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The Importance of Surface Disinfection and Hand Hygiene in Healthcare Facilities

Here are ways to overcome some of the challenges

The COVID-19 pandemic has led to unprecedented challenges for healthcare facilities, and it has further underscored the need to maintain the highest levels of hygiene and cleanliness. The key to reducing the spread of germs is understanding how they are transmitted and how to break the cycle of transmission. Two tools are crucial for accomplishing this: surface disinfection and hand hygiene.

It's about touch

Germs are spread in a multitude of ways – from person-to-person or from surfaces-to-person.[1,2] Adults touch their faces approximately 15 times an hour and about 360 times in a 24-period.[3] And research has shown that people can touch surfaces an average of 301 times in an hour and up to 3,600 times in 12 hours.[4] If you think about a community of 20 people interacting with a dozen or more staff over the course of a day in a healthcare facility, you can imagine how that web can build. For bacteria to spread, all it takes is for someone to touch a contaminated surface and then touch his or her cell phone, check an IV bag, write in a chart, touch the control screen on a computer and type in data.

For example:

A 2007 study found that frequently touched surfaces are easily contaminated. The most frequently contaminated surfaces were door handles, pens, light switches, TV remote controls and faucets.[5]

A 2015 study in the American Journal of Infection Control found that bacteria could be transferred between devices frequently utilized by healthcare workers, such as cell phones and pens, and spread to other surfaces as a result.[6] The study found that the highest potential for transfer is for metal followed by plastic.[7] It concluded that healthcare workers should be educated about refraining from touching surfaces or cell phones after or during patient contact, adding that *"these observations point to the need to define behaviors that reduce the likelihood of hand- and surface-mediated germ transmission in high-traffic areas of both clinical and long-term care facilities."* [8]

What are the most effective ways to reduce the spread of germs? It all comes down to surface disinfection and hand hygiene. This paper outlines ways to maximize both to greatly reduce the spread of germs and break the cycle of germ transmission in high-traffic and common areas in a healthcare facility.

Surface disinfection principles

To ensure proper surface disinfection, it's essential to understand the distinctions between different methods and their effectiveness. It's also essential to understand the differences between cleaning, sanitizing and disinfecting.

The differences between cleaning, sanitizing and disinfecting

Cleaning

removes germs, dirt and impurities from surfaces or objects — it does not kill germs.

Sanitizing

uses chemicals to reduce microorganisms from the inanimate environment to levels considered safe, as determined by public health codes or regulation.

Disinfecting

kills germs on surfaces or objects by using chemicals but does not necessarily clean dirty surfaces or remove germs.

Antimicrobial agents are disinfectants that kill or slow the spread of microorganisms including bacteria.[9] Antimicrobial agents are used on surfaces or non-living things and include wipes for kitchens, bathrooms and hospitals. Hand-sanitizing wipes, are used on the skin.

The U.S. Centers for Disease Control and Prevention (CDC) defines a broad spectrum disinfectant as one that should have a wide antimicrobial spectrum, is fast acting, not affected by environmental factors, such as organic matter, and compatible with soaps, detergents, and other chemicals encountered in use.[10] Surface sanitizers reduce the number of bacteria contaminants to safer levels.

Disinfectant chemistries

Factors that impact performance of all disinfectants are: [11] [12] [13]

- Concentration
- Active ingredients
- Time of exposure (contact time)
- Method of application (wipes, sprays, rags and bucket)
- Temperature
- pH
- Organic matter

The success of environmental surface disinfection is affected by cleaning procedures; use of appropriate tools; the volume and concentration of disinfectant applied to surfaces; disinfectant interaction with wipes, towels and mops; and, most of all, remembering to do it.

When working with your teams, it's important to remind them about guiding principles for the use of disinfectants for environmental surfaces:

- Select disinfectants that are suitable for the intended use and use in accordance with label instructions.
- Clean and disinfect high-touch areas.
- Avoid methods that produce mist or disperse dust.
- Clean mop heads and cloths after use and allow to dry before reuse.

How to disinfect surfaces

When disinfecting a surface in a healthcare facility, the first step is to read the label for the disinfectant. This will ensure that you select the right tool for the task. It also will help you identify the active ingredients, dilution instructions, recommended methods of application and contact time. The next step is to apply the disinfectant, making sure it covers the entire area and that it stays on for the required length of time. It is better to let the surface air dry vs. wiping it dry.[14]

Surface antimicrobial wipes

Antimicrobials are commonly applied to a surface by two divergent methods: spraying or wiping. Users that apply spray products tend to combine wiping after spraying, adding some complexity to the process. Wiping also is the best way to make sure the entire surface is treated. Wipes help reduce the risk of incomplete coverage as compared to sprays.

