

Australian-first application of stabilised hydrogen peroxide to eradicate legionella from a hospital problematic warm water system



ACIPC International Conference

Hotel Grand Chancellor, Hobart

November 19, 2025

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Presentation Overview



- ▶ Introduction & Context (Nicola)
- ▶ Case Study Methodology (Steve)
- ▶ Results & Outcomes (Steve)
- ▶ Conclusions (Nicola & Steve)

Declaration and Acknowledgements



ACIPPC

Australasian College
for Infection Prevention and Control

I have no conflicts of interest

Acknowledgements:

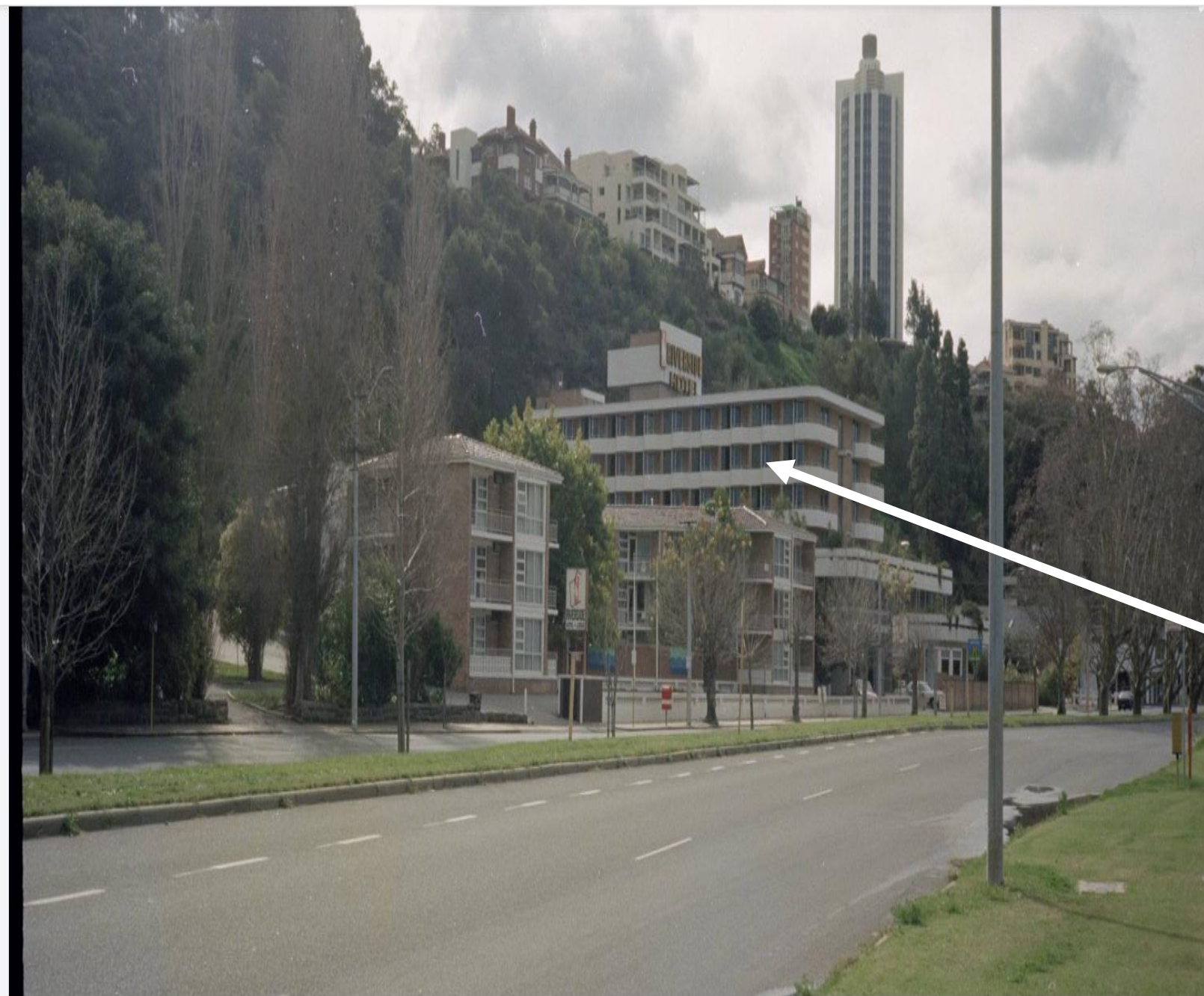
I begin today by acknowledging the Traditional Custodians of the land on which we meet today and pay my respects to their Elders past, present and emerging.

I extend that respect to Aboriginal and Torres Strait Islander peoples here today.

I would also like to acknowledge, Healthscope Hospitals



The Hospital Site 1970



The Riverside Lodge Hotel Motel in Perth 1970.

Motel was demolished and the Mount Hospital was built opening in 1986.

Part of the hotel remained, converted to doctors consulting rooms.





Original Hotel



Legionella and the hospital



Legionella frequently presents a notable challenge in water management

- A gram-negative bacteria
- Lives in both water and soil
- *L. pneumophila* from water sources
- *L. longbeachae* is found in soil and potting mix
- Legionella pneumophila bacteria are aquatic organisms, naturally found in most water environments
- Ideal temp for growth is 20° - 45° C
- Temps above 60° C generally kill Legionella
- Legionella feed on organic material such as algae and amoebae in the water



Ideal environment for the growth of Legionella

Old building equals old piping !

