

Simplifying the WHO protocol: Three steps versus six steps for performance of hand hygiene - a cluster randomized trial

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Introduction and Purpose

- Hand hygiene is one of the most important measures to prevent transmission of pathogens in healthcare settings.
- The technique for the use of hand rub outlined in the WHO guidelines consists of six steps to ensure entire coverage of the hands.¹
- If several areas of the hands are frequently missed when applying hand rub, this may potentially limit efficacy of hand hygiene performance and overall compliance of healthcare workers with all six steps is low.
- We previously demonstrated that a hand hygiene technique consisting of three steps fulfills the EN 1500 norm and is superior regarding reduction of the bacterial load on the hands of medical students as compared to the technique consisting in six steps.²
- We therefore aimed to compare compliance and reduction of the bacterial load on the hands of healthcare workers between the hand hygiene techniques consisting of three and six steps for use of hand rub.

Methods

- From October to November 2015, we performed a cluster-randomized trial at the University Hospital Basel, Switzerland.
- Twelve wards were randomly assigned to performance of hand hygiene using either the technique with three steps (intervention) or six steps (controls) for use of hand rub.

- The three steps consist in first, covering all surfaces of the hands (based on own judgement), second rotational rubbing of fingertips in the palm of the alternate hand, and third, rotational rubbing of both thumbs (**Figure 1**).
- Both techniques are performed for 30 seconds using three ml of hand rub.
- Each ward received hand hygiene tutorials prior to the start of the study and weekly thereafter.
- The primary endpoints were compliance with the assigned technique and the reduction of bacterial counts on the hands of healthcare workers.
- Compliance with hand hygiene indications was considered as secondary endpoint.
- The reduction of bacterial counts on the hands of healthcare workers was assessed following the method outlined by the European Norm (EN 1500) for testing hand hygiene products.

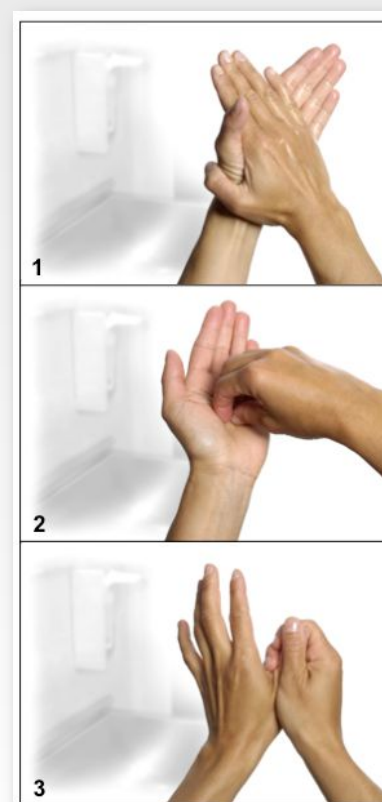


Figure 1: 3-step hand hygiene technique

Results

- Twelve wards were randomly assigned to both hand hygiene techniques (6 wards to the 3-step technique and 6 wards to the 6-step technique).
- Overall, 2674 hand hygiene observations were performed and compliance with hand hygiene indications was 71.3% (1906/2674).
- Compliance with hand hygiene indications differed between the wards assigned to the 3-step technique and the 6-step technique (76.8%, 1045/1360 and 65.5%, 861/1314, $p < 0.001$).
- Compliance with hand hygiene technique was 54.3% (567/1045) in wards assigned to the 3-step technique and 16.4% (141/861) in wards assigned to the 6-step technique – differing significantly ($p < 0.001$).
- Microbiological analyses revealed no significant differences in bacterial counts on the hands of healthcare workers prior and after use of hand rub between both hand rub techniques (**Figures 2 and 3**). Furthermore, the reduction factor of colony forming units did not differ between the two techniques (**Figure 4**).

