

### 3C: RCTs: handrub vs. hand scrub with the number of CFUs on participants' hands as outcome

Authors, year, reference	Country/type of study/ setting	Intervention	Comparator	Sampling technique	Primary outcome - CFU on participants' hands	Difference between groups	Cost analysis
<b>HOSPITAL SETTING</b>							
Gupta 2007 <sup>(26)¥</sup> 2007	USA RCT in hospital setting 18 participants	Handrubbing with Avagard®	Hand scrubbing with PVI*	Glove juice method 6 hours after scrub, on days 1, 2 and 5.	Mean CFU log reduction 0.8 ±0.21 with rub; 1.7± 0.87 with scrub	<b>NS difference at any time</b>	
Hajipour 2006 <sup>(27)</sup>	UK RCT in hospital setting (orthopaedic surgeons) 41 procedures	Handrubbing: 5 minutes with CHG for their first case, then 3 minutes with <b>alcohol-based gel</b>	Hand scrubbing: 5 minutes with CHG for their first case, then 3 minutes with <b>CHG*</b>	Fingerprints before/after surgery.	34% (n=19) in the ABHR group. 8% (n=4) were contaminated in the CHG group (positive CFUs after 48 hours). Average CFU count: ABHR 20; CHG 5 ( <i>P</i> not provided).	<b>Scrub&gt;rub (<i>P</i> =0.002)</b>	
Larson 2001 <sup>(28)¥</sup>	USA RCT in hospital setting 25 participants	Handrubbing with Avagard® for 2 minutes	Hand scrubbing with CHG 4% for 6 minutes	Glove juice method on days 1,5 and 19.	Post-scrub mean log CFU reduction: 3.09± 0.54 on day 5; 3.43± 0.98 on day 19 with rub; 3.68± 0.8 on day 5; 4.09± 1.29 on day 19 with scrub ( <i>P</i> =0.002 and <i>P</i> =0.02 respectively).	<b>NS difference except at the 2 specified times</b>	Total cost per application time US\$ 60.38-60.50 for scrub; US\$ 20.40-20.52 for rub.
Ghorbani 2012 <sup>(29) ¥</sup>	Iran RCT in hospital setting 33 participants	Handrubbing with ethanol 70% for 3 minutes	Hand scrubbing with PVI* for 6 minutes	Swab from the fingertips before and after wash and after 30 seconds of glove use.	Mean CFU log reduction 0.47 ±0.27 with rub; 0.5± 0.48 with scrub immediate effect.	<b>NS difference <i>P</i>=0.53</b>	

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Chen 2012 (30)	Taiwan  RCT in hospital setting 50+50 participants	Handrubbing with Avagard® for 3 minutes	Hand scrubbing with PVI or CHG in isopropyl 70% for 5 minutes	Fingerprints immediate after application.	Microorganism CFU counts of 1-9 CFU were detected in 7/50 plates in the rub group, and counts of 1-5 CFU were detected in 7/50 plates in the scrub group.	<b>NS difference</b> (OR: 1; 95% CI: 0.85-1.71; $P=1.00$ )	
Pietsch 2001 (31)	Switzerland  RCT with cross-over design in hospital setting 60 participants	Handrubbing with Sterilium®	Hand scrubbing with CHG 4%	Bag broth technique followed by glove juice method pre- and post-surgery.	Mean CFU log reduction 2.4 ±0.13 with rub; 1.3± 0.12 with scrub immediate effect.	<b>Rub&gt;scrub</b> $P < 0.001$ <b>immediate effect</b> <b>NS difference after surgery</b>	
<b>LABORATORY SETTING</b>							
Rotter 2006 (32)¶	Austria,  RCT multicentre laboratory setting  100 healthy volunteers	Handrubbing with propan-2-OL (70% by volume; isopropanol 70%) or ethanol 85% or propan-1-OL 60%	Hand scrubbing with CHG 4%	Fingerprints immediately after application.	Mean log CFU reduction (that is, the mean of the mean values for all laboratories and both hands) was obtained with the CHG-containing product (1.1 ± 0.3 CFU/mL), isopropanol 70% (1.7 ±0.3 CFU/mL) and ethanol 85% (2.1 ± 0.3 CFU/mL) and with propan-1-OL 60% (2.4 ±0.4 CFU/mL).	<b>Rub&gt;scrub</b> $P \leq 0.001$	

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Mulberry 2001 <sup>(33)¶</sup>  <b>STUDY A</b>	USA  RCT prospective, randomized, partially blinded, parallel group trial 52 healthy volunteers	Handrubbing with the CHG/ethanol hand preparation or CHG 4%	Hand scrubbing with CHG 4%	Glove juice technique at 1 minute, 3 hours, and 6 hours after application on days 1, 2 and 5.	Mean log CFU reduction immediate effect: rub 2.5; scrub 1.8.	<b>Rub&gt;scrub at all times when 2 studies combined (<i>P</i> not provided)</b>	
Mulberry 2001 <sup>(33)</sup>  <b>STUDY B</b>	USA  RCT prospective, randomized, partially blinded, parallel-group trial 33+30+20 healthy volunteers	Handrubbing with the CHG/ethanol hand preparation, or an ethanol 61% vehicle control	Hand scrubbing with CHG 4%	Glove juice technique at 1 minute, 3 hours and 6 hours after application on days 1,2 and 5.	Mean log CFU reduction immediate effect with CHG ethanol: 2.6 and 1.6 with scrub; 1.1 with vehicle.	<b>Rub&gt;scrub when 2 studies combined (<i>P</i> not provided)</b>	

\* CHG: chlorhexidine gluconate; Avagard®: 61% ethanol and 1% CHG; Sterilium®: 75% aqueous alcohol solution, propanol-1, propanol-2, and mectronium; RCT: randomized controlled trial; UK: United Kingdom; USA: United States of America; CFU: colony-forming unit; PVP-I: povidone iodine; NS: not significant.

¶The studies included in the grade tables with the same outcome measure and NS results. Individual studies have not been graded.