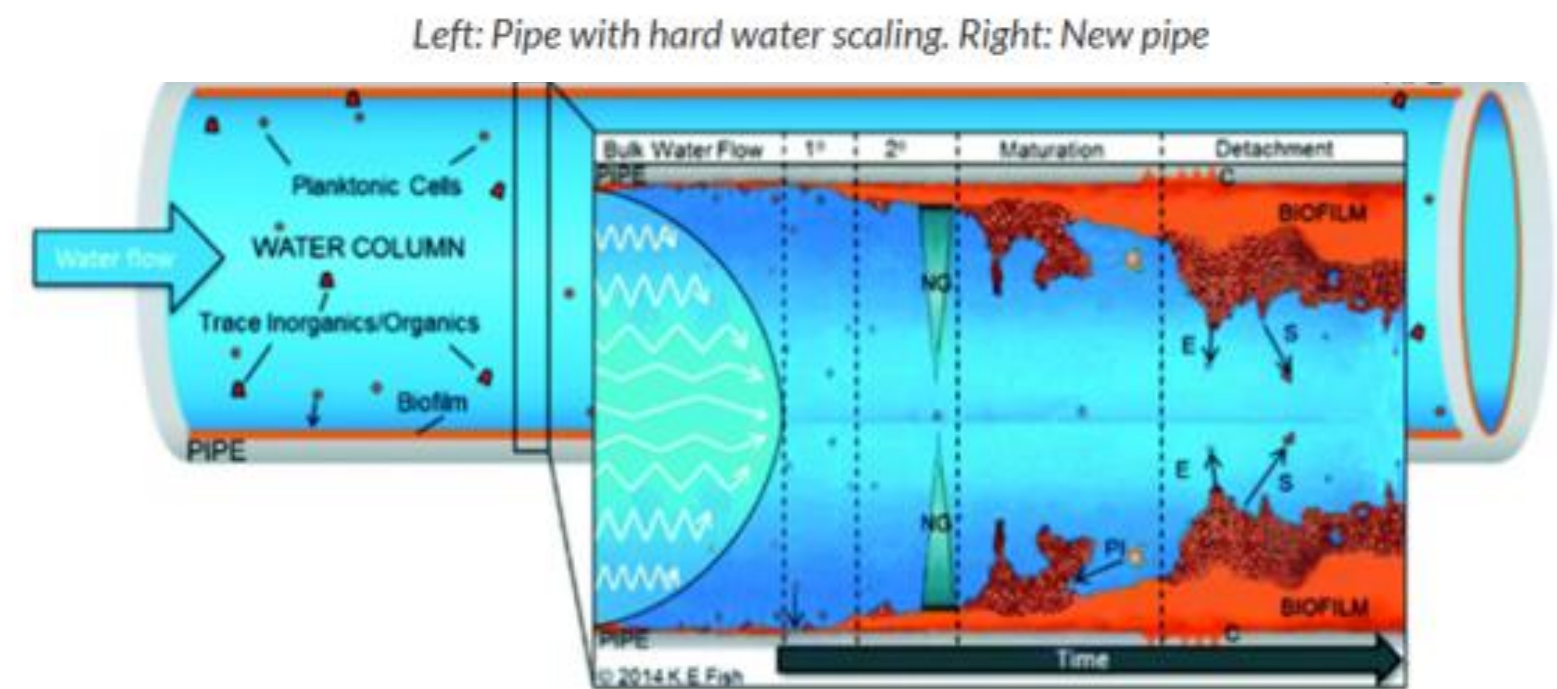
The building had alterations over many years leading to dead legs in the plumbing pipes.

Water stagnates in these areas, loss of disinfectant residual and Legionella proliferate.

Pipes become corroded over time and with scale formation creating ideal areas for the formation of biofilms filled with both amoebae and Legionella.

Scale can increase the growth of Legionella by 600%.

Legionella breaking out of the biofilms and free floating in the water is the cause for concern.



An example of pipe with biofilm and Legionella colonies



Legionella and risks

Exposure risks

- Inhaled as an aerosol
- Ingested (water aspirated into the lungs) from showers or during nasogastric feeds
- Intubation
- Mechanical ventilation
- Basin taps
- Inhaled from cooling towers
- Humidifiers
- Ice machines
- Respiratory therapy equipment
- Fountains