Disinfection wipe products come in two forms. Either a solution is added to a wipe, or a wipe is pre-saturated with an antimicrobial solution. Regardless of the product form or method of application, for a product to be most effective a uniform coating should be applied to the entire surface. Therefore, it is important to understand how the disinfectant is applied. The remainder of this section focuses on the role a wipe plays in disinfecting surfaces. [15 16 17]

When it comes to wiping to deliver the antimicrobial, there are several options to choose from:

Paper towels, which contain wood pulp

Non-woven wipes

- Polymer-based towels:
  - Meltblown, Spunbond, Microfiber
- Mixed fiber wipes, which contain wood pulp and polymer:
  - Hydroknit, Coform

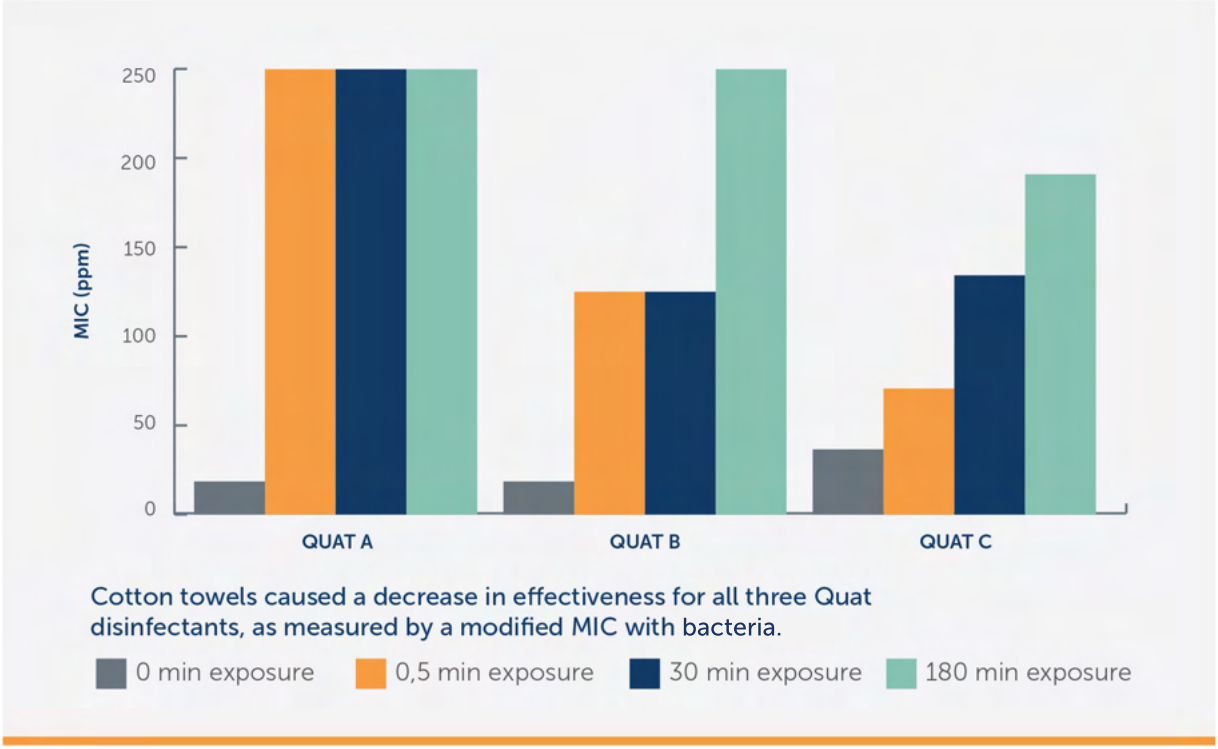
Woven towels, which contain cotton

If you use a disinfectant system that adds the disinfectant to the wipe, it's essential to make sure you use the right wiping material – one that is compatible with the disinfectants. Research has shown that the wiping material you use can dramatically affect the amount of disinfecting agent that reaches the surface being cleaned. A prime example: Quaternary Ammonium Compounds (aka Quats). Quats are attracted to and absorbed into fabrics, such as cotton towels.

