Open Plan

Sharing Desks, Sharing Germs

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We've all been there, and it's sickening—sitting in an airplane, theater or meeting next to someone who is coughing and sneezing. Germs are a fact of life, but most of us would rather avoid close contact with people who are ill. It's much easier to stay away from sick people, however, than to stay away from their germs.

Germs are loiterers. They can live and thrive on all kinds of surfaces, including—and especially—desks in the workplace. Desktops are among the worst germ traps, says University of Arizona germ guru Dr. Charles Gerba. According to his research, office workers' hands come in contact with 10 million bacteria a day. Crumbs that accumulate on desks are a perfect environment for bacteria and fungi to thrive, agrees Dr. Ron Cutler, a microbiologist at Queen Mary University of London.

- **37%** of the workforce is expected to be mobile by 2015
- workers' hands come in contact with **10 million** bacteria a day
- **80%** of infections can be transmitted by touch
- **4,000** germs per square inch on cellphones

This is especially concerning because more people than ever report that they go to work despite being sick—up to 72%, according to a recent Lancaster University/Elise Insurance study—and 80% of infections can be transmitted by touch, states the WebMD website.

"The transition from assigned 'I spaces' to shared 'we spaces' globally has created opportunity for the intelligent, strategic use of antimicrobials in support of wellbeing."

Of course, not all bacteria are harmful. In fact, most aren't. Humans host about 100 trillion species every day, and many are essential for keeping us alive and healthy. Scientists at places such as the BioFrontiers Institute at the University of Colorado in Boulder are now researching human-associated microbiota in depth, hoping to learn more about their role in human health.

At the same time, some bacteria are known to be pathogens that produce illness. It's also a fact that, as knowledge work becomes more collaborative and mobile, many office environments are evolving to become mostly shared "we" spaces versus individually assigned work settings. Because more workers than ever are moving through shared workstations, research suggests an increasing need to reduce harmful germs.

By 2015, 37.2% of the workforce is expected to be mobile, according to the International Data Corporation. "When we're sharing desks, we're sharing germs," says Michael Taylor, a Steelcase WorkSpace Futures researcher who has been investigating germs in shared environments during the past several years. "While hand washing and surface cleanings are valid approaches to minimizing germs in the workplace, we also know that typically these actions and behaviors don't happen with enough frequency to be effective. As a result, in shared spaces where people come and go—such as shared workspaces for mobile workers, classrooms, waiting rooms and cafés—we are leaving our mark behind in the form of germs and bacteria."

Observations as well as research data confirm this unpleasant reality, Taylor adds. For example, he cites a 2012 study of Americans' hand-washing habits conducted by KRC Research, which revealed that 39% don't wash their hands after sneezing, coughing or blowing their noses.

The most common way for germs and infections to spread is person-to-person—touching hands, sneezing, coughing, etc. Germs can also be spread by indirect contact—touching an object where germs can linger. "When you touch a doorknob handled by someone ill with the flu or a cold, for example, you can pick up the germs he or she left behind. If you then touch your eyes, mouth or nose before washing your hands, you may become infected," warns the Mayo Clinic website.

As a result of these realities, antimicrobial agents—i.e., technologies that either kill or slow the growth of microbes—are gaining relevance in the workplace as an option to reduce germs on frequently touched surfaces.

ANTIMICROBIALS AT WORK

A range of antimicrobial technologies is available in a variety of consumable and durable products today, from household cleaners and toothpaste to clothing and toys. Antimicrobials are generally thought of as chemicals, but they can include naturally derived compounds and surface textures, as well. They affect microorganisms by inhibiting or altering cell activities, such as protein synthesis and cell membrane functions.

As research accelerates, knowledge on antimicrobials and their impacts is rapidly expanding and changing. Among the array of antimicrobial options, several have potential for work environments.

Metal and metal ions. Silver and copper have a long history as antimicrobials, as evidenced by Greek, Egyptian and Roman accounts as far back as 2200 BC. Both metals were used to store and treat drinking water, and also made into antiseptic salve. The antimicrobial action for both elements is in the ionic form and can act in multiple ways. Widely embraced as a natural and effective antimicrobial, silver is typically applied by adding silver ions, which incorporate chemical additives, to a carrier material, such as clay, which is in turn added to the base material. Copper is used in both the raw metallic form and as oxides added to base materials.