Who is at risk

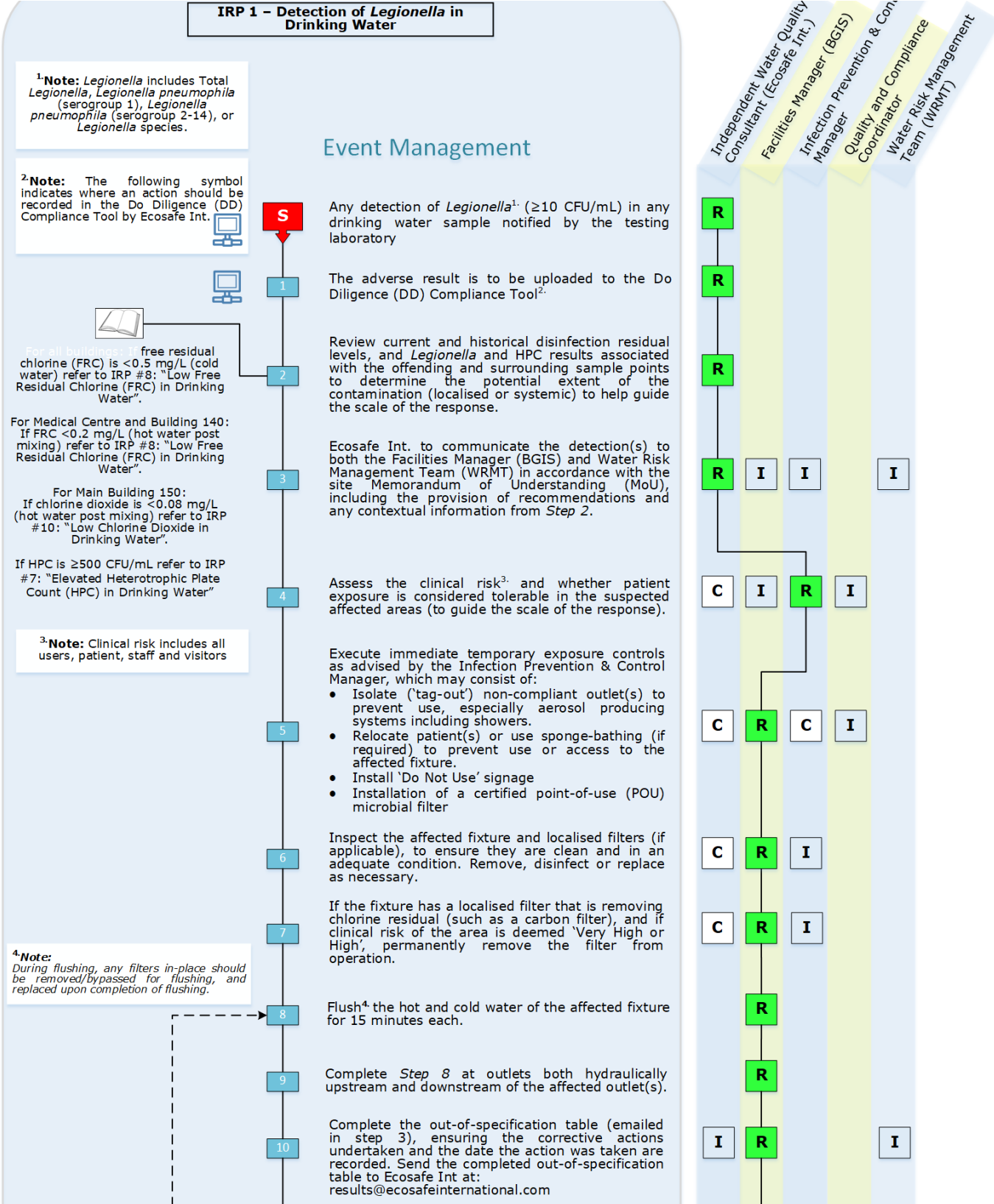
- New born babies (water birthing)
- Older people
- People with chronic obstructive pulmonary disease
- Diabetics
- Therapeutic immunosuppression
- Transplant immunosuppression
- Diseases that result in immunodeficiency (e.g. HIV/AIDS)
- People undergoing chemotherapy.



Management of water in the hospital

Hospitals require a **Water management team**

- IPC staff on site working with the Ecosafe team
- Have water quality Incident Response Protocols to manage situations when water results are out of suitable range.



2022 Legionella in Perth

 **The West Australian**

HEARTBREAK | Aussie crashes out on brink of Olympic history 202

Health | Mark McGowan | Politics | Public Health | State Politics

EXCLUSIVE

Another Legionella death revealed in Sir Charles Gairdner Hospital email exchange

 **Briana Fiore** | The West Australian
Fri, 11 February 2022 9:14PM | [Comments](#) |  



From: MMRIS, Ministerial and PQs
Sent: Monday, 16 May 2022 7:07 AM
To: Zagari, Janet
Cc: Lee, Lucy
Subject: FW: CBN - SCGH Legionella Death - April 2022
Attachments: CBN - SCGH Legionella Death - April 2022.d
Importance: High

Good Morning Janet & [redacted]
Please see below query from the MH Office:
I note the m GSD Room 3 has now been closed. Is this or any, or were any other patients staying in this m at any time who could have been exposed?

From: Bennett, Nicole
Sent: Thursday, 9 December 2021 7:00 AM
To: Marshall, Theresa
Cc: SCGOPHICU, Office of the ED, MMRIS, Office of the CE, Almadra, Hill
Subject: CHANGE TO APPROACH -due 10am today - MMRIS WACHS Legionella Patient August 2020 VLO IDGD

Morning Theresa
Change to the approach of this document to provide the chronology of events.
Tony has thought that it better that we provide a chronology of events on this case and refer to the other briefings that were submitted. This removes the need for detailing the case itself and focuses on the process.

 At least one other patient has died with legionnaires' disease after being in a contaminated ward, in addition to the death authorities tried to cover up last year, The West Australian can reveal. Credit: Supplied

The West Australian

Health | WA News
EXCLUSIVE

Perth's Mount Hospital finishes water system flush after legionella alert, confirms no patient infections

 **Caitlyn Rintoul** | The West Australian
Thu, 27 October 2022 2:36PM |  



 Male nurse pushing stretcher gurney bed in hospital corridor with male & female doctors & nurses & senior female patient in a wheelchair
Credit: Spotmatik/spotmatikphoto - stock.adobe.com

 [Perth's Mount Hospital has confirmed a full water system flush](#) has been completed, and no legionella bacterial infections reported, after its drinking water was contaminated at the weekend.



Action taken at the Mount Hospital

- Followed the Risk management plan
- Monitoring detected potential systemic colonisation of Legionella in the main clinical building warm water system (no linked HAIs)
- Immediate intervention with pasteurisation and flushing brought the system back into control
- Healthscope proactively provided a media statement
- Chlorinator installed on the warm water system to provide proactive control on microbial growth

Legionella situation was managed.

