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HTM04-01
The Water Management Group

Objectives

Water Safety Groups & Water Safety Plans

- What are they?
- What are members responsible for?

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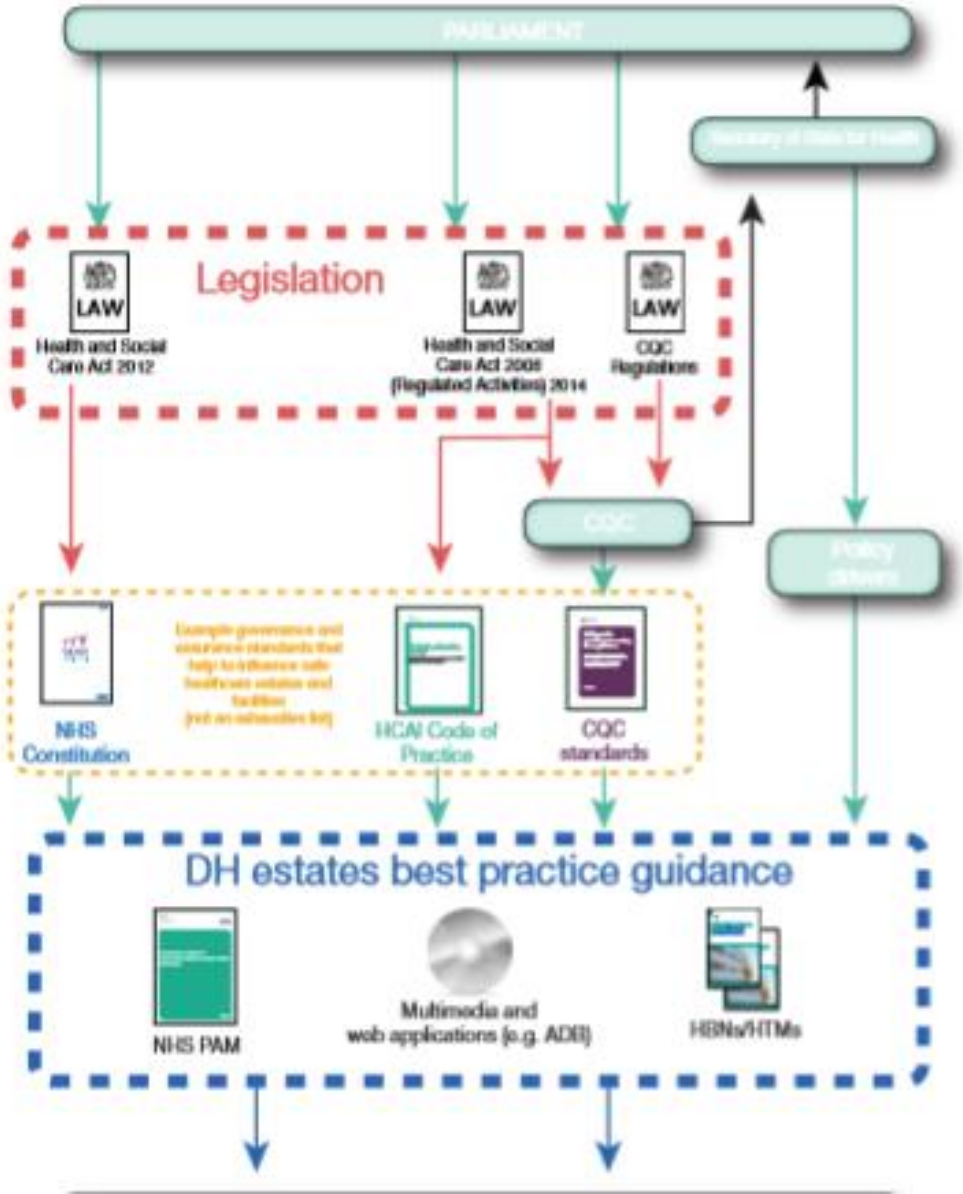
Healthcare Legislation



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HTM 04-01

Safe Water in Healthcare Premises

- Conduct Risk Assessments
- Prevent or control exposure
- Maintain, check & test control measures
- Provide information, instruction & training
- Water Safety Groups & Plans

HTM 04-01 Part A: design, installation and commissioning

PDF, 1.19MB, 94 pages

HTM 04-01 Part B: operational management

PDF, 3.67MB, 98 pages

HTM 04-01 Part C: Pseudomonas aeruginosa – advice for augmented care units

PDF, 4.2MB, 20 pages

HTM 04-01 supplement: performance specification D 08 - thermostatic mixing valves (healthcare premises)

