preliminary research in a number of plumbing areas. One such research focus is on warm water systems. A review of draft material for the design, installation and maintenance of warm water systems has been issued for stakeholder comment on their website. In the research draft they discuss branch lengths from the warm water system and thermostatic mixing valves, which is useful for designers and plumbers to consider. They also discuss "monthly" pasteurisation where warm water systems are heated to above 70°C for a minimum of one hour. In theory this is fine, however, the code does not address issues of some larger systems that are not capable of flushing each outlet for a minimum of five minutes, whilst maintaining the pasteurisation temperature. It is important to note that pasteurisation is only a very short term measure if the system is infected. We strongly encourage industry stakeholders to read this ABCB released draft and provide their personal experience feedback and recommended strategies to the board.

Experts and plumbing professional have been voicing their concerns that *AS/NZS 3500 Plumbing and Drainage* is not adequate to manage microbial risks associated with commissioning and construction of potable water systems in healthcare facilities. Some of the currently available guideline documents only cover hospital operational management of the water system and lack guidance material for the construction industry. Other documents are purely focused on warm water and fail to suitably address possible issues with hot and cold systems. *AS/NSZ 3500* should be reviewed and updated to specifically address microbial risks in potable water and thus prevent costly and delayed openings for hospitals and health services. The costs are not purely financial but also include the cost to the local community who are then denied access to vital healthcare.

The current standard, *AS/NZS 3896:2008 Waters—Examination for Legionella spp.* including *Legionella pneumophila*, which is suitable for testing treated and untreated water is considered by some local and international experts as outdated. There has been discussion that a new standard is being developed for *Legionella* testing in potable water which will have a lower detection limit. This new standard may be available for draft review as early as next year.

New technologies for rapid detection of *Legionella* are now available to provide crucial results in a timely manner. The difficult choice now facing facility managers is whether to use the Australian standard method that takes up to ten days to receive a result or use a rapid method and receive results in a few hours.

A much needed review of detection methods needs to be undertaken to better assist the healthcare community to respond to *Legionella* issues quickly and cost effectively. The CETEC team uses both methods for most projects.

LEADING HEALTHCARE FACILITIES

Some healthcare facility designers and builders are leading the way to implanting best practice. They have removed the risk of *Legionella* growth within warm water pipework by adopting point of use thermostatic mixing valves (TMVs). Initial implementation costs are more expensive due to the requirement of more TMVs rather than the traditional design of one TMV serving several outlets. However, there are benefits, as servicing point-of-use TMVs is faster and can be done by a single licensed plumber, rather than two. Overall, the operational and servicing costs increase only marginally, due to the increase in the number of TMVs onsite.

Many healthcare facilities have introduced onsite dosing systems. Onsite disinfection of the water supply (mainly by chlorination) has increased the overall level of control that the facility operators have over their potable water quality. Onsite chlorination allows for an improved response to microbial issues. Careful planning is essential when installing onsite dosing equipment, as it can lead to other risks such as corrosion, incorrect storage of dangerous goods and in some cases dangerous levels of chemical by-products. Onsite dosing is only effective if used in conjunction with an appropriate microbial water quality plan that correctly manages all stages of the potable water supply.

Leading healthcare facilities are also updating their hydraulic drawings and systematically removing dead legs within their facility. Facilities should update their hydraulic drawings whenever new works are carried out and have policies in place that prevent contractors creating new dead legs. For the management

of dead legs, it is cost effective to be proactive when running or designing a new facility rather than being reactive.

POOR DESIGN IS VERY EXPENSIVE

When a healthcare facility is poorly design and commissioned it can have devastating legacy issues.

If the flushing and disinfection of plumbing infrastructure is not correctly conducted during the commissioning phase it can have long lasting effects on the water quality within the hospital and can delay opening of the facility. It is vital that professionals constructing potable water systems are clear on what process need to be conducted and the reasoning behind it, as well as compliance to guidelines since Australian standards are lagging on this subject.

The use of materials that degrade when exposed to disinfection chemicals must be avoided. Also the design of plumbing fittings must not allow for substantial

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Debris found in top aerator is an ideal breeding ground for bacteria and *Legionella*

microbial growth. Water saving devices need to be checked for their potential to allow for microbial colonisation and including low flow stagnation.

Warm water systems that cannot be effectively pasteurised on a regular basis are common in many older facilities across Australia. As *Legionella* proliferates in warm water in the temperature range of 20°C to 50°C, these systems can quickly become colonised by *Legionella* which will shut down normal operations. Often high microbial results in a single warm water outlet are ignored by facility management and area restrictions are the only control measure employed. Poor management of an isolated high microbial result is highly likely to lead to widespread contamination. Once widespread contamination occurs, more extensive remediation strategies must be introduced to keep the facility operational. Facilities using warm water need to conduct a comprehensive system review and implement correct control measures. Eliminating the hazard that warm water system pose by simply upgrading to a hot water circulation design will not, in most cases, be possible due to budgetary restraints. Experienced professionals should be engaged to assess what options are suitable and practical for each individual site.

Designers and engineers should be aware of water microbial risks from the very conception of a healthcare facility through to its development, construction and operation. Water microbial risk management needs to be integrated into everyday operation. Some healthcare facilities are striving to achieve best practice principles for their potable water management, while most are still unclear on how to achieve optimal risk minimisation. Guidelines and standards need to be either introduced or updated to assist with this process and correctly control *Legionella* risk.

ABOUT THE AUTHORS

Josiah Padget, Consultant and Dr Vyt Garnys, Managing Director at CETEC Pty Ltd. CETEC were members of the Technical Advisory Panel for Queensland Health, which developed the Guidelines for Managing Microbial Water Quality in Healthcare Facilities (2013) and CETEC has also provided content for the National enHealth guidelines (not yet finalised).. The CETEC team has been conducting water risk assessments since 1987. The team can be contacted on 07 3808 8948 | 02 9966 9211 | 03 9544 9111 or at www.cetec.com.au

Travis Hale and Dr Vyt Garnys, CETEC presenting at Legionella Control



As an impressive, generous and informative gesture, Uniting Care's The Wesley Hospital in Brisbane shared its experience and those of invited experts, at their **Legionella Control Conference** on 14th November.

The highlights included:

- A comparison of the lower acceptable Legionella limit in Europe
- Disinfection alternatives
- Advanced molecular techniques of detection
- How The Wesley Hospital recovered from an infection episode
- Engineering controls – including removal of dead legs
- Ice machines and other sources of infection
- The need for a team approach

CETEC gave an invited presentation and was a panel member of the evening's Q&A session.