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MDRO and disinfection

Revisiting the WHO “How to handrub” standard technique

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Background: Because cross-transmission by health-care workers (HCWs) hands is involved in a large proportion of healthcare-associated infections, hand hygiene has been widely promoted by the World Health Organization (WHO) through a multimodal strategy. One important element of the WHO strategy is the “How to handrub” poster, which details six steps HCWs should perform appropriately to clean their hands. In this sequence, the last step consists of rubbing the fingertips in the palm of the opposite hand (Figure). Despite being performed at the end of the WHO standard technique, fingertips have been pointed as the most critical hand’s site implicated in pathogens cross-transmission. We aimed to evaluate whether modifying the sequence of the WHO “How to handrub” 6 steps-standard technique to clean the fingertips first would lead to a greater bacterial load reduction in controlled laboratory conditions.

Material/methods: This was an experimental study conducted with 15 healthy volunteers from the HUG Infection Control Programme. These HCWs had several years of training in infection control at HUG, with particular expertise in hand hygiene. In the experiment, the hand hygiene action was completed under the close supervision of two senior infection control experts. According to the European Norm 1500 standards, HCWs had their hands contaminated with *E. coli* ATCC 10536 before each of the two tested techniques. They were instructed to perform hand hygiene with 3mL of isopropanol 60% for 30 seconds, on a random order, once using the WHO standard technique and once using the WHO fingertips-first technique. Bacterial counts were retrieved from HCWs fingertips at baseline and after each handrubbing. The primary outcome was the log₁₀ reduction after each handrubbing technique. A mixed linear model with a random effect on the intercept was used; we tested for an interaction between the technique and the hand size category.

Results: Among the 15 participants, 4 had small (25.0%), 6 (37.5%) had medium and 5 (37.5%) had large sized hands; 10 (62.5%) were women. Globally, bacterial log₁₀ counts were 6.18 (±0.86) at baseline, 3.51 (±1.45) after the WHO standard technique application, and 2.74 (±1.28) after the application of the WHO fingertips-first technique (p<0.001). After adjustment for the hand size category and gender, the mean reduction of bacterial count was 0.77 log₁₀ higher (95%CI: 0.27-1.26, p=0.002) following the application of the WHO fingertips-first technique, when compared to the WHO standard technique.

Conclusions: Starting the WHO handrub sequence by the fingertips decontamination led to greater reduction in hands bacterial load when compared to the WHO standard technique. Our findings deserve further validation in clinical practice, but could potentially enhance patient safety in healthcare settings.

Figure: HCW rubbing his fingertips with alcohol-based handrub in the palm of the opposite hand, as described for the WHO fingertips-first technique.