PDF, 3.27MB, 63 pages

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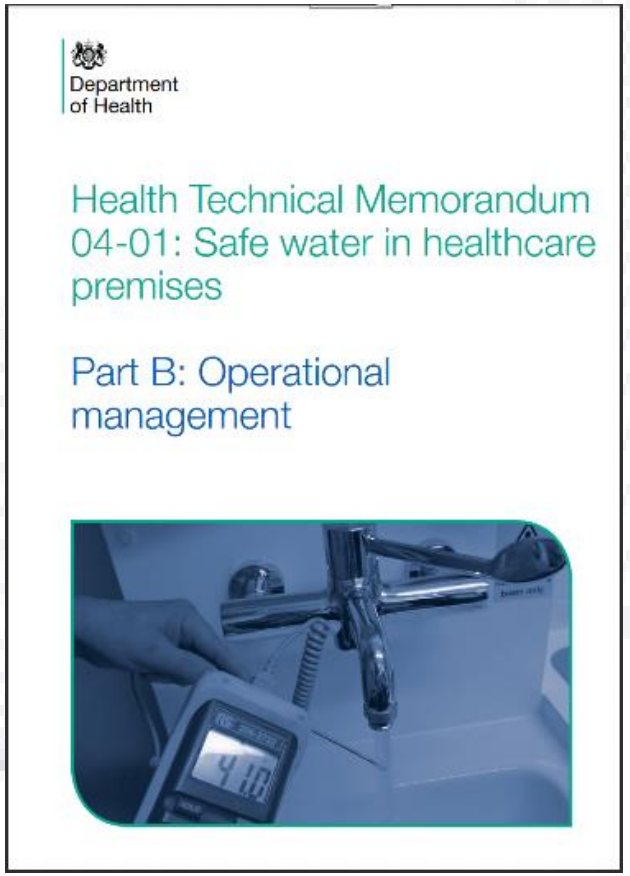
https://www.gov.uk/government/publications/hot-and-cold-water-supply-storage-and-distribution-systems-for-healthcare-premises

HTM 04-01 – Part B

Provides guidance on:

- Constructing a WSG
- Developing WSP's
- Assessing patient risk
- Remedial actions
- Protocols for sampling and monitoring



