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• The Chlorine Dioxide Consultancy
  • Water Testing & Compliance
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Legionella, Pseudomonas and waterborne pathogens within the Healthcare environment – cutting a pathway through water systems.

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Continually in the news - 2011/2012

Legionella

Guernsey – Jan 2012

NHS Lanarkshire fined £24k from Nov 2008 - Jan 2012

Dumfries Infirmary “clean up” - Oct 2011

Hospitals ...... Trains ...... Leisure Centres ..... Hotels ..... Factories ...... Offices ....

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Legionella

Dry Ski Slope – Tyne & Wear - Aug 2011

Leisure Complex in Scotland - Aug 2011

Diamante Beach Hotel - Jan 12
Three pensioners on holiday died from Legionella

Hospitals ...... Trains ...... Leisure Centres ..... Hotels ..... Factories ...... Offices ....

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Legionella / Pseudomonas

Reported in “The Lancet” – Feb 2011

82 year old dies from Legionella follow dental procedures - Tested by Legionella Pneumophila using Antigen Test

The challenges :-

• Low water volume
• Frequency of use
• Disinfection
• Filtration
• Temperature

Dental Chairs

Hospitals ...... Trains ...... Leisure Centres ..... Hotels ..... Factories ...... Offices ....

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Pseudomonas

Neonatal deaths in Northern Ireland - Jan 2012


• Dept of Health - CMO - issue update for Pseudomonas aeruginosa infection from Taps & Water systems in augmented care units¹ - 6th Feb 2012

• ¹ Examples “augmented care units” – high dependency, adult, paediatric & neonatal critical care, renal, transplant haematology and burns units.

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Pseudomonas aeruginosa

Anti-biotic resistant

From a simple rash through to chronic infection which can lead to death.

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1. Best Practice for hand wash stations to minimise the risk of *Pseudomonas aeruginosa* contamination

1.1 Only use the hand wash station for hand washing
   - Do not dispose of body fluids at the hand wash basin – use the dirty utility area.
   - Do not wash any patient equipment in hand wash basins
   - Do not use hand wash basins for storing used equipment awaiting decontamination
   - Wash patients, including neonates, on augmented care units2 with water from outlets demonstrated to be safe established by water sampling and risk assessment.

1.2 Use all hand wash stations regularly

1.3 Flush all taps on augmented care units regularly (manually or automatically) and keep a record of when they were flushed.

1.4 Identify any problems or concerns relating to safety, maintenance and cleanliness of hand wash stations to the Infection Prevention & Control team and the Estates and Facilities Department

1.5 Maintain good dialogue and communication between the Director of Infection Prevention and Control, the Infection Prevention and Control, Estates and Augmented Care Unit(s) teams at all times.

1.6 Do not locate alcohol gel dispensers at hand wash stations – locate at the point of care or use individual hand-rub dispensers

1.7 Use pre-filled single-use bottles for alcohol based hand rubs or cleaning solutions. Do not top-up cleaning spray, alcohol or other bottles.

1.8 Ensure that cleaning staff have been trained on the correct cleaning procedures for taps and sinks and follow the guidance in the Healthcare Cleaning Manual for cleaning hand wash basins paying particular attention to lime scale deposit. See [http://www.nrls.npsa.nhs.uk/resources/?EntryId45=61830](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=61830)

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2 For example high dependency, adult and neonatal critical care, renal, transplant, haemato-oncology and burns units
2. Best Practice for assessing and managing the risks* in augmented care units to minimise the risk of *Pseudomonas aeruginosa* Contamination

2.1 Set up a Water Safety Group to develop a water safety action plan for the Trust - see link for more information [http://whqlibdoc.who.int/publications/2011/9789241548106_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241548106_eng.pdf)

2.2 Trusts should develop a risk assessment and written scheme specific to *Pseudomonas aeruginosa* in addition to that in place for *Legionella*. The risk assessment should identify elements such as: at risk patients and services, the suitability of the water distribution system – including types of taps used, identifying under-used outlets and hand wash basins, use of flexible hoses.