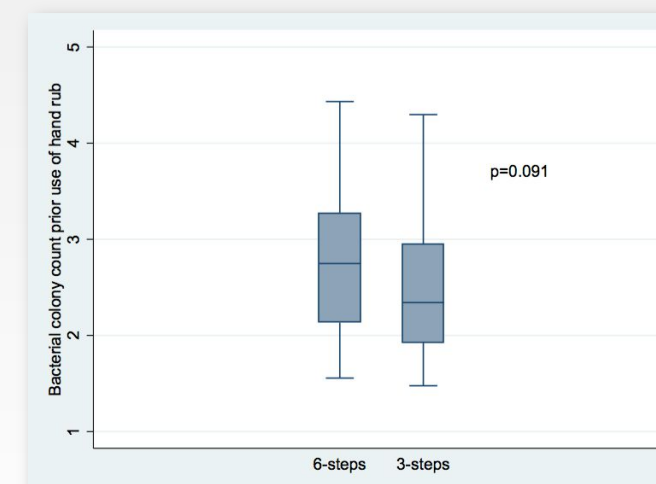


Figure 2: Differences in bacterial colony counts between both techniques prior use of hand rub

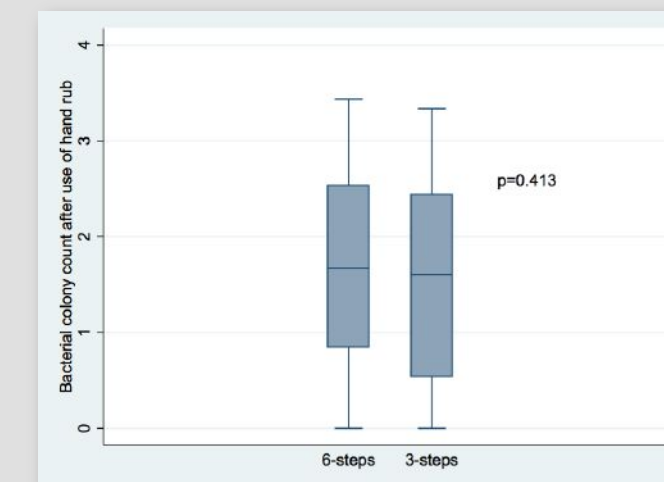


Figure 3: Differences in bacterial colony counts between both techniques after use of hand rub

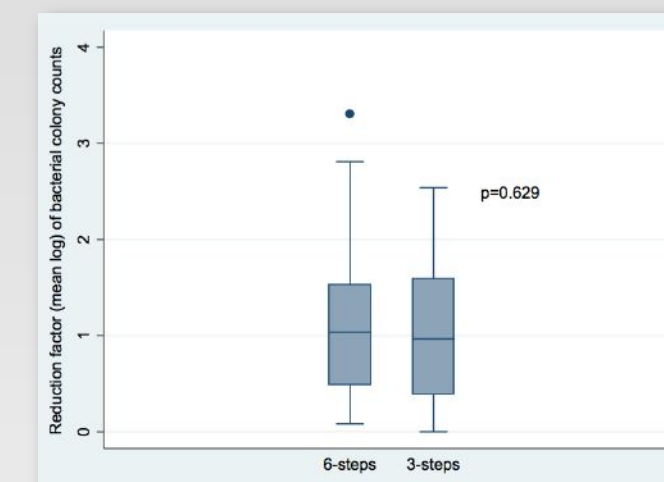


Figure 4: Differences in reduction factors between both techniques

Conclusions

- The simpler hand hygiene technique consisting of 3 steps resulted in higher compliance with both hand hygiene indications and technique as compared to the 6 steps in a clinical setting.
- As the results of the microbiological analyses exclude inferiority, the conventional 6-steps could be safely replaced by a simpler hand hygiene technique, resulting in higher overall compliance.

References

- World Health Organization: WHO guidelines on hand hygiene in health care. Geneva: WHO Press 2009
- Tschudin-Sutter S, Rotter ML, Frei R, Nogarath D, Strandén A, Widmer AF. Simplifying hand hygiene technique: three steps are as efficient as six – results from a randomized cross-over trial. European Congress of Clinical Microbiology and Infectious Diseases, Copenhagen, Denmark, April 2015.