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Water Safety Management

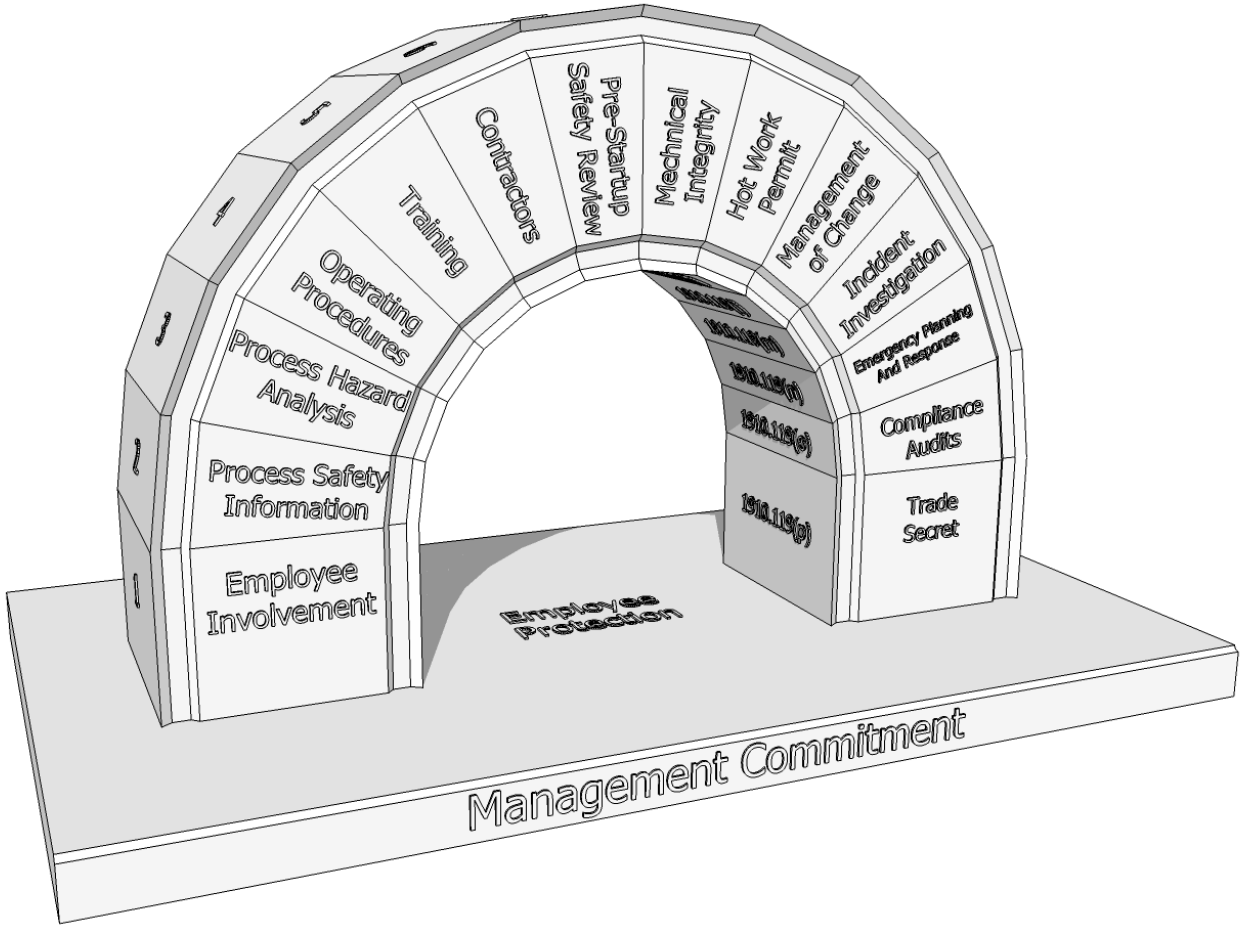

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Image courtesy of Khamar

The Water Safety Group

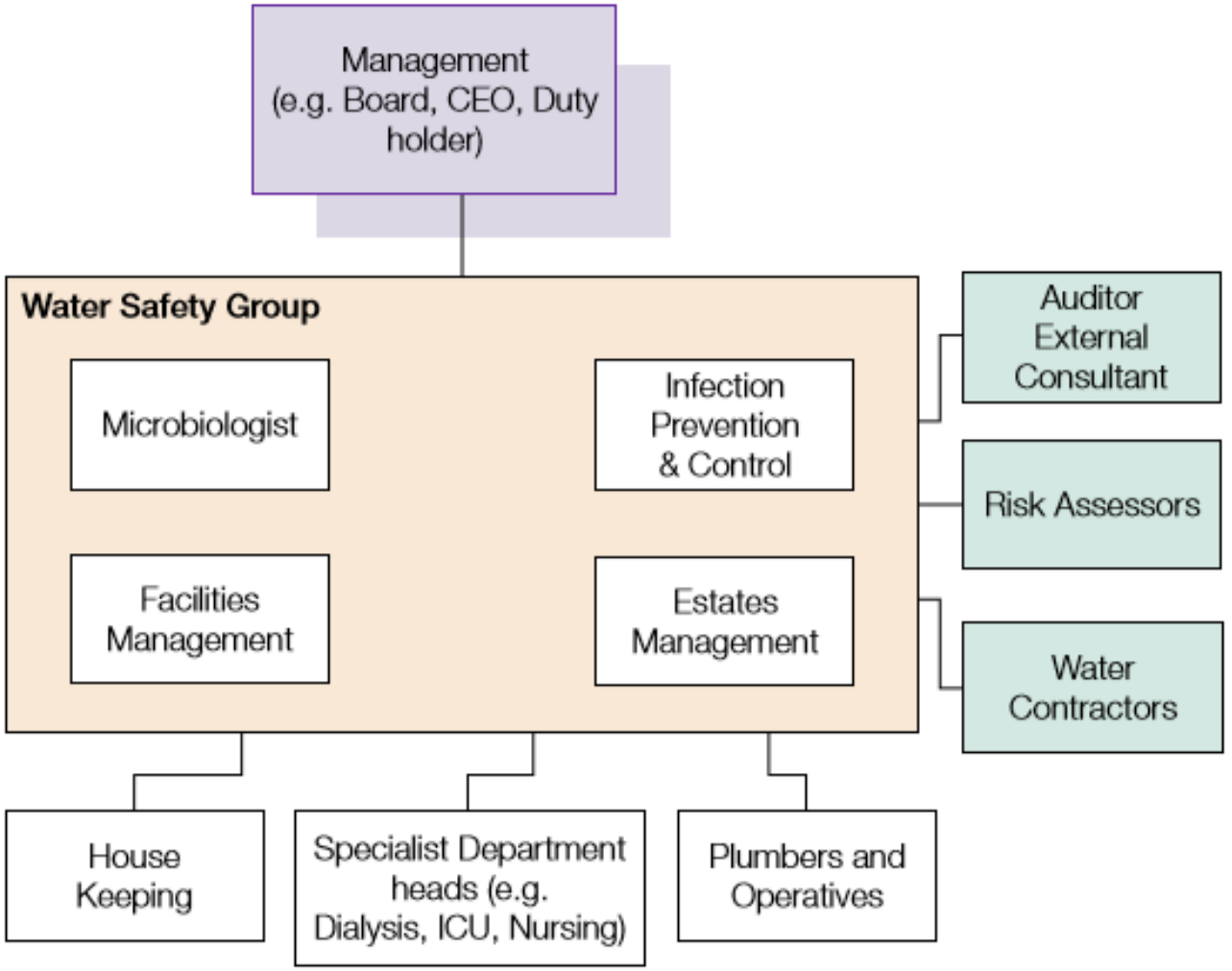

Figure 2 Example WSG structure

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Water Safety Plans

1 Water Safety Group
2 Schematics
3 Hazards and Risks
4 Control Measures
5 Operational Limits
6 Monitoring
7 Corrective Actions
8 Record Keeping
9 Validation/Verification
10 Audit

