



Management of Dental Unit Water Lines: Recommendations for practice.

Background

In 2012, a case report published in *The Lancet* confirmed that an 82-year-old woman in Italy had died from Legionnaires' disease associated with a strain of *Legionella pneumophila* genetically identical to one isolated from the dental unit waterlines (DUWLs) of a dental practice she had attended in the past 10 days. Following heightened awareness of the infectious risk from contaminated DUWLs, Health Protection Scotland (HPS) was asked by Scottish NHS Boards to provide guidance for healthcare workers on the appropriate disinfection of DUWLs within the dental chair unit (DCU) – a reusable medical device.

Methods

A scientific literature review was undertaken to review the extant literature regarding the appropriate management (including decontamination) of dental unit waterlines (DUWLs) for the prevention of healthcare-associated infections. Critical appraisal of the studies included in the review and considered judgement of the evidence was carried out by the lead reviewer using the Scottish Intercollegiate Guidelines Network (SIGN) methodology.

Results

The literature search identified 295 articles. After the first and second stage screening 46 articles were included for critical appraisal.

As a reusable medical device under the European Union Medical Devices Directive, dental chair units (DCUs) must be maintained according to the manufacturer's instructions. Accordingly, DCU manufacturers may endorse a specific commercial product to disinfect DUWLs; however, unless a DUWL biocide is considered incompatible with the unit, a variety of products are likely to be available for this purpose. The limited evidence available from published research supports the recommendation that continuous agents should preferably be used, based on peroxide compounds.

Discussion

A number of recommendations have been made for practice within Scottish Dental Practices. The recommendations cover;

- Risk assessments
- Technical requirements water supply management
- Infection control management
- Flushing management
- Decontamination
- Microbiological requirements
- Monitoring test kits

A checklist of key requirements for the risk assessment of hot and cold water systems for *Legionella* control has been developed to support dental practices with their *Legionella* risk control within their DUWLs. (See attached)

Appendices with key requirements for *Legionella* control schemes, water sample collection for *Legionella* sampling and action Levels for *Legionella* sampling are also provided.

Authors: Hayley Kane, Heather Wallace, Jenny Longstaff and Annette Rankin

Health Protection Scotland, NHS National Services Scotland, Glasgow, UK

Legionella Risk Assessment Checklist for Hot and Cold Water Systems in Dental Settings

Key requirements (derived from BS 8580 'Water quality, Risk assessments for *Legionella* control')

In sections 1-2 confirm Yes, No or N/A
In section 3 Tick box ✓ to confirm action

Section 1: Roles and Responsibilities

- | | | | | |
|-----|---|-----|----|-----|
| 1.1 | Are details of management personnel involved in legionella risk assessment documented? Check names, job titles and contact information for dutyholder, appointed responsible person(s), deputies, service providers (e.g. water treatment suppliers, cleaning and disinfection service providers) are included. | Yes | No | N/A |
| 1.2 | Are competency assessments and training records available for those associated with legionella risk assessment and control? | Yes | No | N/A |
| 1.3 | Are roles and responsibilities for employees, contractors and consultants clearly identified and documented? | Yes | No | N/A |

Section 2: Legionella Water System Risks and Controls

- | | | | | |
|-----|--|-----|----|-----|
| 2.1 | Is water stored or re-circulated as part of the system? (e.g. check water is not retained overnight in DUWLs or stored in a water tank) | Yes | No | N/A |
| 2.2 | Is water temperature in all or some part of the system between 20 and 45°C? (e.g. a DCU water heating unit or a temperature rise in DUWLs following continuous use over several hours) | Yes | No | N/A |
| 2.3 | Are deposits that support bacterial growth, such as rust, sludge, scale and organic matter (e.g. DUWL biofilm visible)? | Yes | No | N/A |
| 2.4 | Are the following actions being taken to minimise <i>Legionella</i> transmission as part of the <i>Legionella</i> Control Scheme? | Yes | No | N/A |
| | – Assessment of the water system for any potential risk of contamination with <i>Legionella</i> spp. and other material and implementation of control measures | Yes | No | N/A |
| | – Assessment of the potential for <i>Legionella</i> spp. to grow within the system and planning, implementation and evaluation of controls such as: | Yes | No | N/A |
| | - chemical and physical water treatment measures | | | |
| | - disinfection and cleaning regimes | | | |
| | - remedial work and maintenance | | | |
| | – Regular monitoring of the effectiveness of the control measures and implementation of corrective actions where necessary | Yes | No | N/A |

Section 3: Legionella Water System Risks and Controls where additional control measures are required as part of the legionella control scheme*

- | | | |
|-----|---|--------------------------|
| 3.1 | The scope of the assessment (i.e. the details and entirety of the plant being assessed) is described | Tick |
| 3.2 | Assessment of the validity of the schematic diagram which should include all parts of the system where water may be used or stored has been undertaken | <input type="checkbox"/> |
| 3.3 | Details of the design of the system, including an asset register of all associated plant, pumps, strainers, outlets and other relevant items are recorded | <input type="checkbox"/> |
| 3.4 | Evidence of the competence of those involved in control and monitoring activities is available | <input type="checkbox"/> |
| 3.5 | A review of the legionella written control scheme, including management procedures and site records or logbooks, which include: system maintenance records; routine monitoring data; water treatment and service reports; cleaning and disinfection records; and <i>Legionella</i> spp. and other microbial analysis results are complete | <input type="checkbox"/> |

*Applicable where risk is not mitigated e.g. changes to the water system or a significant legionella breach arises