



TOP DESIGN STRATEGIES

OVERVIEW

Healthcare-associated infections (HAIs) are one of the most challenging issues in healthcare. The selection of appropriate materials and finishes, along with an understanding of cleaning processes, is part of a systems approach to reducing HAIs.

Environmental Surfaces and HAIs Design Strategies

The role of surfaces in contact transmission should not be ignored. A crucial factor in the prevention and reduction of HAIs is maintaining clean surfaces, which requires both the selection of appropriate materials and an understanding of their corresponding cleaning processes. Evidence based on primary research and recommendations from the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), Society for Healthcare Epidemiology of America (SHEA), the Facility Guidelines Institute (FGI), and The Association for Professionals in Infection Control and Epidemiology (APIC), among others, can help guide critical infection prevention decisions in a range of healthcare settings. The following strategies, gathered through a review of the literature, should be considered throughout the material selection and specification stages.

Surface Finishes

- Minimize the number of decorative horizontal surfaces. Opt instead for functionality (e.g., places for medical equipment, patients' personal items, etc.).
- Minimize the variety of materials used in a single space.
- Select and design easy-to-clean surfaces and assemblies (e.g., avoid surface crevices, rough textures, joints, and seams).
- Select non-absorptive, nonporous, and smooth surface materials.
- Use water-resistant materials, sealed-seam construction, and moisture-impervious surfaces where water or moisture is continuously present (e.g., clinical use work surfaces with inset or integral sinks and seamed integral wall, flooring, and/or cove base assemblies) to reduce/eliminate the possibility of seepage within or under the assembly.
- Consider fabric seams and pore size to reduce permeability.
- Consider self-disinfecting materials with intrinsic antimicrobial properties (e.g., copper, silver).
- Avoid carpet in areas with a high infection risk (e.g., ICUs, ORs, burn units).
- Carefully evaluate the use of carpet in high-traffic areas and avoid where spills are most likely to occur (e.g., near sinks, laboratories, etc.).



Choosing Furniture/Furnishings for Ease of Cleaning

- Select furniture that is easily movable (either on wheels or suspended on walls with brackets) or has sufficient clearance (at least 6") to enable cleaning underneath. Alternately, evaluate how furniture and equipment meet floors and adjoining walls, and seal abutments wherever possible.
- Minimize or eliminate upholstered furnishings in high-risk patient areas.
- Select easily removable, washable, and/or replaceable privacy curtains and fabric furniture covers.
- Specify furniture that allows for cleaning between seats/cushions and seat backs.

Cleaning Practices

- Where on-premise laundry facilities are available, ensure separation of clean and dirty functions for the routine cleaning of soft surfaces to limit cross-contamination.
- Understand and define the laundering protocol for fabrics and textiles prior to selection.
- Comply with manufacturer-recommended cleaning and disinfection methodologies to meet CDC and other clinical microbial and sporicidal elimination requirements.
- Determine suitable cleaning processes, taking into account process characteristics (as summarized in the [Tool for Selection of Cleaning Methods](#)), organizational policies, requirements, and capabilities. Newer technologies are not a substitute for recommended cleaning and disinfection procedures. No-touch automated disinfection (NTD) systems should be applied after surfaces have been cleaned of any visible contamination.
- Allocate space for NTD devices to have a clear "line of sight" to critical surfaces in the room during cleaning.
- When a UV system is used for terminal cleaning, select easily movable furniture and equipment (as these will need to be moved away from the wall during cleaning).
- Consider reflective wall coatings when using UV systems to reduce turnover time.

Additional information can be found in the accompanying issue briefs on Contact Transmission (Part 1: The Role of Surfaces in HAIs and Part 2: The Role of Materials, Design, and Cleaning in HAIs).