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Schematics

- Document and describe the system
- Review existing schematics or construct new
- Ensure all relevant items are included in asset register

Image courtesy of bls.gov

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Hazards and Risks

- HACCP approach
- Undertake hazard analysis and risk characterisation

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Consider **All** Water Sources

Drinking water
- Tap/bottled
- Plumbed dispenser/ice/vending machines
- Food/baby milk preparation

Domestic hot & cold water
- Bathing/showering/hairdressing
- Dish/potty washers

Equipment
- Endoscope washers/RO systems
- Heater coolers
- Nebulisers/Clinical humidifiers
- Dental chairs
- Dialysis
- Sensory tubes
- Podiatry/Wound care

Pools
- Hydrotherapy
- Birthing
- Whirlpool footbaths

Building services
- Ventilation systems
- Room humidifiers

Cleaning equipment
- Carpet washers
- Steam cleaners
- Sanitisers
- Cloths
- Mops

Toilets
- Flush/spray

Holy Water

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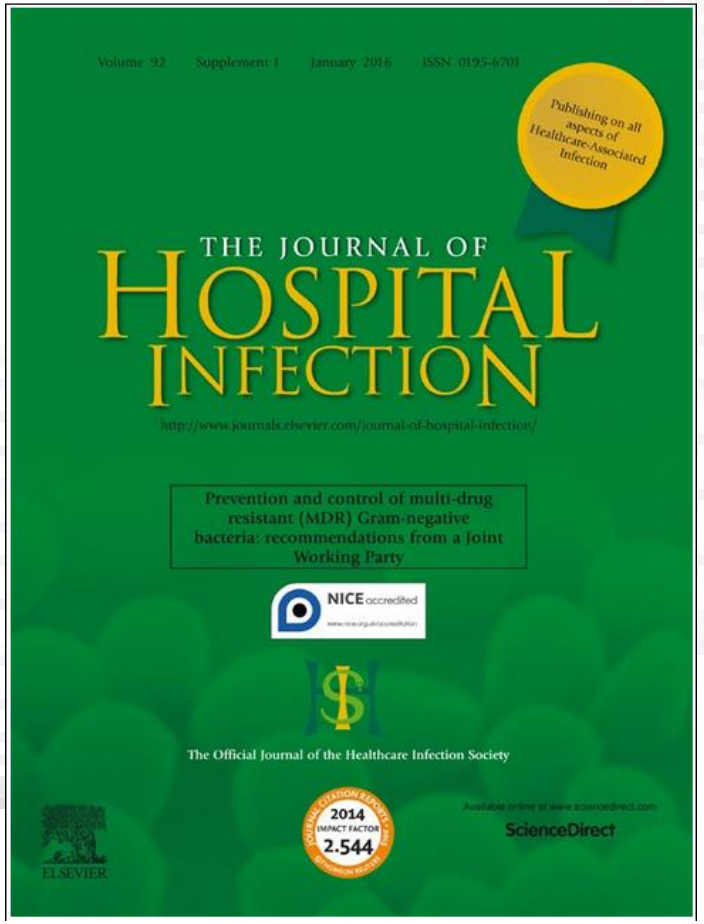
NICE – MDR Recommendations

- **Good Practice Recommendation** to not discard patient wash-water, body fluids, secretions or exudates into hand-wash basins
- **Strong evidence** that a risk assessment should be made in accordance with the organisations' WSP, when levels of patient colonisation or infection rise, in order to determine if **POU filters should be installed or taps changed**



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Wilson, A. P. R. *et al*. JHI 2016. 92, Suppl 1, S1-S44

Clinical Risk Assessments

- Patient susceptibility
  - Age/ immunocompromised/ underlying diseases
- Patient (or equipment) contact with water
  - Invasive devices/nebuliser/wound cleansing/sensory bubble tubes/drinking/showering/dental (HTM 01-05)
- Disposal
  - Blood, body fluids/urine, wash water
  - Correct designation & use of wash handbasins/sinks/sluices
- Notification of infrequently used outlets
  - Holidays, storage areas, reburbishments

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Facility/ward/department: _____ Assessment completed by: _____

Date: _____ (Names/titles): _____

Brief description of activity, location or equipment: to determine the level of risk that *Pseudomonas aeruginosa* from the water use/supply poses to the patients in the unit

