Cleaning Hospital Room Surfaces to Prevent Health Care-Associated Infections

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ABSTRACT

Healthcare-associated infections (HAIs) are the leading cause of illness and death world-wide. A multifaceted approach to preventing infection is critical to reducing the risk for HAIs as several studies demonstrate that healthcare-associated pathogens frequently contaminate the patient environment, including both porous surfaces and hard non-porous surfaces. Contaminated surfaces are a reservoir for the transmission of pathogens directly through patient contact with the environment or indirectly through contamination of health care workers' hand or gloves.

BACKGROUND

Environmental cleaning is important for reducing microbial contamination of surfaces and subsequent risk for HAIs. Environmental cleaning is a complex, multifaceted process that involves the physical action of cleaning surfaces to remove organic and inorganic material, followed by application of a disinfectant, as well as monitoring strategies to ensure the appropriateness of these practices. In addition, contextual factors, such as management tools and organizational structure, and culture can affect the implementation and effectiveness of cleaning, disinfecting, and monitoring strategies. The goal of this review is to provide a systematic overview on environmental cleaning of hospital room surfaces to prevent HAIs.

STUDY

Twelve key informants with expertise in infectious diseases, infection control, environmental disinfection, hospital epidemiology, microbiology, and management of environmental services in staff in health care settings were interviewed, and a systematic search for publications was done with the use of several bibliographic and gray literature resources. Studies examining surface contamination, colonization, or infection with Clostridium difficile, methicillin resistant Staphylococcus aureus (MRSA), or vancomycin-resistant enterococci (VRE) were included. The literature searches yielded 80 clinical studies for inclusion in the review. The primary setting for most studies was the intensive care unit. The most commonly examined high-touch objects included bed rails, call buttons, light switches, side or tray tables, and toilets. Strategies for Environmental Cleaning Studies examining chemical disinfectants reported mixed findings, including studies that showed certain products ability to reduce HAIs such as VRE and C. difficile. Several studies also integrated various wipes into preventive strategies and reported positive outcomes, including sustained reduction in C. difficile infection rates. Studies also examined the effectiveness of no-touch methods and enhanced coatings (such as copper-coated surfaces) that also reported positive findings.

Strategies for Monitoring Cleanliness

A comprehensive review of the scientific literature indicated that fluorescent/UV surface markers and adenosine triphosphate bioluminescence were the most commonly evaluated monitoring methods. It was concluded that these monitoring methods were useful and highly objective and helped achieve substantial improvements in cleaning and disinfecting practices.

Visual observation was found to be inferior to various other monitoring methods.

Implementing Cleaning and Monitoring Strategies

It was determined that there was a variety of external factors that influenced implementing cleaning and monitoring strategies. External factors that affect environmental cleaning efforts included adherence to evidence-based policies and procedures from various organizations, a positive patient safety culture that fosters collaboration and respect among clinical and support services staff, as well as between supervisors and front-line personnel. Implementation and management tools were identified as key contextual factors and include staff education and training, dedicated training time, use of internal audit and feedback, and presence of internal or external persons responsible for implementation. Education was reported as a key component in most.

CONCLUSION

The review of the literature indicates an increased interest in environmental cleaning and disinfecting for the prevention of HAIs. However, there are many limitations in the current evidence base. Future research on environmental gaps will be critical for informing real-world interventions for reducing the risk for HAIs in the hospital setting.

REFERENCE

Han JH, Sullivan N, Leas BF, Pegues DA, Kaczmarek JL, Umscheid CA. (2015). Cleaning Hospital Room Surfaces to Prevent Health Care–Associated Infections. Ann Intern Med. 163(8): 598-607.