

A Preliminary Field-Relevant Test to Assess Decontamination of High-Touch Environmental Surfaces: Testing with *Staphylococcus aureus*

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Editor's note:

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Disclosures: The authors of this article are employees of [CremCo Labs](#).

Abstract

Background

High-touch environmental surfaces (HITES) can be vehicles for healthcare-associated infections (HAI). However, their decontamination by wiping is rarely assessed reflecting field use. Here, we report the development and application of a new carrier platform to quantitatively assess HITES decontamination by wiping with a microfiber-based fabric dampened with a neutral pH solution (~ 200 ppm chlorine) of hypochlorous acid (PCS).

Materials & Methods

The platform (30 cm X 60 cm) was custom-designed and made out of Teflon with perforations to separately imbed nine carrier disks in it. Each disk (1 cm diam.; 0.7 mm thick) of brushed stainless steel was individually placed into the holes for a tight fit and the platform sterilized by autoclaving. Six of the disks received 10 µL of a *Staphylococcus aureus* (ATCC 6538) suspension (>10⁶ CFU) in a soil load, and the inocula dried under ambient conditions for two hours. Three of the disks were left uncontaminated to assess any transfer of contamination during wiping. For decontamination, the entire platform was wiped in two steps with a dampened microfiber fabric in a field relevant manner. After 30 seconds the disks were then retrieved directly and simultaneously into separate vials containing 10.0 mL of an eluent/diluent/neutralizer. The eluates were assayed for CFU by membrane filtration and log₁₀ reductions calculated. Normal saline with 0.1% Tween-80 (saline-T) was used as a control solution for wiping.

Results

This preliminary testing showed the platform to keep the disks in place during wiping and also allowed the wiping itself to better represent the decontamination process in the field. Wiping with the hypochlorous acid disinfectant brought the contamination to an acceptable level ($>5 \log_{10}$ reduction) with no transfer of contamination to clean disks.

Conclusion

The device and the protocol described can quantitatively determine HITES decontamination in a field relevant manner. The platform and the decontamination process are also potentially applicable to not only other kinds of carrier materials but also to assess HITES decontamination using other classes of pathogens implicated in HAI. The use of microber fabric greatly reduced the number of CFU, but was further enhanced by the addition of the hypochlorous acid.

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