Clean Hands, Clear Water: Hand Rubbing for an Eco-Friendly Scrub

Stephanie Rees
Anaesthetic Trainee
BCUHB

What is hand scrubbing?

The process of reducing the number of microorganisms on the hands and forearms before performing sterile procedures to minimise the risk of surgical site infections.

This works well in theatres…

Theatres:

Outside of theatres:

ICU, ED, Anaesthetic rooms, patient rooms

This works well in theatres…

Their use contravenes IPC guidelines:

- ‘The scrubbing area should be large enough to allow free movement of people […] without risk of contamination from each other or the surrounding fittings’
- ‘The height of the sink and furniture should facilitate hand and arm washing and prevent splashing of clothes. The design and drainage should ensure that the floor does not become wet during washing procedures
- ‘Sensor taps must allow a sufficient run-on time to complete the full hand antisepsis protocol.’

Outside of theatres:

ICU, ED, Anaesthetic rooms, patient rooms

Traditional hand scrubs are an environmental nightmare

- Traditional surgical scrubbing at Glan Clwyd consumes over 1 million liters of clean water annually.
- Chlorhexidine-based products are not removed by water treatment.
- Contaminants are released into the sea, where they are toxic to aquatic life and primary producers.

Traditional hand scrubs are an environmental nightmare

10.6 Hazardous decomposition products

Decomposition products may include the following materials:
Carbon oxides
nitrogen oxides (NOx)
Sulphur oxides
Oxides of phosphorus

12.1 Ecotoxicity

Environmental Effects : Very toxic to aquatic life.

96 h LC50 Fish : 2.6 mg/l

methanol
96 h LC50: 15,400 mg/l

glycerin
96 h LC50 Fish : 855 mg/l

ethanol
96 h LC50 Fish : 11,000 mg/l

Components

Toxicity to daphnia and other aquatic invertebrates : methanol
48 h EC50: > 10,000 mg/l

Chlorhexidine gluconate
48 h EC50: 0.06 mg/l

Components

Toxicity to algae : methanol
72 h EC50: 22,000 mg/l

The problem- Human and operational cost

Traditional scrubs are harsh; dermatitis affects 27.8% to 40% of healthcare workers, causing discomfort and potential occupational health referrals.

A single traditional scrub can use up to **20 litres** of water.

The Solution – Alcohol-Based Hand Rubs (ABHRs)

- ABHRs maintain antimicrobial action for up to 6 hours under gloves, whereas microbial levels rise steadily after chlorhexidine use.
- Recommended by the WHO, Royal College of Physicians, and Royal College of Surgeons (Green Theatre Checklist).
- Sterillium costs £3.00 per bottle vs. £3.41 for traditional Hydrex. Roughly equal usage shown.

Aims & Objectives

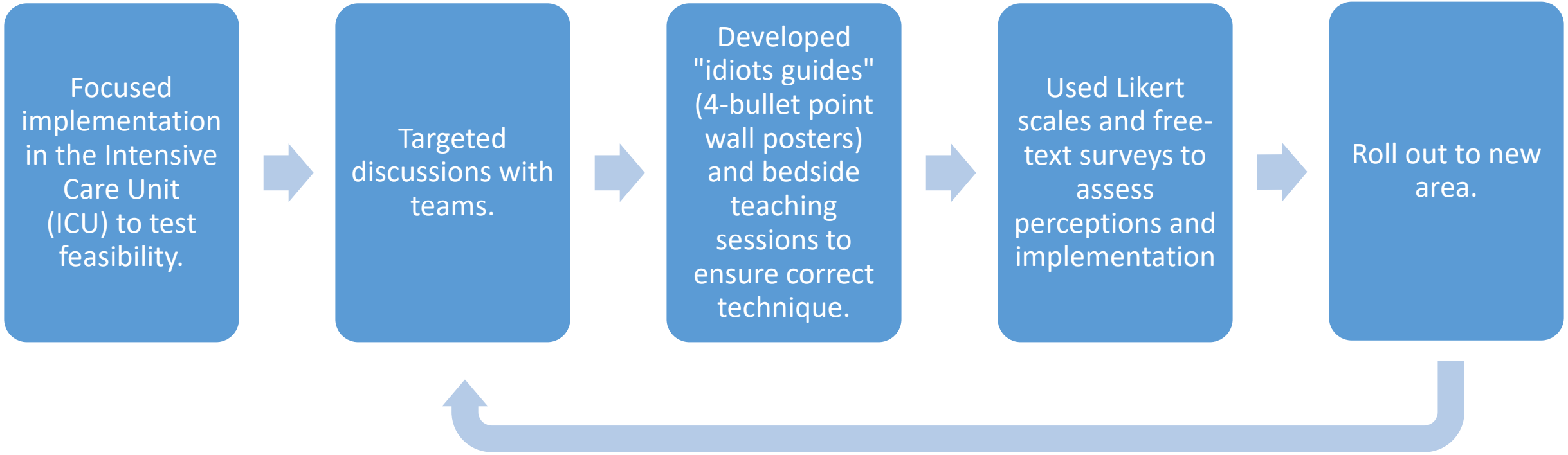
Primary Aim: Implement the transition to ABHRs for all sterile procedures at Glan Clwyd Hospital within 12 months.

Integrate procedural training into hospital induction for all rotating staff.

Establish baseline and follow-up compliance audits at 6 months.

Align BCUHB with NHS sustainability targets and reduce the hospital's ecological footprint.

Approach


Focused implementation in the Intensive Care Unit (ICU) to test feasibility.
Targeted discussions with teams.
Developed "idiots guides" (4-bullet point wall posters) and bedside teaching sessions to ensure correct technique.
Used Likert scales and free-text surveys to assess perceptions and implementation
Roll out to new area.

Outcomes – Pilot Success

100% of pilot participants found ABHRs easy to use.

93% were satisfied or very satisfied with the transition.

93% reported that ABHRs made it easier to adhere to hand hygiene protocols.

Users cited "easier and less mess" and noted that gloves are easier to put on as the alcohol dries completely.

Hurdles & Lessons Learned

- Cultural Resistance: Overcoming established scrubbing traditions, particularly in surgical departments, remains a challenge.
- Procurement Barriers: Identifying and securing the correct ABHR products on the NHS Wales Oracle system required significant coordination.
- Education Gap: Initial anxieties regarding efficacy were high; these were mitigated through evidence-based safety data and demonstrations.
- Logistical Delays: Implementation has been gradual due to the need for formal evaluation and user feedback at each stage.

Impact & Next Steps

Expansion plans are finalised for Radiology, Outpatient Surgery, and the Labour Ward.

Full transition for all main operating theatres is targeted for mid 2026.

Findings will be shared with the BCUHB Strategic Infection Prevention Group to scale the project to other North Wales sites.

Conclusion

Sustainability: ABHRs offer a rare "win-win" for environmental protection and clinical efficiency.

Efficiency: Faster asepsis (90 seconds vs 3 minutes) improves workflow in critical areas.

Staff Well-being: 85% of staff reported stable or improved skin health.

Clean hands don't have to mean wasted water.

Thank You

Stephanie Rees

stephanie.rees236aca@wales.nhs.uk