A 2013 study in the American Journal of Infection Control found that cotton towels may reduce the effectiveness or even inactivate the ability of Quats to disinfect surfaces.[18] The study found that laundered cotton towels soak up and hold disinfectant so that it doesn't reach the surface at the recommended concentration level. As a result, cotton towels were found to reduce the disinfection strength of Quat-based disinfectants by up to 85%.

You can see the degree to which cotton has been found to decrease Quat effectiveness in the chart below. [19]

Cotton decreases Quat effectiveness



A 2014 study found that reusable cotton towels may be a reservoir for live bacteria,[20] via the soak buckets containing the Quat disinfectants.

In addition, hospital laundering practices were found to be insufficient for removing microbial contaminants and may even add contaminants to the towels. These findings demonstrate that the type of wiping material used to disinfect surfaces can potentially interfere with the action of commonly used disinfectants and increase the risk for germ transmission in the hospital.[21]

Therefore, to optimize cleaning and hygiene practices it's essential to choose the right type of wipe – one that is compatible with quaternary amine disinfectants – along with the right cleaning delivery system. The combination of a non-woven wipe with a closed bucket system was found to outperform an open-bucket system with three different types of wipes: reusable cotton, microfiber, and disposable cellulose-based wipes. Another benefit to a closed bucket system is that it helps to avoid contamination of wipes and the cleaning solution because it eliminates any opportunity to re-dip wipes into an open bucket.[22]

"Hands are the main pathways of germ transmission during health care. **Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs."**

World Health Organization (WHO)[23]

Hand hygiene

The importance of hand hygiene in preventing the spread of germs is a well-established principle. Following proper hand hygiene protocols for washing and drying are key. The issue almost always comes down to compliance. How compliant are your staff members? One study found that perceptions and expectations of hand hygiene compliance and actual compliance varied greatly, with actual compliance between 15 and 40 percent and expectations/self-perception ranging from 60 to 95 percent.[24]

Hand washing protocols

To help reduce cross contamination and the spread of germs, it is recommended by the U.S. CDC that workers use soap and water or hand sanitizer that contains at least 60 percent alcohol.[25] (This content does not supersede any requirements to meet local regulations. Please check with your legal and regulatory advisor regarding the requirements you need to meet.) Alcohol-based hand sanitizers can quickly reduce the number of microbes on hands in some situations, but sanitizers do not eliminate all types of germs.

It is also important to use hand sanitizers correctly by applying the product to the palm of one hand (reading the label to determine the correct amount) and rubbing hands together. **Make sure to rub the product over all surfaces of your hands and fingers until your hands are dry.**

Steps for proper hand sanitizing

Total time: 20-30 seconds

Steps for proper hand washing

Total time: 60 seconds

How you dry your hands matters

After washing hands properly, it's also essential to ensure that they are dried correctly. **Single-use paper towels offer an effective and hygienic option for hand drying[26].**

Here are a few facts to consider:

- Paper towels are critical to proper hand hygiene, as they can remove up to 77% of the bacteria that remains on hands after washing.[27]
- The World Health Organization (WHO) recommends single-use paper towels in its handwashing guidelines for healthcare workers.[28]
- Jet air dryers blow water droplets that could contain bacteria from the hands as far as 6.5 feet and linger in the air for up to 15 minutes.[29]
- Jet air dryers can actually increase bacteria by 42% on users' fingers during the drying process.[30]

Paper towels – particularly roll towel systems – not only enhance hygiene by ensuring that you touch only the sheet that you need, they also can enhance efficiency and productivity. These high-capacity systems reduce the risk of product run-out, providing cleaning staff with more time to focus on other tasks.

Hand hygiene can save lives. The barriers to hand hygiene compliance include belief, process and environmental obstacles, such as inadequate sinks or location of hand sanitizer dispensers. **There are, however, ways to overcome them, including:**

Education and knowledge

Product selection tailored for hand hygiene compliance

Product availability and placement in the workplace

Staff empowerment

Real-time feedback

Leadership commitment

Conclusion

What this and other studies cited in this paper demonstrate is that building a comprehensive hand hygiene and surface disinfection program can produce real results. And that education translates into improved behavior in everyday life. By adopting best practices for hand hygiene and surface disinfection, you can make tremendous strides in enhancing hygiene and cleanliness and reducing the spread of germs in your facility.

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