Description of the hazards	Persons affected by the work activity and how	Existing controls	Likelihood	Impact	Risk rating
Infection/colonisation with Pseudomonas aeruginosa from contaminated water	Susceptible patients within augmented care units **Note to reader**: This is an example risk assessment. The control measures outlined are not exhaustive but are for illustrative purposes only. Each healthcare provider will have its own risks and will need to carry out a risk assessment based on these risks (see paragraphs 6.23–6.26 in HTM 04-01 Part B for examples of other risks and further guidance).	USE OF WATER: For direct contact with patients, water of a known satisfactory quality is used: • water where testing has shown absence of P. aeruginosa; or • water supplied through a point-of-use (POU) filter; or • sterile water (for skin contact for babies in neonatal intensive care units). ENGINEERING ASSESSMENT OF WATER SYSTEMS: • Correct installation and commissioning of water systems in in line with HTM 04-01 is adhered to • Schematic drawings are available for water systems. FLUSHING: • Flushing of water outlets is carried out and documented. SAMPLING: • Plans for the sampling and microbiological testing of water are in place			(See risk scoring matrix on next page)

Risk scoring matrix

Risk scoring:	Use the grid below to achieve and overall score for the risk by measuring across for the impact and down for the likelihood.					
		IMPACT				
		1	2	3	4	5
LIKELIHOOD	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Key	Green Low	Amber Medium	Red High

The resulting **action plan** should include:

- Sources of information/persons consulted
- Further action if necessary to control the risk
- Person/s responsible for coordinating implementation of the action.
- Recommended timescales
- Date completed
- Revised risk rating

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Treatment and Control Methods

Control measures should be designed to minimise biofilm growth:

- Reduce carbon from organic sources
- Maintain disinfectant residuals
- Restrict residence time of water in distribution systems

Control Measures

Physical

- Temperature
- Flushing
- Materials
- Ultraviolet
- Tap design
- Cleaning/scale removal
- Filtration

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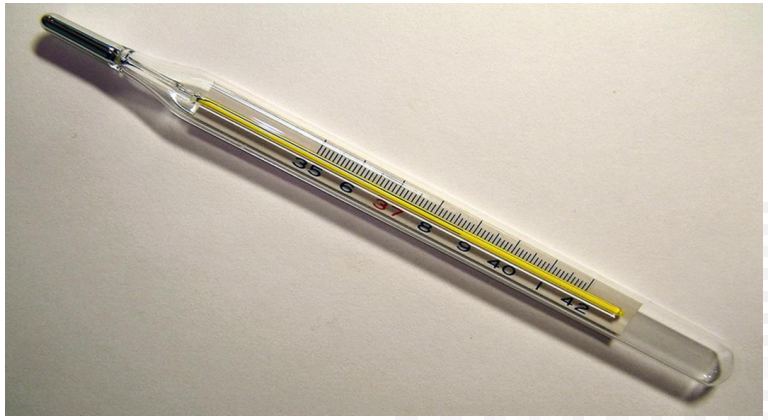
Never Events

- Serious, largely preventable patient safety incidents
- Implement preventive measures (full body immersion)
- Vulnerable patients
  - children and young
  - older people
  - Disabled
  - Sensory loss

http://www.hse.gov.uk/pubns/priced/hsg274part2.pdf

Scalding



- 50 °C – scalding risk small
  - increases rapidly with higher temperatures & exposure times
- Where significant scalding risk is identified consider:
  - using TMVs on baths and showers
  - Place as close to the POU as possible
  - Ensure correct function of TMVs

http://www.hse.gov.uk/pubns/priced/hsg274part2.pdf

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Flushing

RA should define frequency of inspection & monitoring depending on:

- Type of use
- Patient susceptibility
- Water quality
- Prior history

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/524882/DH_HTM_0401_PART_B_acc.pdf

Flushing

Service	Action to take	Frequency (see paragraph 7.53)
Infrequently used outlets	Consideration should be given to removing infrequently used showers, taps and any associated equipment that uses water. If removed, any redundant supply pipework should be cut back as far as possible to a common supply (e.g. to the recirculating pipework or the pipework supplying a more frequently used upstream fitting) but preferably by removing the feeding 'T' Infrequently used equipment within a water system (i.e. not used for a period equal to or greater than seven days) should be included on the flushing regime Flush the outlets until the temperature at the outlet stabilises and is comparable to supply water and purge to drain Regularly use the outlets to minimise the risk from microbial growth in the peripheral parts of the water system, sustain and log this procedure once started	Weekly, or as indicated by the risk assessment

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Control Measures

Chemical

- Chlorination
- Chlorine Dioxide (ClO_2)
- Monochloramine
- Copper-silver ionisation (Cu-Ag)
- (Silver) Hydrogen peroxide
- Titanium advanced oxidation process (AOP)

Image courtesy of Menchi

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Chemical Control

- Components can degrade due to prolonged exposure to powerful oxidising agents
- Stress may not kill (VBNC)
- Killing is not cleaning, so nutrient may remain
- Old systems will contain degraded material i.e. source of nutrient

Operational Limits

Define limits for acceptable performance e.g.

