

COMBATING COMMUNITY-ACQUIRED MRSA

A white paper on the role of facility maintenance on reducing the spread of Methicillin-resistant Staphylococcus aureus (MRSA)

CA-MRSA, or community-acquired methicillin-resistant Staphylococcus aureus is primarily spread by skin-to-skin contact.¹ There are five commonly referenced factors that make it easier for MRSA to be spread.² Those factors are:

- Crowding
- Frequent skin-to-skin Contact
- Compromised Skin (cuts or abrasions)
- Contaminated items and surfaces
- Lack of Cleanliness

The Centers for Disease Control provides four basic ways to secure protection from contracting MRSA:

- Practice good hygiene.
- Cover skin trauma (cuts and abrasions).
- Avoid sharing personal items (towels, razors) and use barrier (towel) between skin and shared equipment.
- Maintain a clean environment by establishing cleaning procedures for frequently touched surfaces and surfaces that come in to direct contact with people's skin.

The cleaning and maintenance industry can address two of these areas by providing adequate hand washing products and assuring surfaces are free from MRSA bacteria.

Since MRSA bacteria can live on a non-porous surface for up to 12 days³, it is important to use a cleaning technique that will adequately eliminate it and return surfaces to safe levels.

Surface Disinfecting Procedures for MRSA

Cleaning professionals need to be aware of three important factors when cleaning a surface to be MRSA-free.

1. Make sure the surface is adequately prepared for the disinfection process.
2. Use an EPA-registered disinfectant that clearly states effectiveness against MRSA.
3. Allow the disinfectant to dwell on the surface for the amount of time indicated on the label.

First, the surface needs to be adequately prepared for the disinfection process to be successful. In other words, it needs to be cleaned properly so it is free of organic soil that can interfere with the kill efficacy. Even surfaces that appear clean to the naked eye often harbor enough organic soil to interfere with the disinfection process.⁷

Not all disinfectants are EPA registered for MRSA effectiveness⁴. A product that is effective against Meticillin-resistant *Staphylococcus aureus* (MRSA) will have this bacteria listed on its label.

It is imperative that the disinfectant is allowed to dwell on the surface for the amount of time suggested by the manufacturer. This is perhaps the most common mistake that end-users make when using a disinfectant or sanitizer.

One-Step vs. Two Step Disinfecting

The EPA registers two types of disinfectants. A "one-step" cleaner/disinfectant is designed to perform on surfaces that are "mildly" soiled.⁵ The more traditional disinfectant relies on a surface that has been previously cleaned of all organic soil.

To be registered as a "one-step" cleaner-disinfectant, a product must perform the required kill levels in the presence of organic soil. The test used contaminates the surface with 5% blood serum to mimic organic soil found on cleaning surfaces. The EPA cautions when using a one-step product if the surface is heavily soiled, that a 'cleaning step must be recommended

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prior to application of the antimicrobial agent.¹⁵ Also, as with any sanitizer or disinfectant, a dwell time (or sit time) still applies to reach the full registered kill.

In real world situations, it can be difficult to place the responsibility to determine what degree of organic soil equals 5% blood serum on a busy custodian who is already pressed to cover a lot of ground in a short time.

The real problem emerges if the surface exceeds the threshold of organic soil, as the kill efficacy will be compromised.

Two-step disinfecting leaves no question regarding the surface's preparation, thus allowing for maximum disinfecting performance. Using a cleaner such as hydrogen peroxide-based H₂Orange₂ Concentrate 117 in its heavy-duty dilution assures the surface is free from all organic soil as well as detergent residue that traditional detergent based cleaners can create.

If the user allows this dilution of H₂Orange₂ 117 to dwell for five minutes, the surface is also free of common bacteria such as Staphylococcus aureus, Salmonella choleraesuis, Klebsiella pneumoniae, Pseudomonas aeruginosa, Streptococcus faecalis, and Escherichia coli.

