



Enhanced disinfection can reduce microbial contamination and decrease patient colonisation and HAI

Pragmatic, prospective, multicenter, cluster-randomized trial

WHAT WAS INVESTIGATED?

The study investigated the effectiveness of three enhanced methods of terminal room disinfection against standard practice. These methods included:

- Quaternary ammonium manual disinfection (Quat) + ultraviolet light (UV)
- Bleach
- Bleach + UV

The methods were compared to Quat alone as standard practice.

4 epidemiologically important pathogens (EIPs) were chosen as markers to study bacterial transmission. These included:

- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant Enterococci (VRE)
- *Clostridioides difficile*
- Multidrug-resistant (MDR) *Acinetobacter* ssp.

It was analysed if the EIPs were present only in patient rooms, in the bathroom, or in both.

WHAT WAS THE RESULT?

Main Result: Reducing the room contamination with EIPs by **94 %** was associated with a **35%** decrease in patient colonization and/or infection.

Quat plus UV was significantly superior to Quat alone in reducing EIPs. It significantly reduced MRSA, VRE and MDR *Acinetobacter* in both the patient room as well as the bathroom.

Enhanced terminal disinfection leads to a decreased room contamination and subsequently to a decrease in patient colonization and/or infection.





BACKGROUND

Contaminated surfaces are an important factor in the transmission of pathogens and, consequently, healthcare associated infections (HAI). Therefore, surface disinfection is crucial for successful infection prevention in the hospital setting.

GOAL

Analysis of microbiological data from the Benefits of Enhanced Terminal Room (BETR) Disinfection Study to evaluate the effectiveness of 3 enhanced methods for terminal room disinfection in reducing relevant pathogens associated with patient colonization and/or infection.

DESIGN AND METHODS

This study was a substudy of the BETR Disinfection Study and designed as a pragmatic, prospective, multicenter, cluster-randomized trial. In the time period from April 2012 to July 2014 three different strategies for terminal room disinfection were evaluated against standard method. In total, 92 rooms were sampled as follows:

- Standard method
 - Quat (21 rooms)
- Enhanced methods
 - Quat + UV (26 rooms)
 - Bleach (23 rooms)
 - Bleach + UV (20 rooms)

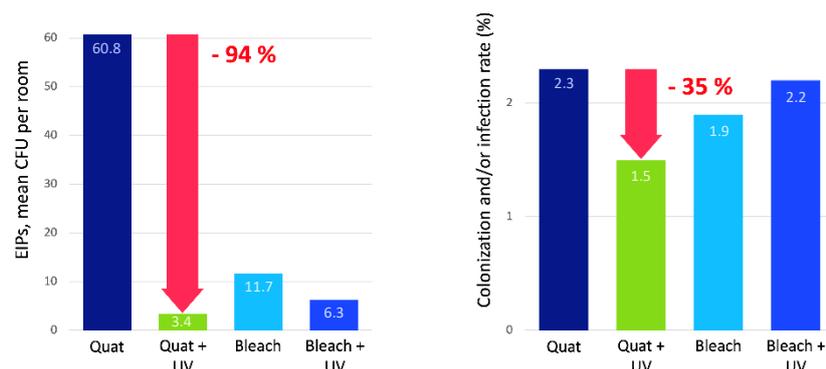
The selected patient rooms were single-rooms of previously discharged or transferred patients under contact precautions. All rooms were randomly selected. For analysis, microbiological samples were taken from different environmental surfaces in the patient room and the bathroom (e.g., bed rail, medicine cart, sink, toilet seat). The total and average number of colony-forming units (CFU) of the 4 EIPs that remained in the patient room following terminal room decontamination were determined. Standard protocols were used for microbiological analyses and identification.

RESULTS

Quat plus UV was significantly superior to Quat alone in reducing EIPs in the patient room, bathroom, and both. In the patient room plus bathroom it significantly reduced MRSA, VRE, and MDR Acinetobacter. In the bathroom alone, it reduced MDR Acinetobacter and MRSA. The other two methods also reduced EIPs but the reductions didn't reach statistical significance compared to Quat alone.

As shown in figure 1, a reduction in surface contamination by 94 % is associated with a 35 % reduction of patient colonization and/or infection.

Figure 1: Relationship between EIP reduction and patient colonization and/or infection



CONCLUSION

The study illustrates that enhanced environmental disinfection methods were significantly superior to a standard method. In order to reduce the risk of HAIs, hospitals may use methods for enhanced terminal disinfection, especially in patient rooms under contact precautions.