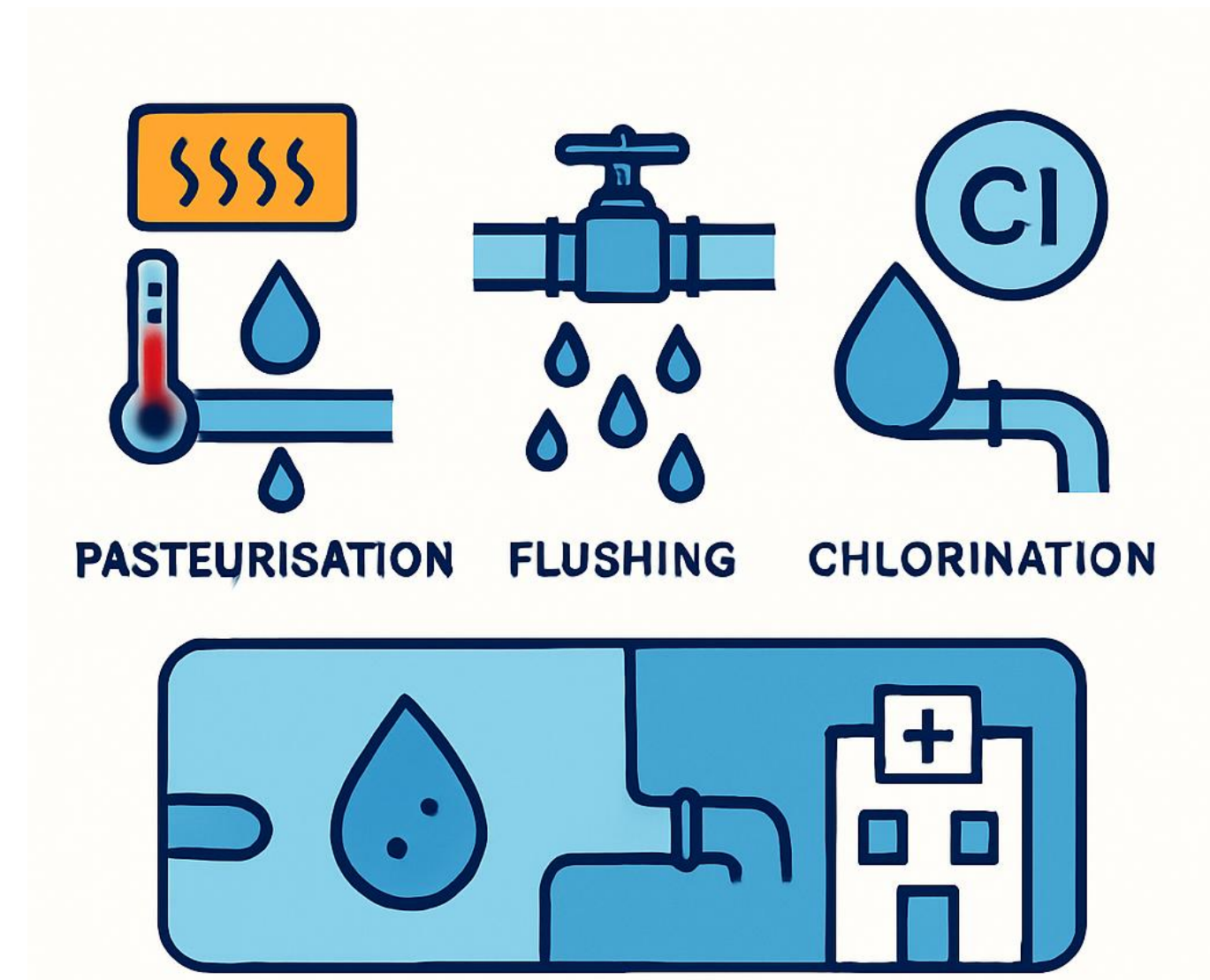


2022- 2024

- The Hospital had a new chlorine dioxide dosing system installed on the warm water system – consistently all clear results
- Doctor consulting rooms, now with piping close to 50 years old with dead legs in the plumbing and with biofilm formation was getting positive water results even though disinfected with a chlorinator
- Legionella repeatedly detected in some outlets of the warm water system (localised to outlets, not systemic colonisation)
- Management by the onsite team was to flush daily for 10 minutes to bring the chlorine to the positive site/tap with the intent to have the chlorine disinfect the site
- Sites in the doctors rooms were still coming back positive
- The Chlorinator was dialled up to increase the level of chlorine in the water
- Aged copper pipework system, prone to leaks, metals into the water
- Engineering advice to not have chlorine above 1 mg/L in the warm water system
- Something else needed to be done to help this situation

Remediation Options

- Attempted flushing – limited success
- Pasteurisation – system capability and thermal loss through system unable to reach effective temperatures
- Spare chlorinator installed to directly dose into the warm water system
 - Some progress made, but unable to retain residual on longer off-takes
- **Stabilised hydrogen peroxide (SHP)** proposed to conduct a trial to remediate the system
- SHP has been shown to be effective water disinfectant internationally, “SureClear” is a patented WA-based derivation – at the time not yet used in a healthcare setting

