

“Rub don’t scrub” Step-by-step guide

RCS Green Theatre Checklist e-QIP

Reducing water consumption in hand decontamination

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Background

Climate change poses an unquantifiable global health threat, and yet if healthcare were a country, it would be the fifth largest polluter in the world.¹ Healthcare systems need to make fast and effective changes to reduce their carbon footprint and improve the health and wellbeing of patients and staff as a result.

Current guidance by the World Health Organization and NICE recommend a formal surgical scrub using chlorhexidine gluconate 4% or povidone-iodine 7.5% solutions and water for the first instance of scrubbing.^{2,3} The wash which involves three parts (pre-scrub, nail decontamination and second scrub) should be a 3-minute process. Thereafter, both organisations advise that hands can be decontaminated using alcohol-based hand rub (ABHR), unless visibly soiled.

Traditional hand washing has been estimated to use approximately 18-21 litres of water per scrub, per staff member!^{4,5} Alcohol based hand rub is a waterless method of hand decontamination with the same, if not better, antiseptic capabilities.⁶ Some hospitals benefit from intermittent flowing water systems, which can also save significant water use if programmed appropriately.⁷ The carbon footprint of 41-degree water from a gas-heated system is approximately 8.4kgCO₂e per m³.⁸ Therefore, switching to ABHR where appropriate could lead to significant water, energy and carbon savings.

We undervalue water as a resource; global water consumption is increasing by 1% each year,⁹ and if current consumption patterns of water continue, 2/3 of the world's population could be living in water-stressed countries by 2025.¹⁰

Evidence suggests surgeons tolerate ABHR better than traditional methods,^{11,12} and may be more adherent to hand decontamination protocols when using it.¹² There is no difference in surgical site infection with ABHR versus traditional scrubbing, and some studies even suggest a superiority with ABHR.^{12,13}

This simple project may be enough to inspire others and to get the ball rolling in the department, and anyone can do it!



Aims

To reduce water consumption in theatres, and demonstrate consequent carbon and cost savings.



Methods / Instructions

1. First, find out if this or similar project has been completed before in your department. If so, in what capacity (cost savings only, water savings, etc.)? What were the findings? What were the recommendations and have these been actioned? Can you pick it up where it was left?
2. Discuss the project with your educational supervisor and see if they can support or help you find a supervisor for this project. They may be able to link you with relevant people, including the department's sustainability lead (anaesthetic or surgical) or clinical governance lead, who may be of help or may want to be involved. It may also be useful to link in with your Trust's sustainability team who may support the project and help you find allies in the department and link you up with other relevant stakeholders.
3. Register the QIP with the hospital if needed (find out about your own Trust's policy).
4. What options are available for hand decontamination? ABHR, sinks (how is the sink operated – sensor, tap or pedal?).
5. **BASELINE AUDIT – how do people decontaminate their hands currently?**
 - a. Choose an appropriate sample (a spread of different lists and specialties, and those that do not have just 1 or 2 big cases for the day), 5 days might be a sufficient period to start with.
 - b. Calculate how much water is consumed. You can use the data collection spreadsheets provided in the toolkit or create your own. There are 2 templates provided: the 'Basic' template (first tab) calculates water use only, whereas the 'Advanced' template (second tab) will also give you a carbon and cost analysis. These correlate to slides in the presentation, with results linked to specific cells in the respective spreadsheet tab, so you will need to fill out appropriately and delete whichever slide you choose not to use.

BASIC – you can use figures published in the literature as a measure of water consumption (for example 1 hand wash = 18 litres).⁵

ADVANCED – measuring your own water expenditure will be more accurate as flow rates can substantially differ, and staff may use less water for subsequent scrubs as they tend to be faster.

Options for how to measure average water consumption per scrub:

 - i. Use a universal plug to plug off the sink and measure volume of water using dimensions to calculate the volume (you will need to measure depth each time) and convert to litres; or, collect water in a measuring bowl placed in the sink under the tap being used.
 - ii. Calculate the tap flowrate by measuring the time required to collect a set volume (eg filling a 1L jug, this may vary at different sinks so ensure you check a few different taps), and then time how long the taps are running for to determine volume of water used.



Methods / Instructions (Continued...)

- c. Using the template supplied, present and circulate baseline audit data – e.g., at governance meeting, theatres noticeboards, staff bulletin etc. It is helpful to provide yearly estimates, so that you can demonstrate effective savings in a more meaningful and impactful way (there is a section of the spreadsheet to do this).
 - d. At this stage it is essential to reach out and try to engage all relevant stakeholders by sharing your findings.
6. What **intervention** do you need to make? What are the current barriers?
- a. Education: staff don't realise they can use ABHR.
 - **Action point:** disseminate information through posters, emails, or mention at team briefing.
 - b. No available ABHR.
 - **Action point:** talk to theatre managers and request ABHR in theatres involved. These should be available in the stock rooms in theatres. You may need to hand-deliver them to theatres yourself in the beginning.
 - c. Sensor-controlled sinks.
 - **Action point:** talk to estates, can the sensors be adjusted to be on for the shortest possible time?
7. **Implement** change, ensure all theatre staff are informed. Put posters above sinks / instructions on how to decontaminate hands using ABHR if not already present.
8. **RE-AUDIT practices and calculate** triple-bottom line savings, and re-present data using the provided presentation template.



Stakeholders

All theatre staff: theatre nurses, scrub nurses, health-care assistants, consultant surgeons and anaesthetists, surgical and anaesthetic fellows and residents, operating department practitioners, medical and nursing students; as well as theatre managers, infection control and prevention department, procurement, estates, trust's green team.

Outcome measures

- ✔ **Water (in litres)**
- ✔ **Carbon equivalent** – 1 gallon (1000 litres) of flowing water at 41 degrees is estimated at 8.41 kgCO₂e⁸

Unfortunately, we do not at this moment have a CO₂ equivalent for the different antiseptic solutions or the ABHR gel, so estimates are conservative.
- ✔ **Financial cost** – 0.4p per litre of water⁸. Chlorhexidine 17p per scrub, iodine 30p per scrub, ABHR 20p per scrub⁵ (you can also approach your own procurement lead to find out exactly how much you pay for these items, and calculate cost based on how much is recommended for the product to be effective)
- ✔ **Optional:** staff opinions / satisfaction – you could design a survey / collect verbal feedback both before and after implementing the change.

Future work

Did this project go well? Did you find other interested members of the theatre team? Could you start a green theatres team and start tackling more of the GTC audits together?



References

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