2.4 Ensure a policy is in place to demonstrate compliance with the Code of Practice for the prevention and control of infections and related guidance2.

2.5 Ensure the details of the Responsible Person (Water) as required by HTM 04-01 are easily accessible.

2.6 Ensure taps and thermostatic mixing valves (manual and automated) have been commissioned (including programming auto flushing cycles), and routinely validated, as per the manufacturer’s instructions.

2.7 Advice can be obtained from the Health Protection Agency via the Regional Microbiologists and Health Protection Units where concerns are identified

* Technical guidance on testing, sampling and managing the risk of *Pseudomonas aeruginosa contamination in augmented care units* will be published at the end of March 2102

1 For example high dependency, adult and neonatal critical care, renal, transplant, haemato-oncology and burns units

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Case Study - Patient acquired Pseudomonas - Hospital water system tested and found to be positive for Pseudomonas Aeruginosa.

- Instigated immediate tank clean and disinfection using chlorine & chlorine dioxide
- Capital project and emergency funding to replace water tanks.
- Review flushing regime and little used outlets
- Implement continuous dosing of chlorine dioxide at elevated levels
- Seek out flexible hoses and implement a programme of change
- Re-write the Legionella Policy & Procedures to embrace a “Water Hygiene Policy”
- Involve ICT, Nursing and Cleaning personnel
- Evolve a water testing programme that could handled by the Estates team whilst allowing sufficient time to be reactive in the event of OOS results.

Source identified as most likely from tank lining which had blistered and allowed pockets of Pseudomonas to develop within the blistered coating.
**Case Study** - Recurring Legionella failures within hospital water testing programme.

- Instigated immediate review of policy and procedures.
- Complete audit of sampling & testing procedures including alternative laboratory
- Complete audit of water temperatures across site, especially at plant rooms
- Review the existing chlorine dioxide treatment regime.
- Seek out flexible hoses and implement a programme of change
- Involve ICT, Nursing and Cleaning personnel in improving the flushing regime.
- Implement a programme for testing BMS temperature sensors.

Contractors had installed pipework during refurbishment programme without authorisation from estates creating "dead-legs"
SUMMARY

- Ensure all personnel involved with water receive training and understand the issues involved - AWARENESS

- Ensure the “Responsible Person” has the depth of knowledge required to appreciate many of the difficulties in operating water systems - ACCOUNTABILITY

- Constantly review “Risk Assessments” and keep a working diary of events so that back tracking and reviews are far quicker – saving time & money -

- Consider changing “Legionella Policy, procedures and Risk Assessment” into a “Water Hygiene set of documents that will embrace a far wider range of waterborne pathogens.

- Develop a micro-biological water testing strategy

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SUMMARY

• Primary Control mechanisms
  ✓ Temperature
  ✓ Flushing
  ✓ Review of “little used” outlets
  ✓ Flexible hoses
  ✓ Expansion vessels
  ✓ Dead-legs
  ✓ Condition of water tanks and pipework

• Secondary Control mechanisms
  ✓ Pasteurisation
  ✓ Biocide – e.g. Chlorine Dioxide
  ✓ Micro-biological testing
  ✓ Shock disinfections
  ✓ Maintenance of outlets – e.g. Sensor taps
SUMMARY

Control measures in L8 / HTM04 will prevent cases:

• Too frequently not implemented properly

• Too much & inappropriate sampling and over-reaction to the results

• Too many TMV’s and Sensor Taps

• PFI’s can be difficult to manage

• Over-reliance on disinfection – part of the story....

• Not enough good design – need to involve water hygiene specialist early in the design concept and review before commencement

• No matter what the salesman says there is no panacea and there will always be some colonisation in shower hoses and downstream of TMV’s
Remember me when I needed you most!
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Thank you for listening

Questions

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