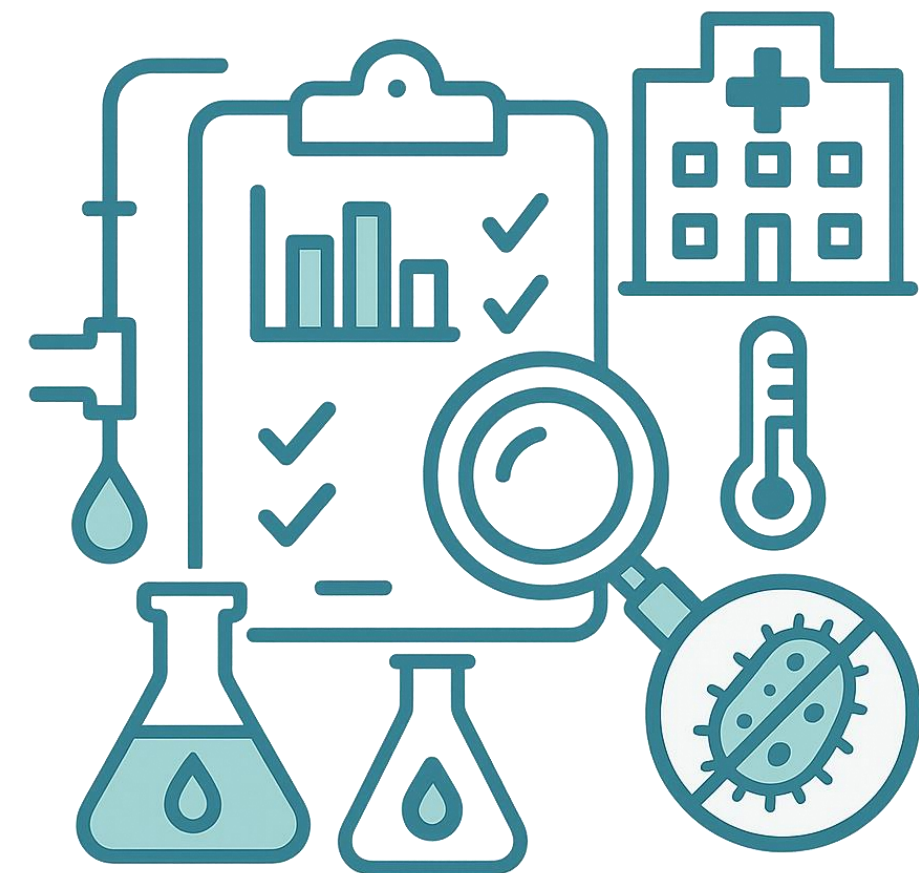


Trial Objectives

- Objective assessment of a new product to market – “SureClear” stabilised hydrogen peroxide
- Has obtained WA Department of Health approval for use on drinking water systems

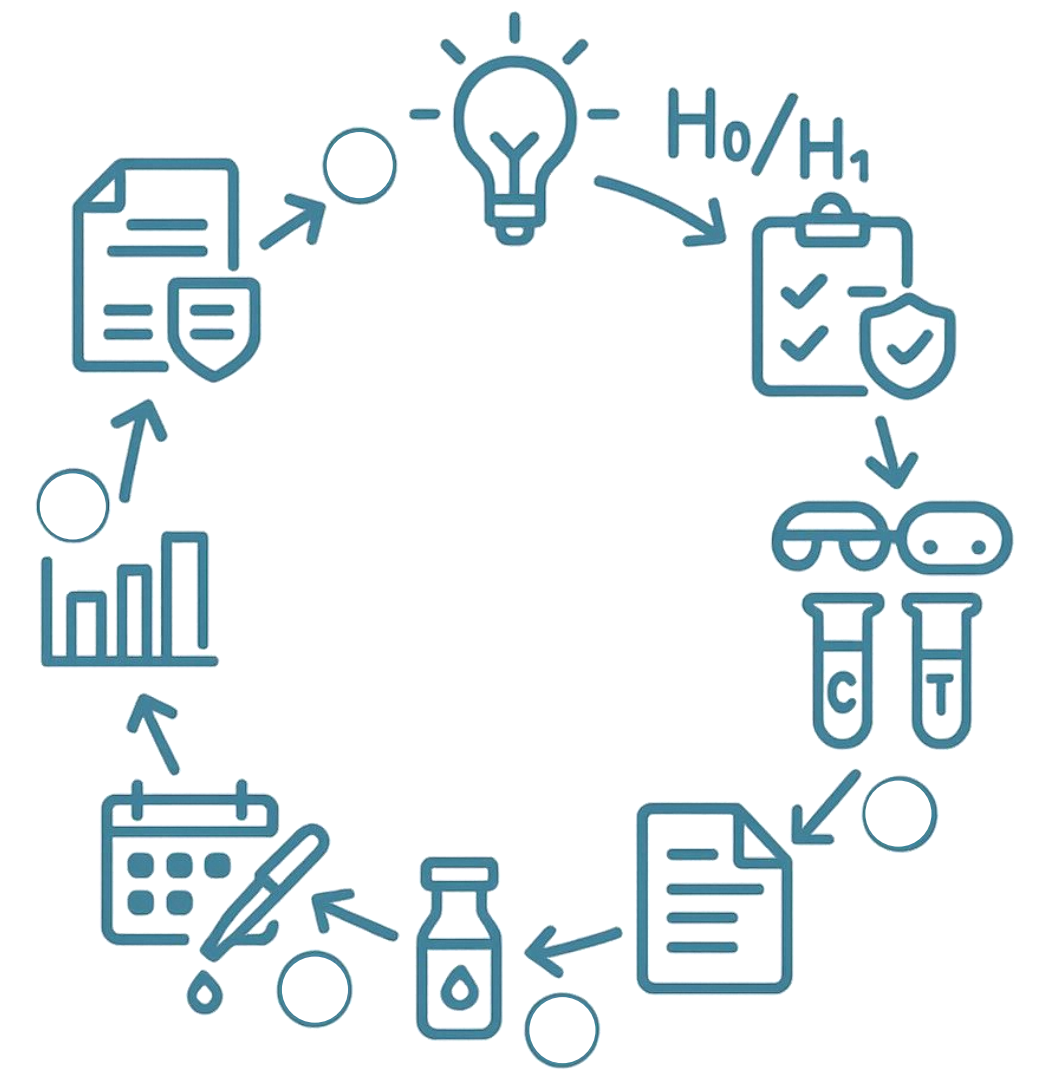
Trial Objectives:

1. Assess the remediation performance of the product
2. Assess the impact on assets and infrastructure
3. Determine impact of control variables –predominantly concentration and flushing duration/frequency
4. Determine the effectiveness of removing and maintaining no/low biofilm to reduce the chance of growing opportunistic premise plumbing pathogens (OPPPs) in the water system



