



Infection Control: Flooring and Anti-Microbial Additives in Healthcare Facilities

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Healthcare Acquired Infections

Few topics receive more attention in healthcare facilities than nosocomial or healthcare acquired infections (HAI), and the environmental additives intended to prevent them. Nosocomial infections are a result of treatment in a hospital or a healthcare service unit, but not secondary to the patient's original condition. Infections are considered nosocomial if they first appear 48 hours or more after hospital admission or within 30 days after discharge.¹ Sources of microbes in the healthcare environment include people, aerosolized fluids and surfaces. It is flooring surfaces which are the subject of this paper, and also antimicrobial additives, which are often incorporated into or applied to flooring with the intention of preventing transmission of HAI.

Flooring is one of the most pervasive surfaces in healthcare. It is literally everywhere. Its functions often vary by specialty area, which often governs what type of flooring can be used. And although flooring appears as a monolayer, it is often a complex assembly of several different materials, requiring a specific sequence of steps and additional materials, like adhesives, to install. Once treated as an afterthought, flooring is now front-and-center in the specification process for both remodeling and new construction.

This places a burden on those who select, specify and purchase flooring. These professionals must now be well-informed on a variety of technical subjects including infection control, flooring safety, acoustics, ergonomics and maintenance and how all of these relate to patient outcomes and staff performance.

Fortunately, the growing interest in the above has resulted in current, relevant research on flooring, how it relates to nosocomial infections and antimicrobial additives in healthcare.

It should be noted that, according to the Centers for Disease Control, that there are virtually no clinical studies that link flooring to the rate of nosocomial infections.²

Discussions

Some recent relevant discussions of flooring, infection control and environmental anti-microbial additives are cited below:

- Leib and Rhode reported that testing showed that hard surfaced flooring such as vinyl and linoleum were possibly more likely to transmit a bacterial infection than carpeted flooring.³
- In testing the integrity of carpet tile seams as an impediment to microbial contamination and moisture, Harris et al reported that bacterial colonization was no more likely to occur at seams in carpet tiles than at any other point on any other type of flooring found in healthcare.⁴
- Carling et al, in a landmark 39 hospital study, reported no evidence that implicated flooring as a source of nosocomial infections. This same study showed there was no evidence that proved that antimicrobial additives actually reduced the incidence of nosocomial infections.⁵
- Similar findings by Sauerhoff in 2008 showed that contrary to anecdotal evidence, carpet actually decreases the likelihood of transmitting infections because of its ability to sequester biological contaminants until they can be removed by proper cleaning.⁶

- According to the US Centers for Disease Control, “Evidence is lacking, demonstrating the efficacy of antimicrobials when applied to or incorporated in/on inanimate surfaces of patient care equipment, fixtures, or furnishing, including soft carpeting, specifically for prevention of hospital acquired infections.”²

- In a presentation at Healthcare Design, 2009, epidemiologist Judene Bartley stated that “Antimicrobial treatments are submitted to the EPA as preservatives of the treated substrate. Claims of disease prevention under scrutiny by the EPA are lacking supportive scientific evidence.”⁷

Flooring In Healthcare

The study by Carling et al is especially enlightening, given the large number (ultimately 90 hospitals) of facilities involved. The study reached the following conclusions regarding flooring in healthcare facilities:

- Flooring of all types, hard and soft, has merit for the right place and right population.
- Acoustics, perception, mobility and safety are critical criteria that must be addressed, along with patient and caregiver comfort and satisfaction.
- There was no evidence that floor covering of any type is a source of hospital acquired infections.
- Although some anti-microbial environmental additives were shown to reduce the number of microbes in laboratory tests and on treated surfaces but did not inhibit cross-transmission, and there was no evidence that this actually reduced the rate of in-hospital acquired infections.

The Mohawk Group

The Mohawk Group’s position on anti-microbial additives for carpet is consistent with the consensus position of the membership of the Carpet and Rug Institute, as summarized by the position paper on antimicrobial additives published by the Carpet and Rug Institute in 2007⁸:

“The Carpet and Rug Institute neither encourages nor discourages the use of antimicrobial treatments in finished carpets. Each carpet manufacturer is most knowledgeable about its own carpet, and CRI recommends that consumers consider the many factors pertaining to the use of antimicrobial treatments in carpets, and follow the individual manufacturer’s recommendations about the use of these treatments. Whether or not a manufacturer chooses to incorporate one of these treatments, antimicrobial additives should never be positioned as a substitute for proper moisture control and maintenance.”

The Mohawk Group recognizes the importance of gaining a full understanding of the role of flooring and environmental ant-microbial additives in addressing the challenges associated with nosocomial infections in hospitals.

The Mohawk Group is a member of the Center for Health Design, the American Academy of Healthcare Interior Designers, the Health Industry Advisory Council and other professional associations, and partners with thought leaders in industry and academia on topics related to flooring in healthcare architecture and design.

About Keith Gray

Keith Gray is director of technical marketing for The Mohawk Group and its four brands – Karastan, Lees, Bigelow and Durkan. Recognized as a leader in evidenced-based design research by major architecture and design firms, Gray assists with developing the business and marketing strategy for The Mohawk Group's healthcare and education markets. He also drives the organization's research and knowledge gathering efforts in these key sectors.

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