

Clinical Study

Assessment of Cleaning Methods on Bacterial Burden of Hospital Privacy Curtains: A Pilot Randomized Controlled Trial

Cadogan K, Bashar S, Magnusson S, Patidar R, Embil J et al. Sci Rep. 2021 Nov 8;11(1):21866. doi: 10.1038/s41598-021-01198-2

Study Overview

Privacy curtains are a potential route of transmission of healthcare-associated infections in hospitals. This study evaluated the bioburden of bacteria, including methicillin-resistant *Staphylococcus aureus* (MRSA), on curtains after regular use and compared it to the bioburden after cleaning with either Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Spray (CHP spray) or Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Wipes (CHP Wipes).*

The study found that cleaning significantly reduced bacterial contamination on privacy curtains used in a burns/plastic surgery ward in a regional burn center in Canada. The findings indicate that cleaning curtains with CHP products at least every 3-4 days could reduce the number of contaminated curtains and keep the bacterial bioburden on contaminated curtains at a low level.

Key Findings

▶ By day 21, the bioburden on the control group (no treatment) was statistically higher than curtains sprayed or wiped with hydrogen peroxide ($p < 0.05$). There was no statistical difference in bioburden between sprayed or wiped curtains (Table 1).

Table 1. Bacterial bioburden on curtains before and after hydrogen peroxide treatment.

	Bacterial bioburden on curtains
Control group	2.2 CFU/cm ²
Wiped	1.5 CFU/cm ²
Sprayed	1.3 CFU/cm ²

*Note that EPA and Health Canada regulations only allow soft surface sanitization claims on spray products.



- ▶ After curtains were cleaned with hydrogen peroxide disinfectant, the bioburden was reduced to the day zero level, but contamination increased over time after cleaning.
- ▶ By day 21, a significantly greater percentage of the control curtains not cleaned were contaminated with MRSA. There was no statistical difference in MRSA contamination between sprayed or wiped curtains (Figure 1).

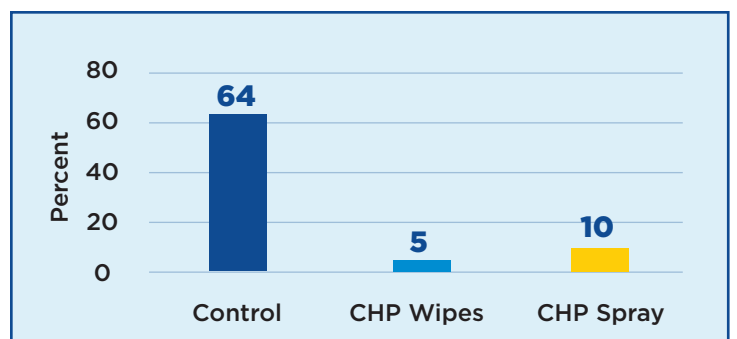


Figure 1. Percent of curtains with MRSA contamination at day 21.

Methods

The study was a pilot cluster randomized trial involving 3 groups of 24 polyester-blend privacy curtains hung in 2- and 4-patient occupancy rooms. Curtains in group 1 were cleaned with CHP wipes and in group 2 with CHP spray at 3-4 day intervals. In group 1, one wipe was simultaneously pressed on either side of the designated area, and two passes of the wipe were made. In group 2, each side of a designated area of the curtain was sprayed five times. Curtains in control group 3 were not cleaned. In each group, 2 additional curtains were hung in non-patient rooms. Cultures from curtains were collected before and after cleaning using agar plates, with curtains sampled at alternating 3-4 day schedules over the course of 3 weeks for a total of 24 samples for each curtain. The primary outcome was bioburden on curtains at day 21. The secondary outcome was percent of curtains contaminated with MRSA at day 21.

Discussion

This study demonstrated that privacy curtains become contaminated with bacteria such as MRSA within a relatively short period of time (3-4 days).

While there are no clear acceptable levels for bacterial bioburden on hospital surfaces, it has been suggested that bioburden should be no more than 2.5 CFU/cm². In this study, 35% of samples from control curtains contained >2.5 CFU/cm², compared with 11% from

sprayed curtains and 12% from wiped curtains. Cleaning with a hydrogen peroxide spray or wipe significantly reduces bioburden. Cleaning needs to occur at regular intervals, and frequent cleaning may reduce antibacterial growth over time. The limitations of the study include the loss of some curtains during the study, which reduced sample size, the unknown distribution of MRSA-colonized patients throughout the study and the uncertainty as to whether bacteria on privacy curtains directly cause healthcare-associated infections.

Conclusion

The study found that clean hospital privacy curtains gradually became contaminated over time with bacteria, including MRSA. Cleaning every 3-4 days with either Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Spray or Wipes significantly reduced the bioburden.

Related studies

Other studies have also evaluated the efficacy of Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Spray on soft surfaces. In a 2015 study, spraying was shown to reduce the proportion of soft surfaces, including chairs, privacy curtains and blood pressure cuffs, that were contaminated by 90%¹, and reduced bacterial bioburden by almost 95%.¹ In a 2014 study, spraying reduced the bacterial bioburden on privacy curtain grab areas by 97%.² In ICU rooms of patients on contact precautions, vancomycin-resistant *enterococci* (VRE) and MRSA were completely eliminated.²

Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant



- ▶ 30-second to 1-minute disinfecting contact times on most bacteria and viruses
- ▶ Kills over 38 common HAI and outbreak-causing pathogens, such as CRE and MRSA
- ▶ EPA-registered to kill bacteria on soft surfaces in 30 seconds



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2. Rutala WA, Gergen MF, Sickbert-Bennett EE, Williams D, Weber DJ. Effectiveness of improved hydrogen peroxide in decontaminating privacy curtains contaminated with multidrug-resistant pathogens. *American Journal of Infection Control*, 2014; 42(4):426-8.

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