Trial Methodology

- Sampling plan developed (in accordance with AS 5667.5)
- Sampling method – combination of “as it is delivered” and “flushed” protocols
 - First method representative of local pipework, excluding the aerator
- Microbial testing – Legionella, HPC 36 degrees
- Chemical testing – Total Silver, Iron, Copper, Antimony, Cadmium, Chromium, Lead, Nickel and Zinc. TOC
- Field testing: Free Chlorine, Hydrogen Peroxide, Temperature, Turbidity
- On-line peroxide analyser
- All laboratory testing NATA-accredited
- Going for an initial “shock dose” and flushing program to minimise the exposure time of elevated microbial counts



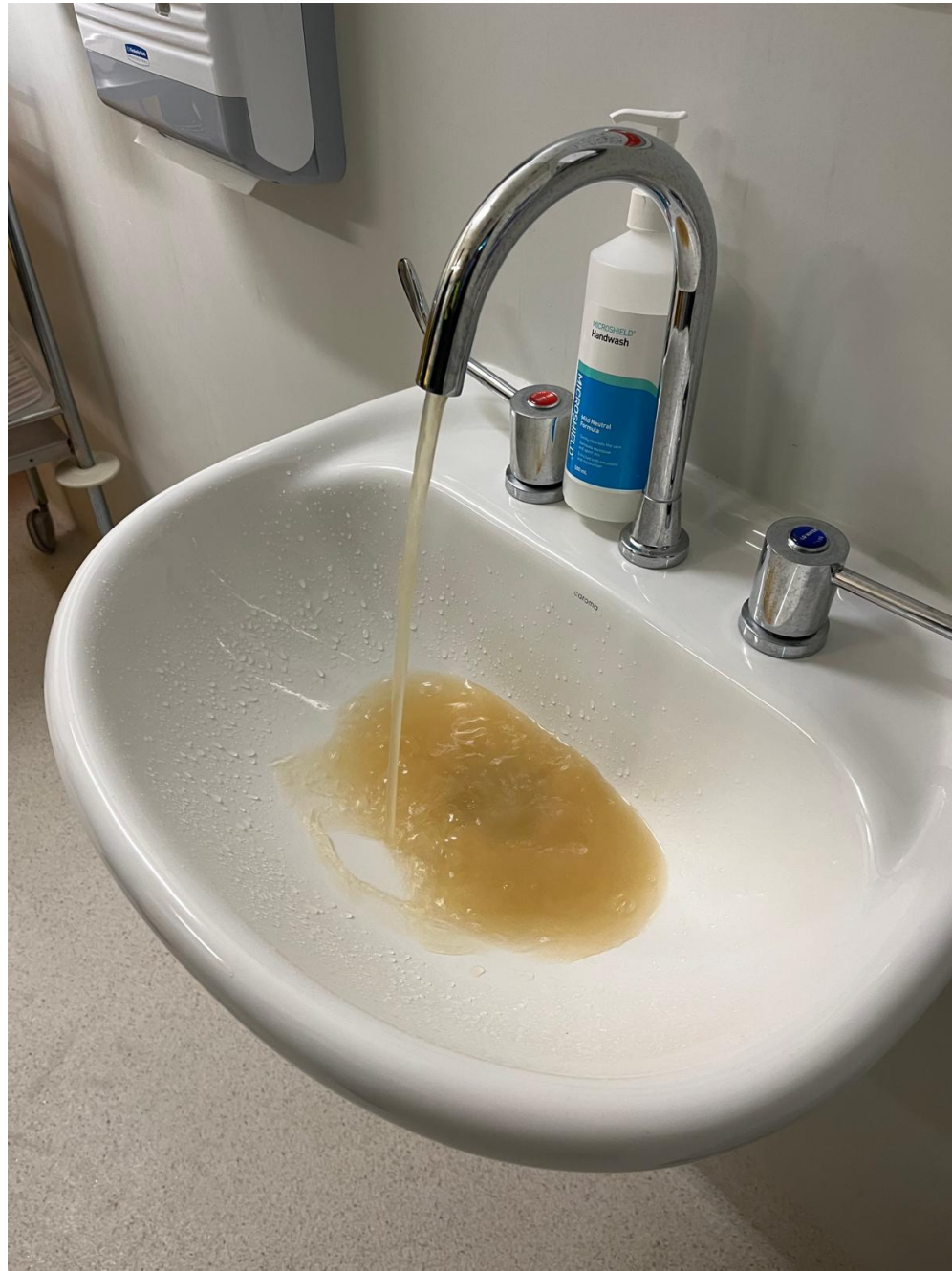
SHP Dosing & Monitoring



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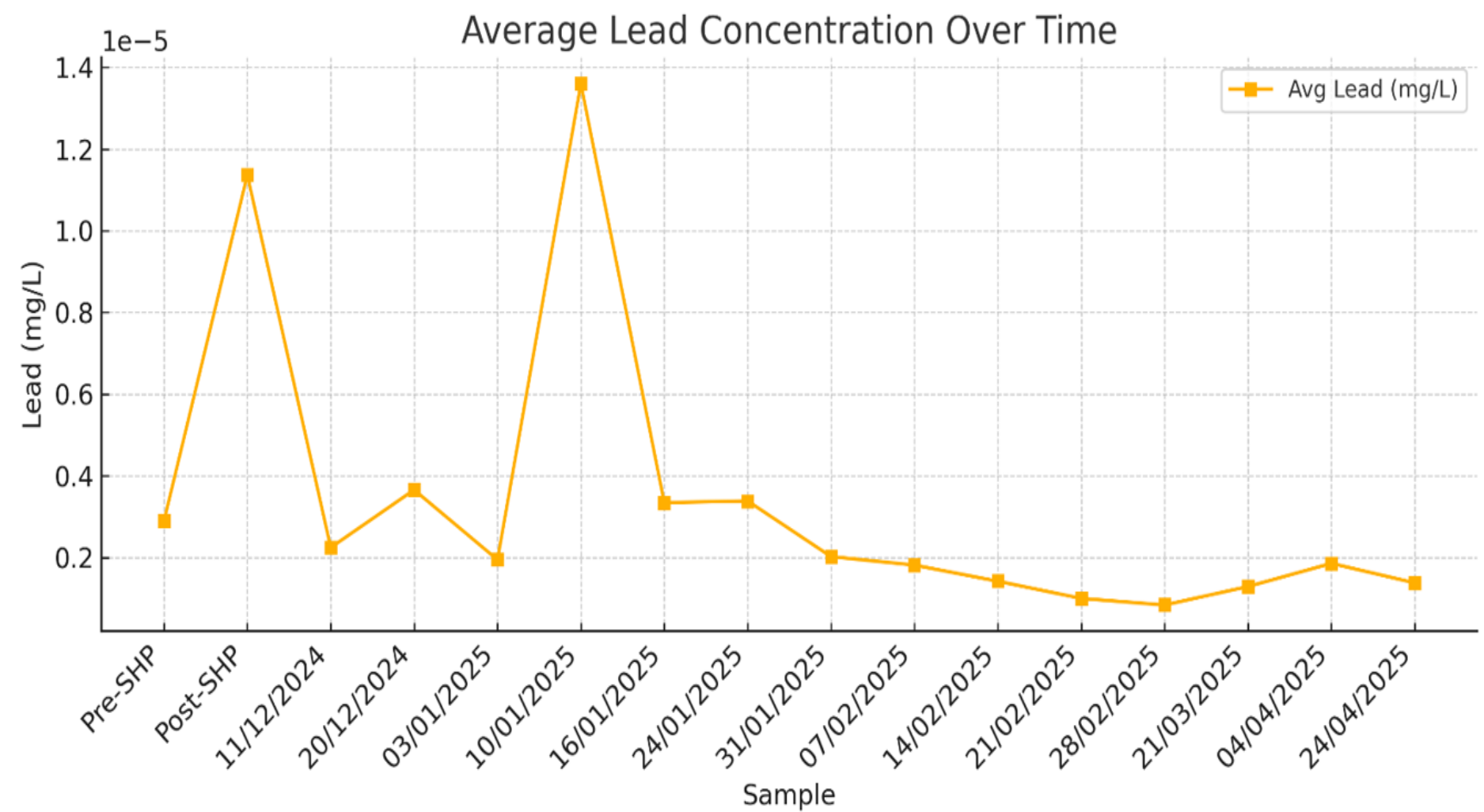
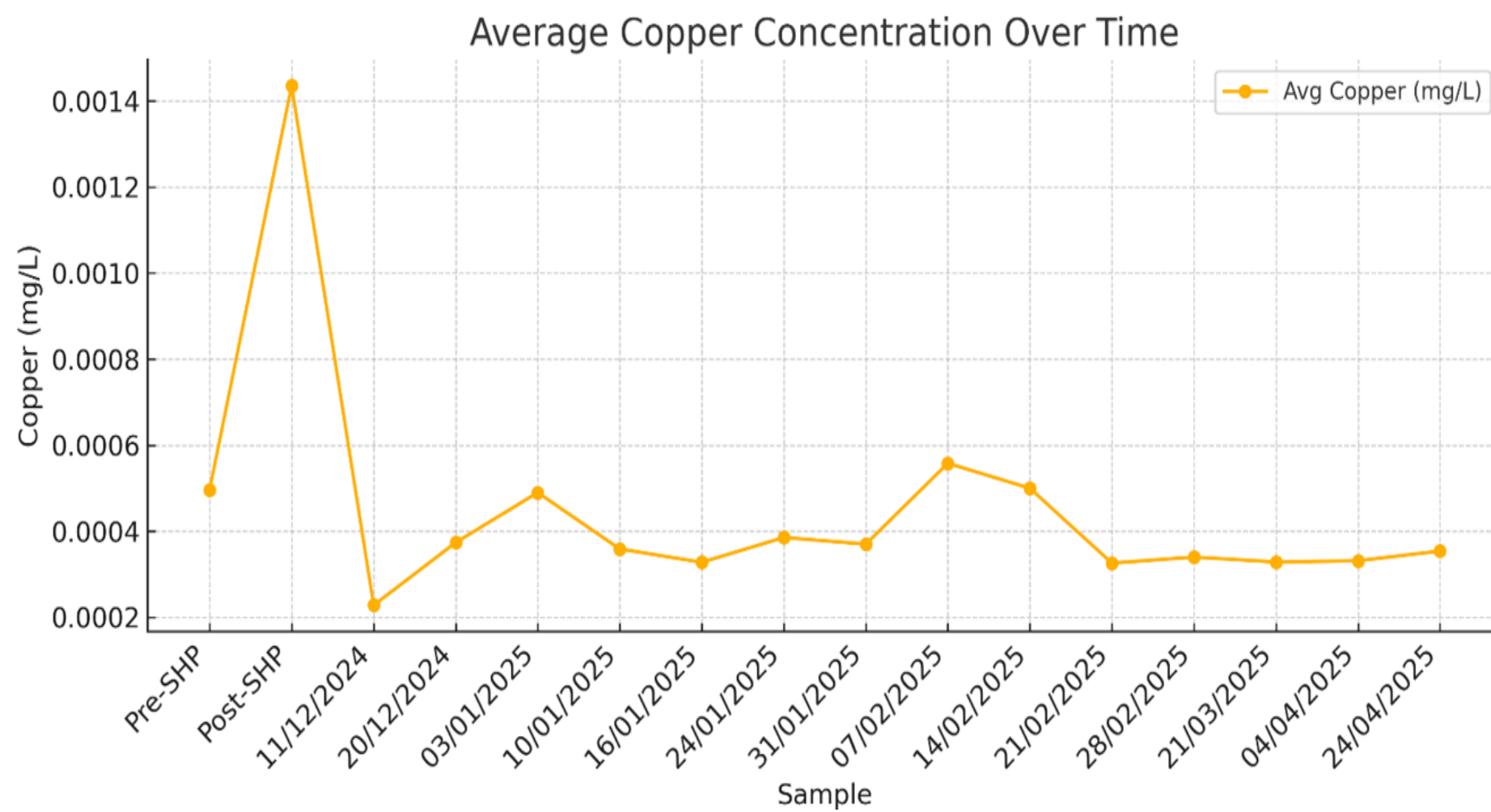
Trial Results