Botanical-based extracts. Many essential oils found in plants possess some level of antimicrobial action. Studies have shown that they attack microbes by making the cell membranes permeable. Bay, cinnamon, clove and thyme have been identified as the most potent types. The use of extracts in consumable products such as cleaners and wipes is well established, and the transition to durable material such as plastics is underway.

Surface topography. Certain surface topographies have been borrowed from nature as nonchemical antimicrobials. One of particular interest is Sharklet®, a surface comprised of millions of microscopic diamonds arranged into a distinct texture based on natural shark skin. Instead of killing microbes, the surface creates an inhospitable environment that inhibits their colonization.

“Antimicrobials show promise as another way to proactively create health-conscious work environments”

IMPORTANT CONSIDERATIONS

The use of antimicrobials can be challenging from a materials chemistry standpoint. That’s why it’s important to make choices about when, how and where to use antimicrobials, considering these factors:

Application. Selecting and applying an antimicrobial is a balancing act between the base materials, how they are processed and formed, the desired effectiveness and durability of the antimicrobial, and the ultimate product performance. Some technologies are added into the base material, others are applied as post-production sprays or coatings. These application methods, in turn, present lifecycle choices around managing the materials during application, in use and at end-of-life.

Amount. It’s easy to think that the objective of using an antimicrobial is to obliterate everything on a surface. Indiscriminate mass elimination of microbes, however, is unnecessary and even potentially harmful. As Dr. Michael Schmidt, professor and vice chairman of microbiology and immunology at Medical University of South Carolina, explains, the goal of deploying antimicrobial materials into the built environment is to lower the bio-load to a level at which the body can fight it off on its own.

Probability of touch. Some parts of workplace products are touched more frequently than others and this, in turn, creates higher bio-loads, which can increase the possibility of coming in contact with harmful germs. Applying antimicrobials only to the areas of the product that are touched most frequently—versus coating an entire product—is a balanced approach.

Fact-based information. Antimicrobials are regulated by governmental organizations around the world. While different countries have different standards, most require that antimicrobials be registered and control the type of claims that can be made for a specific technology and/or application. Pro and con attitudes toward antimicrobials can be extreme and misperceptions about user behaviors abound, so it’s important to rely on fact-based information versus assumptions or hype when making decisions about their use.

EXPLORING SOLUTIONS

Based on insights into the changing nature of work, Steelcase has been exploring antimicrobials for furniture products as an option for employers who want to take extra steps to reduce germs in the workplace. “By reducing germs on surfaces, antimicrobials can create more health-conscious environments,” notes Steve Sanders, Steelcase general manager of the furniture group.

The goal, says Sanders, is to develop a suite of antimicrobial technologies that are safe and effective, providing more options for customers. A new desking system, Ology, will be the first Steelcase product that offers customers the option of antimicrobial surface components. Available in Europe in 2014, the product line will include an antimicrobial option for several frequently-touched surface components: the worksurface edge and desk pad, height-adjustment controls, and power and data access points. Steelcase has partnered with a leading innovator in antimicrobials, NanoBioMatters, to develop use of its BactiBlock® antimicrobial technology for Ology. The active ingredient is ionic sliver. BactiBlock is a molded-in antimicrobial.

To further address user needs, collaboration is also underway with CleanWell, a botanical-based disinfectant company, and Sharklet Technologies, a biotechnology company exploring surface technologies, including Sharklet. The collaboration with Sharklet Technologies is industry-exclusive.

PROACTIVE PREVENTION

With more workers spending more time in the workplace and moving about throughout the workday, reducing germs is a growing concern. Antimicrobials show promise as another way to proactively create health-conscious work environments in support of improved worker wellbeing. Although antimicrobial materials should not replace or decrease regular cleaning routines or good hygiene practices (e.g. hand washing, coughing into elbows, staying home when sick), they can add another level of potential benefit by reducing germs in the workplace.

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