



## case study

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# Hospital Surface Hygiene: The Opportunity for Continuous Antimicrobial Protection

Contaminated hospital environments play a key role in the transmission of certain pathogenic microbes related to healthcare-associated infections (HAIs),<sup>1</sup> and the Centers for Disease Control and Prevention (CDC) recommends that hospital rooms be routinely disinfected or cleaned in addition to other measures.<sup>2</sup> Performing this in the setting of large hospital facilities is challenging, especially while providing around-the-clock care. The dynamic flow of people in and out of hospitals (patients, visitors, and a staff typically three times as numerous as there are hospital beds) can impede the goal of sustaining a healthy, healing environment.

### Challenge #1: The Continuously Contaminated Environment

In hospitals, up to 20 percent of healthcare-acquired pathogens are estimated to come from places outside of the patients themselves, implicating the environment and other sources.<sup>3</sup> Furthermore, contamination of the environment or other patient-care items has been identified as an important factor in the transmission of methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), *Clostridium difficile* (*C. diff*), *Acinetobacter*, and norovirus.<sup>4</sup> Despite rigorous cleaning efforts, it has also been shown that admission to a room previously occupied by a patient either colonized or infected by MRSA, VRE, *Acinetobacter*, or *C. difficile* is a risk factor for the next patient to develop an infection or colonization as well.<sup>4</sup>

While Infection Prevention has focused on improving disinfection for high-touch surfaces (like bed rails), newer research has also implicated portable and shared equipment as key sources of transmission.<sup>5</sup> Shared objects like wheel-chairs have been tracked throughout healthcare systems to better understand their movement and exposure.<sup>5</sup> Beyond shared equipment, the literature has recently identified contaminated floors as potential fomites for pathogens like *C. difficile* spores and other multidrug-resistant organisms.<sup>6</sup> More pathogen-harboring fomites are identified as research focuses on finding other places where these organisms can be found.

Patients themselves also seem to be able to sense the difference in environmental. In "Environmental Services: Delivering on the Patient-Centered Promise," a Press Ganey whitepaper, the authors find that hospital cleanliness as perceived by patients is highly correlated with infection rates. Specifically, a correlation was observed between the patient perception of cleanliness (as measured by Hospital Consumer Assessment of Healthcare Providers and Systems [HCAHPS] scores) and HAIs. For example, hospitals viewed as the least clean had higher associated rates of MRSA infections, and conversely, hospitals viewed as the cleanest had the lowest associated rates of *C. difficile* infections.<sup>6</sup>

### Challenge #2: Hurdles to Compliant Environmental Hygiene

In addition to more surfaces being identified as harboring

pathogens, environmental hygiene faces another hurdle – the huge hurdle of compliantly cleaning and disinfecting these surfaces in the first place.

In the complex hospital ecosystem, environmental services (EVS) and nursing departments face a myriad of challenges, like time pressures and burnout. EVS performs complicated daily and terminal cleaning processes in all areas of the hospital while closely coordinating patient flow with nursing personnel. These key members of the healthcare team are instrumental in keeping hospitals as clean as possible, providing excellent patient care, and optimizing hospital operations.

In cleaning and disinfecting hospital surfaces, EVS workers focus attentively on improving hospital aesthetics, and their work product is highly visible. From the patient's perspective, this team represents the first of multiple infection prevention efforts encountered during a care episode. However, EVS workflow can face administrative management pressures, such as throughput demands and staffing challenges, on top of their primary objective of complete compliance with cleaning protocols. Whatever the stressor or exact cause, cleaning and disinfection failure modes are a highlighted topic in infection prevention circles. For example, one study identified that only 48 percent of environmental surfaces (14 standardized objects) were cleaned at baseline. After interventions including the provision of feedback to EVS staff, the percent of surfaces cleaned increased to 77 percent.<sup>7</sup>

### Potential for Emerging Continuous Antimicrobial Solutions

Studies have shown that contaminated surfaces can contribute to the transmission of healthcare-associated pathogens, and that improved cleaning and disinfection can reduce this transmission.<sup>8</sup> Given the potential risk of contaminated surfaces, continuous antimicrobial products and technologies, such as residual activity chemicals and UV lights, were recently reviewed in an article published by the *American Journal of Infection Control* in June 2019. The article by David J. Weber, "Continuous room decontamination technologies," explores these technologies because cleaning still remains inadequate.<sup>1</sup>

Alternatives like long-lasting or persistent antimicrobials or microbiostatics are newer to the fight to keep hospitals clean by continuously impacting that ability of microbes to thrive on hospital surfaces. Studies like this one demonstrate the associated reduction in HAI rates that occur with use of long-lasting, residual activity products. Infection Preventionists can help pioneer the call for and use of new products to help support their EVS colleagues in the daily battle to keep healthcare environments safer. 

Maha El-Sayed, PhD, is chief science officer of Allied BioScience. References for this article and other information are available at [www.alliedbioscience.com](http://www.alliedbioscience.com)