When a disinfectant is then applied to the clean surface, there is no doubt regarding its effectiveness in killing MRSA when left to dwell for the proper amount of time.

Overall vs. Touch Point Disinfection

There is no evidence to support the idea that overall disinfection is needed to address a MRSA outbreak. The CDC recommends that "cleaning and disinfection should be performed on surfaces that are likely to contact uncovered or poorly covered infections."²

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All states with Department of Health MRSA guidelines recommend the disinfection of "shared surfaces" or "surfaces likely to be in contact with open skin."⁶ These "high touch" points include door knobs, push plates; toilet, urinal, sink & water fountain handles; toilet seats; push points or levers on soap and towel dispensers; table tops and desk tops used by multiple people; wrestling mats; locker room surfaces; exercise equipment and sports equipment such as helmets and pads.

Many experts caution against the use of disinfectants on surfaces that are not commonly touched by bare skin such as floors. MRSA exists, in part, because *Staphylococcus aureus* bacteria have been overexposed to antibiotics and disinfectants, allowing it to adapt and build up immunity.⁸

Also, quaternary disinfectants often leave a sticky residue behind if not rinsed. When used for mopping floors, any residue left behind can contribute to the development of a sticky "bio-film" that can harbor bacteria. **Use of disinfectants should be reserved for surfaces that are likely to be contacted regularly by human skin.**^{2,7}

From an economic standpoint and a healthcare standpoint, it makes sense to use the higher priced disinfectant on the high touch points instead of the entire facility.

Environmentally Preferable Products and MRSA

When addressing MRSA, there are environmentally preferred products that are alternatives to traditional harsh disinfectants. The Healthy Schools Campaign points out that using green cleaning products prevents the spread of infection without exposing children to unnecessary levels of harsh chemicals that can reduce indoor air quality, burden the immune system and aggravate respiratory problems such as asthma.⁸

EnvirOx, LLC in Danville, Illinois developed hydrogen peroxide cleaning technology and has been a forerunner in the development of environmentally preferred cleaning products.

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Hydrogen peroxide-based H₂Orange₂ Concentrate 117 Multi-purpose Cleaner-Sanitizer-Virucide-HBV cleans and prepares surfaces for disinfection. It also kills 99.99% of common bacteria (including staphylococcus aureus) and 99.9% of specified viruses, including HIV and Hepatitis B.

This patented, hydrogen peroxide formulation does not leave behind any detergent residue on surfaces that can create sticky bio-film.

The company offers Critical Care™ Disinfectant-Fungicide-Virucide, an environmentally preferred disinfectant that delivers a two-minute MRSA kill, yet is virtually odorless. This product is made with silver ion technology, and provides a residual 24-hour kill on common bacteria, including Staphylococcus aureus.

Conclusions:

1. MRSA is spread primarily by skin-to-skin contact, but facility managers can help control the spread with a consistent cleaning procedure.
2. It is important to use an EPA-registered disinfectant that clearly states effectiveness on MRSA, allow it to dwell for the suggested amount of time, and apply it to a surface that is properly pre-cleaned.
3. Although one-step disinfectants exist, it is difficult to judge if a surface's degree of organic soil is equal to or less than 5% blood serum, which is the threshold for a one-step disinfectant to perform.
4. Only a two-step disinfection procedure (clean first, then apply disinfectant) leaves no doubt as to the effectiveness of the disinfectant and elimination of MRSA.

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5. It is irresponsible and wasteful to use a disinfectant on all surfaces of a facility. Only touch-points or shared surfaces in a facility need to be treated with a disinfectant to prevent the spread of MRSA.
6. Many believe a contributing factor in the creation of MRSA is the overuse of disinfectants. Like any tool, thoughtful and conservative application of disinfectants, where and as needed, is prudent to avoid creating other problems while attempting to manage this one.
7. Environmentally preferred products are available for cleaning, sanitizing and disinfecting. Using green products prevents exposure to unnecessary levels of harsh chemicals.

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