- Time
- Temperature
- Dose
- pH
- Water hardness

Image courtesy of S Sepp

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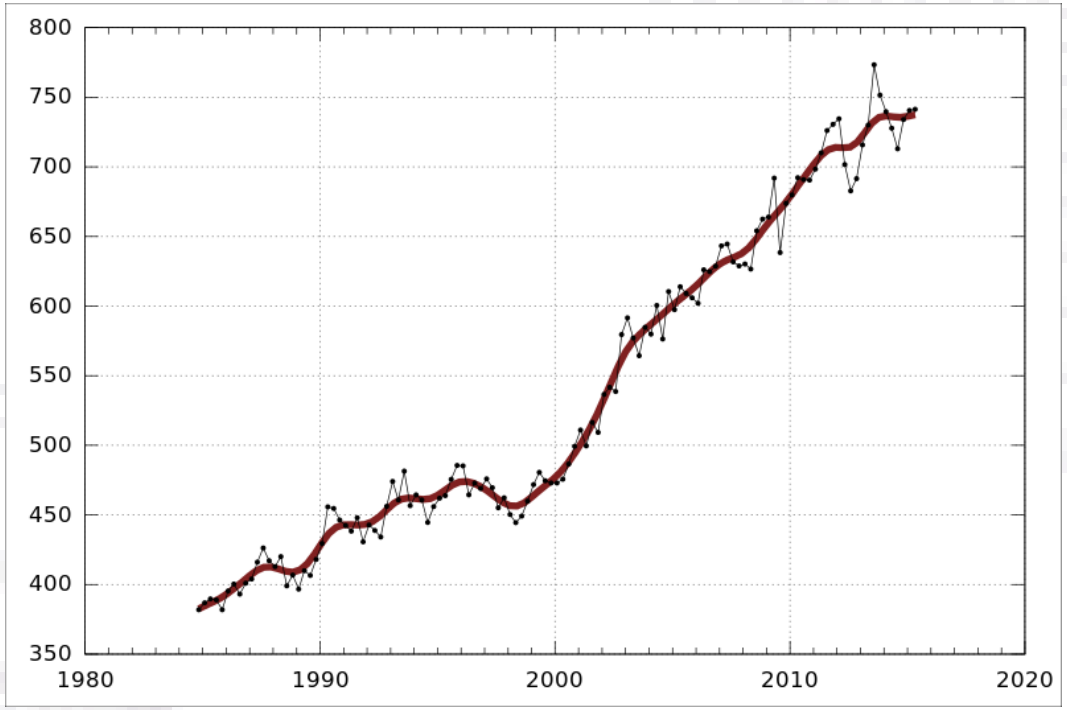
Monitoring

Define ways and means for assessing control measures performance e.g.

- Paper records
- Electronic log-books
- On-line monitoring
- Process-control
- Trend analysis



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Sampling Plan

- A sampling plan should be created according to risk assessment
- System diagrams indicating each numbered outlet to be sampled can be helpful

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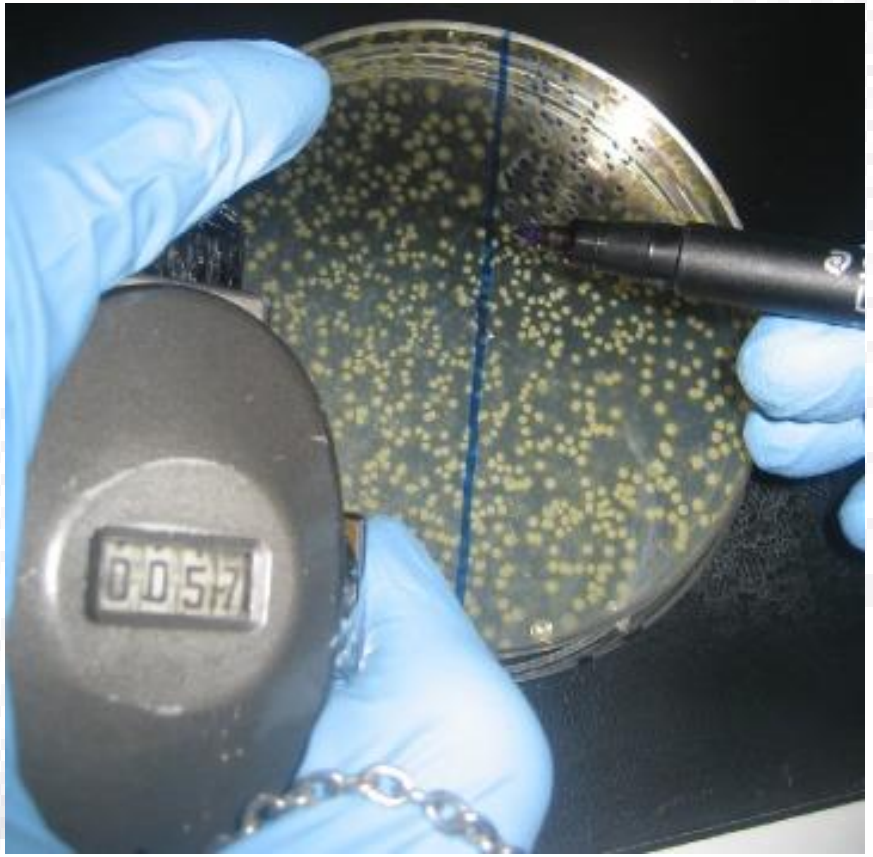
Microbiological Monitoring

