Evaluation of novel “no-touch” technologies for decontamination of toys in pediatric healthcare settings

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Background

- Toys in playrooms are often shared among patients in pediatric healthcare settings and could present a risk for transmission of bacterial and viral pathogens
- Effective cleaning and disinfection of toys using disinfectant wipes is labor-intensive and difficult due to irregular surfaces
- The role of contamination of surfaces and particularly of toys has received little attention from hospital infection control and research teams and it is considered a priority

Methods

- Point-prevalence culture survey: toys and high-touch surfaces in playrooms in a pediatric healthcare facility
- Lab evaluation: toys inoculated with methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant entrococci (VRE), *C. difficile*, and *Candida auris*
- Three novel “no-touch” technologies evaluated:
  - A. Electrostatic sprayer with a sporicidal disinfectant
  - B. Ultraviolet-C box (18.9 x 9.9 x 1.8 inches)
  - C. High-level disinfection cabinet using ultrasonic sub-micron droplets of peracetic acid and hydrogen peroxide

A

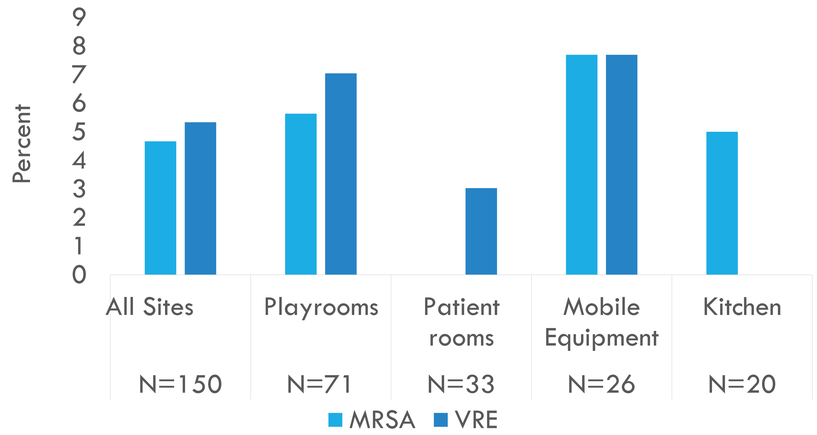
B

C

Results

- Of 150 items cultured in playrooms, 4 (5.6%) were contaminated with MRSA, 5 (7.0%) were contaminated with VRE, and none were contaminated with *C. difficile* (Fig. 1.)
- Each of the technologies reduced all pathogens by ≥4 $\log_{10}$CFU on all types of toys tested (plastic, soft rubber, & tablet)
- The electrostatic sprayer was considered the easiest to use and was preferred by all users as large numbers of toys could be processed quickly (ie, spray for 20 seconds and allow to air dry)
- The disinfection cabinet cycle required 21 minutes, while the decontamination cycle for the UV box was only 30 to 90 seconds but with limited capacity to hold toys

Fig. 1



Conclusion

- Three “no-touch” technologies were effective for decontamination of toys
- The electrostatic spray application of disinfectant was considered the easiest to use for rapid decontamination of toys

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