

Environmental Services

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Prevent Bacterial Growth With Solid-Surface Sinks and Countertops

By Linda Lybert

According to the Centers for Disease Control and Prevention (CDC) as many as 88,000 hospital patients die from nosocomial infections annually. These statistics have created urgency in identifying ways infectious diseases are transmitted. Hospital units where patients with compromised immune systems reside are key areas for research to understand how and why these patients contract deadly illnesses.



Facilities managers and infection control practitioners (ICPs) are aware of how bacteria and mold grow in and on horizontal and vertical surfaces; however, it wasn't until recently that sinks and countertops were studied as potential sites for the spread of disease. There are now several studies documenting the various bacteria that can grow around the rim of the sink and the interior of the sink and drain. There is sufficient evidence that transmission is possible from sinks to hands. When patients, healthcare workers (HCWs) or physicians use the sink to wash their hands, researchers discovered that while they may be cleaning their hands, the bacteria that has been washed from the hands may be deposited around the outside of the sink. When a patient or HCW washes his/her hands he/she might be picking up bacteria from the person who previously used the sink. Despite cleaning the sink with a disinfectant, bacteria may survive around the rim of the basin.

A closer look at the materials used in the manufacture of the countertop and sink helps HCWs understand how this simple structure may play host to bacteria and mold. Most countertops in patient-care areas are laminate with a china set-on sink and set-on back splash. Laminate is actually compressed paper; while it is dense and may appear to be non-absorbent, it is porous and will absorb moisture over time. Countertops and the perimeter of the sink are almost always wet and water will run into the back splash. Where the vertical edge of the sink meets the horizontal surface of the countertop and where the backsplash meets the countertop are perfect sites for growth of bacteria and mold. If caulking around the sink or other seam location deteriorates, water will penetrate into the laminate and the substrate below. The substrate is usually wood or particle board. Wet wood will harbor bacteria, especially *Aspergillus* fungi.

Acceptance of delaminating countertops has been the norm. A crack here or there and a little extra caulk will make the countertop last just a little longer. When it deteriorates enough to be removed, a new laminate countertop replaces the old one and the cycle continues. Countertops and sinks are ideal sites for cross contamination.



In their desire to attract affluent patients, hospital administrators are offering private rooms and luxury suites. VIP areas that resemble luxury hotels are cropping up in healthcare facilities across the country. Following this trend is the design component of high-end tile and glass in patient bathrooms and granite or natural stone for countertops at nursing stations. These upscale components raise infection control issues for several reasons. Natural stone or granite is extremely porous and can harbor bacteria. These surfaces therefore encourage cross contamination when patients and HCWs come into contact with the same sink and countertop area. With tile surfaces, grout and grout lines may harbor bacteria, and in some instances leaking can cause damage to the wall behind the tile if it is not caulked correctly and on a regular basis.

Granite is an underground aquifer for water; as water passes through it, it traps bacteria. So when granite is brought into the hospital it already contains a variety of bacteria. While granite can and should be sealed, it

can only be sealed against moisture absorption. It still has bacteria in it and no one is protected against the release and spreading of microbes. The stone industry has just begun to develop a variety of products to inhibit the growth of bacteria but at this point stone cannot be disinfected.

A solution to these issues is a solid surface. Solid surfaces are more hygienic, in that there are no pores, seams or voids commonly found in laminate, tile, wood and granite. Not only is solid surface nonporous, it is inert like stainless steel. With solid surface, grout lines and open seams are replaced by impermeable, hygienic joints. Sinks can be integral, with a countertop creating one continuous surface without rims, caulk or seams. Back splashes are covered up from the countertop, leaving no seams or voids for water to pool and create an environment for mold and bacteria to grow. Depending on the location, covered back splashes can go high enough up the wall to prevent water from soaking the wall and creating an environment for bacterial growth.

Typically, solid surface comes in quarter-inch and half-inch thicknesses. Some solid surface materials are thinner and applied to a wood or particle substrate. These materials are presented as being less expensive than solid surface; however, the issue is that it is a laminate veneer product and the issues of seams and delaminating are the same as any laminated product. While in the beginning the product appears to be seamless, with sudden impact or temperature variation the two materials will expand and contract at different rates, causing the solid surface to delaminate from the substrate. The same issue applies to laminate with open seams and water getting into the wood or particle board substrate. Some of these laminated products have materials such as fiberglass in them to add strength. This limits HCWs' ability to use certain cleaning agents on them since the fiberglass could be exposed, leaving these areas open as potential sites for bacteria and mold to flourish.

Polyester offers a depth of color no other resin can offer. While polyester is the least expensive resin on the market, it is brittle, highly flammable and emits toxic gas. Maintenance can be an issue; it scratches easily and some cleaning solutions and abrasives cannot be used without damage. It can fade and discolor when exposed to certain kinds of light, and if hit hard, it will shatter. While the upfront cost of polyester may be lower, long-term maintenance can be costly. Solid surface is repairable; however, the challenge with polyester is achieving a repair that is not noticeable. Care needs to be taken when deciding where to put a polyester-type countertop, as flammability and brittleness are a concern. That is why manufacturers of polyester-based solid surfaces have begun to add acrylic to their mixture. While the polyester-acrylic blends helped resolve issues of flammability and added strength to the material, polyester and acrylics molecular structures are not compatible and will break down over time. Acrylic is stronger and is less likely to be damaged in the rigorous healthcare environment.

The cost of solid surface is usually the first issue facility managers face when making decisions about sinks and countertops. Costs incurred with maintenance and the lifecycle of the materials currently used fuels renewed interest in the use of solid surface in many healthcare applications. Infection issues concerning laminate and other porous materials are another good reason to investigate solid surfaces, with cost-savings coming in a variety of ways. The care and maintenance of solid surface in an integrated sink design is much easier than the laminate countertop with set-in sink. It is important for housekeeping staff to be trained on how to clean and maintain the solid surface.

Quarter-inch solid surface is ideal for wall protection and is commonly used for vertical surfaces in operating rooms or in high-traffic areas. Solid surface provides a continuous seamless wall that protects the wall behind the solid surface from damage and does not allow growth of mold and bacteria. Solid surface survives the impacts, nicks and cuts that ruin most wall surfaces and is renewable, repairable and reusable. If the solid surface is damaged it can be repaired onsite, saving labor costs and resources. Regular cleaning and disinfecting of the surface by wiping with a cleaner is important.

Hospitals are now able to buy solid surface direct from manufacturers and in-house staff can be trained to fabricate and install the material. This minimizes additional mark-ups by millwork companies or general contractors. When projects are larger than in-house maintenance or construction staffs can handle, working with an experienced fabricator directly will minimize cost. Material is discounted based on volume, and healthcare facilities can reap substantial cost savings. The option of leasing or paying for solid surface over a longer time period is an option that lowers upfront costs. The lifecycle cost of solid surface typically will justify the higher upfront costs. Solid surface is reusable so continually purchasing material to replace old material is not necessary. If an area is renovated, facility managers can reuse the existing



material by making simple repairs or adding more material. While warranties vary, some solid surface companies will guarantee the material against any damage for 10 years.

Nosocomial infections are costing hospitals billions of dollars annually. Lives are lost daily due to the spread of infection in healthcare facilities. The use of solid surface in patient-care areas can eliminate one more potential site for cross contamination and the spread of infections.

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