- For taste or odour problems, total viable counts (TVCs) may be necessary
- No direct association with TVCs & presence of waterborne pathogens
- TVCs may be used to analyse trends
- Dip slides not acceptable on hot & cold water systems



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Legionella Monitoring

- Where there is doubt about efficacy of controls

or

- Where recommended temperatures, disinfectant concentrations or other precautions are not consistently achieved
- WSG should use RA's to determine when & where to test

Corrective Actions

Establish actions needed to bring the system back under control:

- Prioritisation
- Safety
- Cost
- Timescale

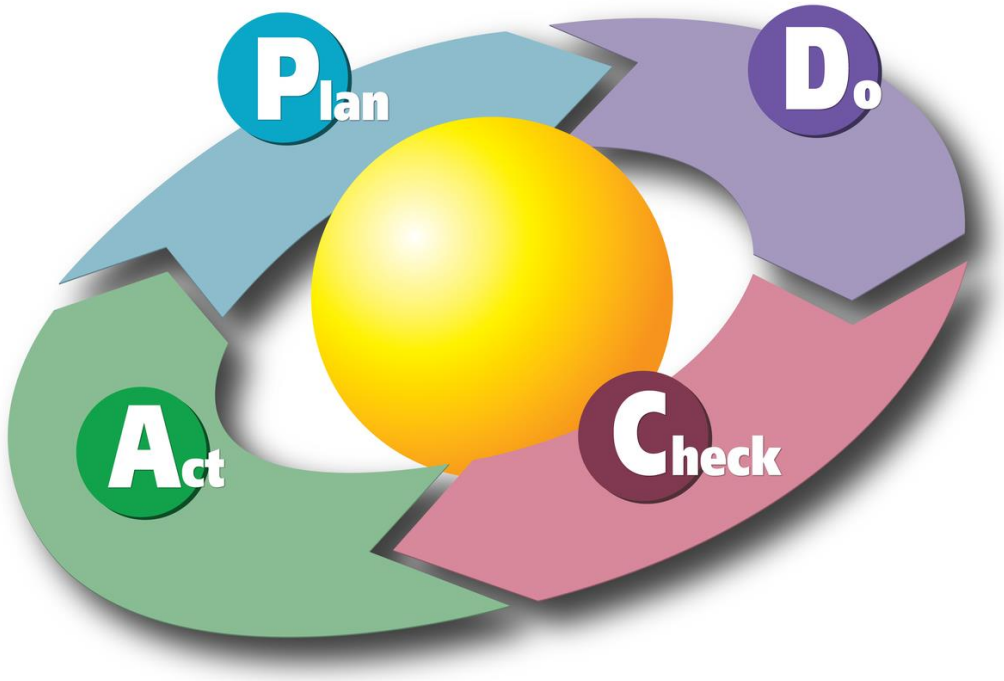

Diagram by Karn G. Bulsuk http://www.bulsuk.com

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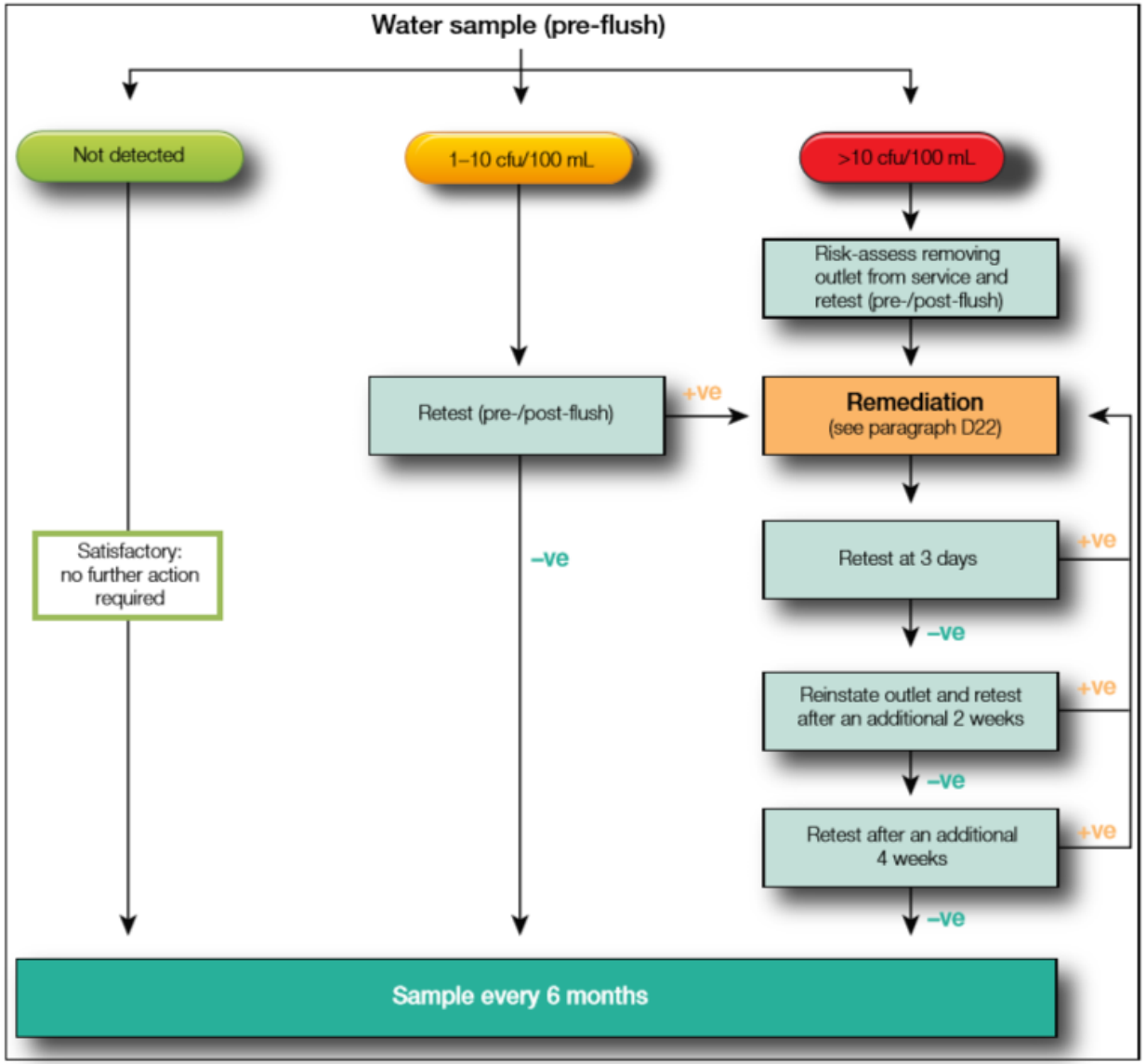
