

# More evidence needed to identify best methods to clean hospital rooms, prevent infections

August 10 2015

---

Tray tables, bed rails, light switches, and toilets: All are common vectors for swapping germs between patients and health care workers. While a new systematic overview in this week's *Annals of Internal Medicine* points to several promising cleaning tactics of these "high-touch surfaces," there's a lack of evidence as to which is the most effective at reducing healthcare-associated infections (HAIs). Few studies measured patient outcomes or focused on newer technologies, and even less compared cleaning tactics against one another—important gaps to fill as the U.S. health care system works to reduce the 75,000 HAI-related deaths that occur annually.

The systematic overview was led by Craig A. Umscheid, MD, MSCE, an assistant professor of Medicine and Epidemiology in the Perelman School of Medicine at the University of Pennsylvania, and Senior Associate Director at the ECRI Institute-Penn Medicine Agency for Healthcare Research and Quality (AHRQ)-funded Evidence-Based Practice Center (EPC), Jennifer Han, MD, MSCE, an assistant professor of Medicine and Epidemiology, and Brian Leas, MS, MA, and Nancy Sullivan, research analysts in the ECRI-Penn AHRQ EPC, and revealed major gaps in existing evidence for the best practices for cleaning hospital room surfaces to prevent HAIs, including *Clostridium difficile*, MRSA, and VRE.

"The cleaning of hard surfaces in hospital rooms is critical for reducing

healthcare-associated infections," said Han, the study's lead author. "We found that the research to date does provide a good overall picture of the before and after results of particular cleaning agents and approaches to monitoring cleanliness. Researchers now need to take the next step and compare the various ways of cleaning these surfaces and monitoring their cleanliness in order to determine which are the most effective in driving down the rate of hospital-acquired infections."

While studies examining HAIs have increased over the last 15 years, infections acquired in the hospital remain a leading cause of death and morbidity. In 2011, there were over 721,000 HAIs in the U.S., according to the most recently available data from the U.S. Centers for Disease Control and Prevention (CDC). What's more, many experts believe that only 50 percent of surfaces are typically disinfected during cleaning of a patient's room.

Examining 80 studies published between 1998 and 2014, the research team found that comparative effectiveness studies were uncommon. Such studies would have directly compared different ways of cleaning, disinfecting, and monitoring the cleanliness of hard surfaces in order to determine which were most effective. There were also relatively few studies that focused on measuring outcomes of most interest to patients, such as changes in HAI rates or the presence of pathogens on patients. Only five of the studies were randomized controlled trials.

Instead, the existing studies were largely before and after experiments, comparing the magnitude of surface contamination after cleaning with a particular agent to the magnitude of contamination before cleaning. Over 65 percent of the studies assessed surface contamination, such as bacterial burden and colony counts, as the primary outcome. Less than 35 percent reported on patient-centered outcomes, such as HAI rates or acquisition of a specific organism in the body, known as colonization.

The ECRI-Penn EPC team looked at three broad categories of evidence: 1) which agents and methods were used to clean hard surfaces; 2) what approaches were available to monitor the effectiveness of cleaning; and 3) what systems-level factors are needed for cleaning and monitoring to be successful. In addition to its literature review, the researchers interviewed a number of national experts.

"Our goal was to provide a comprehensive review of evidence in all three domains," said Umscheid, the study's senior author. "While there is a clear need for more patient-centered and comparative effectiveness research, the findings that do exist provide a good place to start in terms of a hospital or [health care](#) entity seeking information on ways to mitigate healthcare-associated infections."

Among its findings, the EPC team identified several studies showing that rates of *C. difficile* (or "C. diff"), the most common cause of hospital-acquired gastrointestinal infections, fell with the use of bleach-based disinfectants but that a chlorine dioxide-based product was ineffective in reducing C. diff contamination and infection rates. Patients taking antibiotics are at special risk of becoming infected with C. diff because antibiotics can disrupt the normal bacteria of the bowel. According to the CDC, C. diff caused almost half a million infections in the United States in 2011.

In addition, six studies integrating various wipes moistened with hydrogen peroxide and other chemicals into preventive strategies reported positive outcomes, including sustained reductions in HAIs. Seventeen studies implementing "no-touch" modalities to clean hard surfaces - such as devices that emit ultraviolet light or hydrogen peroxide vapor - reported positive findings, with three specifically demonstrating reductions in infection rates. Seven of eight studies evaluating enhanced coatings on hospital room surfaces, such as copper-coated bed rails, reported positive findings. Surfaces made of solid, copper-based metals

or alloys continuously kill bacteria that cause infections.

The EPC team also highlighted several priority areas for future research, based on their review of the evidence and interviews with leading experts. Questions to emphasize in future studies include: what surfaces present the greatest infection risk to patients, what benchmarks should be established for measuring cleanliness, and what factors affect the quality of routine disinfection practices? Further research is also needed on recently emerging disinfection strategies.

"In addition to expanding the use of [comparative effectiveness research](#) and placing greater emphasis on patient-centered outcomes, future research should investigate the effectiveness of a number of promising new technologies and approaches," said Han. "These include self-disinfecting coatings and increasingly used surface markers for monitoring the presence of pathogens. Other challenges include identifying high-touch surfaces that confer the greatest risk of pathogen transmission and developing standard thresholds for defining cleanliness."

Provided by University of Pennsylvania School of Medicine

Citation: More evidence needed to identify best methods to clean hospital rooms, prevent infections (2015, August 10) retrieved 19 April 2024 from <https://medicalxpress.com/news/2015-08-evidence-methods-hospital-rooms-infections.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--