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Trial Results - Metals

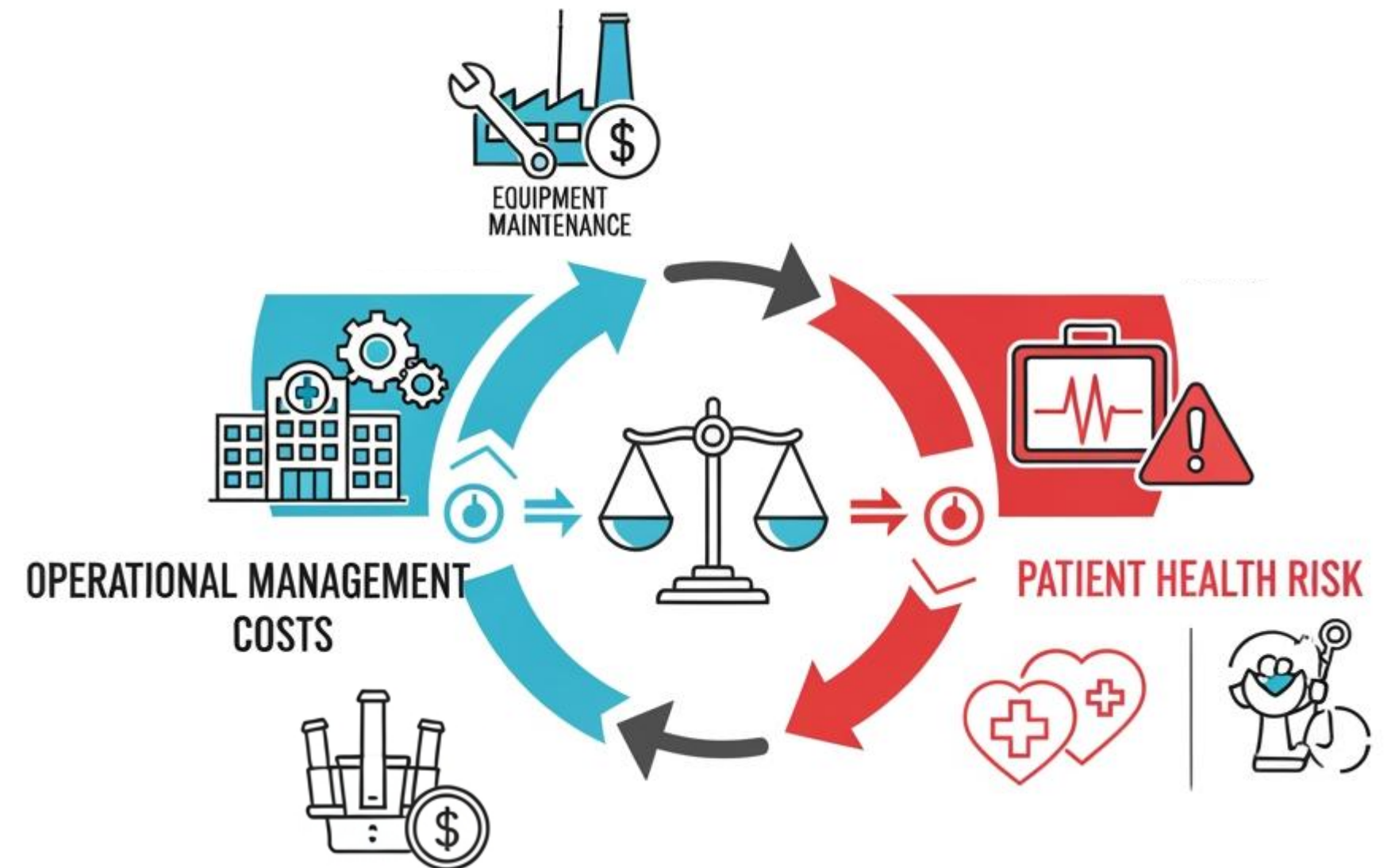


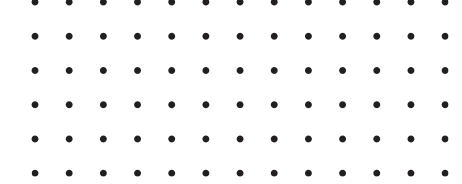
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Conclusions

- ✓ Stabilised Hydrogen Peroxide is a viable option for OPPP management in healthcare facilities.
- ✓ Reduced aesthetic impact (compared to chlorine) can improve patient and staff confidence in the water quality.
- ✓ Continual assessment of dosing and flushing frequency vs microbial performance to optimise patient risk, operational costs and asset management.





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SCAN ME



ANY QUESTIONS?