P. aeruginosa Monitoring



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Record Keeping

Regularly review the adequacy of the Water Safety Plan, controls and monitoring:

- Living document
- Monitoring data
- Risk assessments
- Personnel changes

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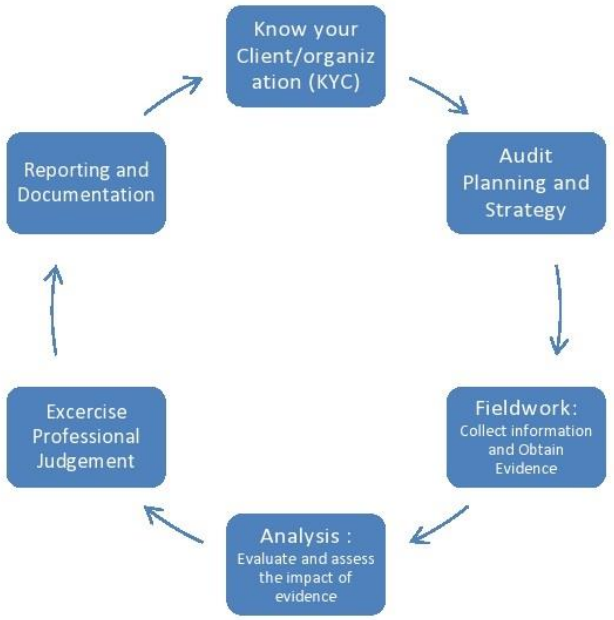
Validation Verification & Audit

Determine whether the Water Safety Plan is in compliance with the stated objectives, but also consider:

- Equipment manufacturers data
- Local regulatory approvals (WRAS etc)
- On-site performance
- Peer-reviewed evidence



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Summary

- Keep your hot water hot
- Keep your cold water cold
- Keep your water clean
- Keep your water moving
- Keep communicating through the WSG

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