



Standardising the Efficacy Testing of Reprocessing Procedures for Semi-Critical Medical Devices. A Case Study Using UV-C Chambers for Ultrasound Probes

Brill FHH (presenting), Ulatowski A, Gabriel H, Walendy-Gnirß K

INTRODUCTION

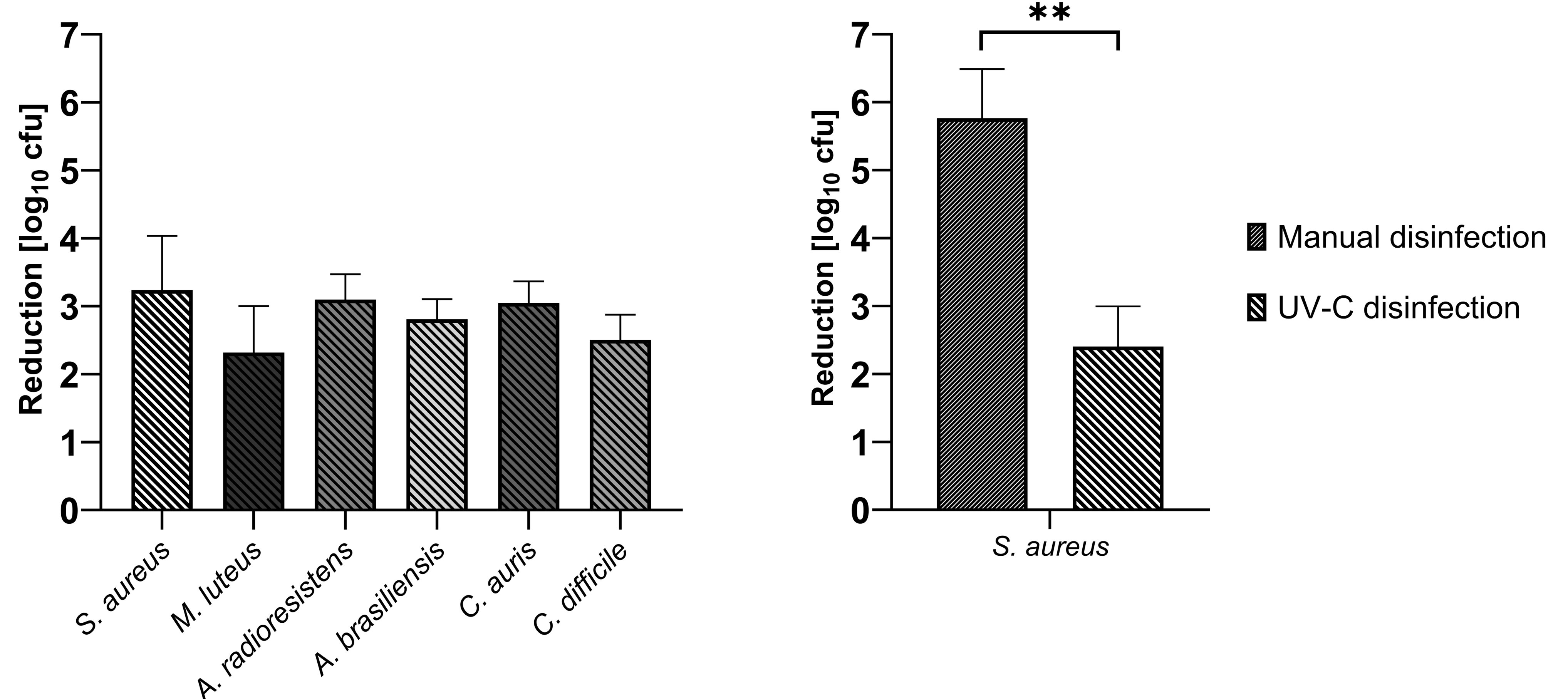
Reusable semi-critical medical devices such as ultrasound probes and endoscopes require effective reprocessing to prevent health-care-associated infections. Traditional applications include wiping, soaking, and washer-disinfectors, but recently UV-C-based disinfection is used for this purpose. Despite its growing use, efficacy test standards have not kept pace with these advances, and applicability of EN 14885 standards for chemical disinfectants is questionable, creating an unclear efficacy evaluation for UV-C performance under practical conditions.

METHOD

We propose a novel method for assessing UV-C disinfection chambers using clinically relevant microorganisms specified in EN 14885, EN 16615, and EN 17846: the bacterium *Staphylococcus aureus*, bacterial spores of *Clostridioides difficile*, the yeast *Candidozyma auris* and the fungus *Aspergillus brasiliensis*, plus UV resistant species *Micrococcus luteus* and *Acinetobacter baumannii*. A new carrier was selected based on size, shape, and material of target devices, providing a realistic challenge. The contamination method and acceptance criteria were aligned with EN 16615 and EN 17846 phase 2 tests for chemical surface disinfectants.

RESULTS

Testing demonstrated the method achieved acceptable recovery and quantification of log reductions per EN standards. Manual disinfection achieved a significantly greater reduction in *S. aureus* compared with UV-C disinfection (Mann Whitney U test, $p = 0.0045, **$).



CONCLUSION

- The UV-C disinfection chamber evaluated did not meet the required acceptance criteria for all tested microorganisms
- It achieved 2 – 3 log₁₀ reduction, indicating insufficient microbial reduction under realistic conditions.
- These findings suggest that UV-C, despite its broad antimicrobial activity, requires practice-like qualification ensuring correct application conditions (time and dose)
- Development of a dedicated standard defining test criteria for UV-C devices is critical for patient safety.

CONTACT INFORMATION

Florian H. H. Brill, Institute for Hygiene and Microbiology,
Dr. Brill + Partner GmbH, 28259 Bremen, Germany,
www.brillinstitutes.com
florian.b@brillhygiene.com

