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Performance Criteria for Resilient Flooring in Acute Care Hospitals

Introduction

Flooring is one of the largest surfaces in hospitals. It has significant impact on safety, infection control, appearance, maintenance, return-on-investment, clinical efficiency, and patient outcomes.

Criteria

Flooring selection begins with the needs of the project, which are outlined in the basis of design during the schematic design phase.[1]

The Facility Guidelines Institute (FGI) *Guidelines for Design and Construction of Hospitals and Outpatient Facilities*, 2018, identifies the essential criteria in section A2.1-7.2.3.1[2] as follows: floor softness vs. firmness; condition of the subfloor; performance under pressure; pattern; contrast; reflectivity; sound absorption; sound transmission; cleanability; slip-resistance; resistance to cleaning and disinfecting agents; absorbency; smoothness; monolithic construction; requiring an integral coved wall base; sealed joints; and transitions between flooring types.

The Center for Health Design (CHD) uses Evidence Based Design (EBD) methodology to identify flooring performance goals. Safety, including fall protection and infection control, is critical, along with acoustic performance, indoor air quality, return on investment, reduction of staff fatigue, and improved patient satisfaction. Sustainability, durability, warranty, life-cycle cost, and maintenance are also important factors.

Preparation of Substrates

ASTM F710-19e1 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring is the standard for preparation of the substrate. Manufacturers also have installation requirements, which, notably, guarantee warranties when followed. It is highly recommended that the most stringent requirements be met at every opportunity.

Interrelationship of Materials and Maintenance

Applications requiring homogeneous flooring necessitate vertically monolithic material; this selection is driven by considerations such as the effect of dropped knives and sharp objects. Where aesthetic is the priority, heterogeneous flooring, made up of layers that include a backing, an image, and a wear layer, are preferable. Health care-associated infections (HAIs) can be mitigated by specifying either homogeneous or heterogeneous resilient floors in sheet form. According to the Centers for Disease Control (CDC), one in every 20 hospital patients acquires an infection while being treated for other conditions.[3] Selecting never-wax, matte finish, high performance flooring eliminates sticky, high-gloss polish that attracts and holds dirt and microorganisms.

Traditional cleaning technology uses high concentrations of surfactants that contribute to residue. Residue harbors a biofilm of bacteria that stick to each other in an extracellular polymeric substance matrix. According to the CDC, "bacteria within biofilms are up to 1,000 times more resistant to antimicrobials than the same bacteria in suspension."[4] Floor finish selection should consider whether the chemicals used to clean the floor will reduce residue, and thereby reduce biofilms. The need to strip biofilms from floors has driven the popularity of no-polish sheet flooring, which requires fewer steps to appear clean and be disinfected. The two-step cleaning process removes the dirt and biofilm layers with water, the universal solvent, then uses water and a light volume of anti-microbial neutral cleaner to disinfect, in combination with microfiber mopping and/or orbital machine or auto scrub options.

Conclusion

Sound flooring specification supports safety in clinical care settings. Efficacy and patient well-being can be improved by weighing the complex interrelationships of criteria during the schematic design phase and selecting resilient flooring appropriate to the applications.

References

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