

MRSA has been featured in the news and on television programs a great deal recently. The acronym stands for methicillin-resistant *Staphylococcus aureus*, a type of staph bacteria that, as the name suggests, causes infections that are resistant to the usual antibiotic treatments.

MRSA occurs most frequently among patients who undergo invasive medical procedures or who have weakened immune systems and are being treated in hospitals and healthcare facilities, such as nursing homes and dialysis centers. It is in healthcare settings that MRSA causes the most serious and potentially life-threatening infections, such as bloodstream infections, surgical site infections and pneumonia.

MRSA can also infect people in the community at large, generally manifesting as skin infections that may look like pimples or boils and can be swollen, painful and have draining pus. These skin infections often occur in otherwise healthy people.

How MRSA Spreads in Healthcare Settings

When we talk about the spread of an infection, we talk about *sources* of infection (i.e., where it starts) and the *mode* or *modes of transmission* (i.e., way or ways it spreads). In the case of MRSA, patients who already have a MRSA infection or who carry the bacteria on their bodies but do not have symptoms (are colonized) are the most common sources of transmission.

The main mode of transmission to other patients is the human hand, especially healthcare workers' hands. Hands may become contaminated with MRSA bacteria by contact with infected or colonized patients. If appropriate hand hygiene, such as washing with soap and water or using an alcohol-based hand sanitizer, is not performed, bacteria can be spread when the healthcare worker touches other patients or surfaces that may in turn be touched by another patient.

MRSA and the Expensive Results of Antimicrobial Resistance

Along with MRSA, many other significant

infection-causing bacteria are becoming resistant to the most commonly prescribed antimicrobial treatments. What causes this, and what does it mean?

Antimicrobial resistance occurs when bacteria change or adapt in a way that allows them to survive in the presence of antibiotics designed to kill them. In some cases, bacteria become so resistant that no available antibiotics are effective against them. At this time, treatment options still exist for healthcare-associated MRSA.



People infected with antibiotic-resistant organisms such as MRSA are more likely to have longer and more expensive hospital stays and may be more likely to die as a

result of the infection. When the drug of choice for treating their infection doesn't work, they require treatment with second- or third-choice medicines that may be less effective, more toxic and more expensive.

MRSA: a Growing Problem in the Healthcare Setting, but One with a Cure

MRSA is becoming more prevalent in healthcare settings. According to CDC data, the proportion of infections that are antimicrobial-resistant has been growing. In 1974, MRSA infections accounted for two percent of the total number of staph infections; in 1995 it was 22%; in 2004 it was 63%.

The good news is that the spread of MRSA is largely preventable, and the first step is to prevent healthcare infections in general. Infection control guidelines produced by the CDC and the Healthcare Infection Control and Prevention Advisory Committee (HICPAC) are central to the prevention and control of infections and, ultimately, MRSA in healthcare settings.

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Infection Control

Standard Precautions

1) Hand hygiene. Perform hand hygiene after touching blood, body fluids, secretions, excretions and contaminated items, whether or not gloves are worn. Perform hand hygiene immediately after gloves are removed, between patient contacts, and when otherwise indicated to avoid transfer of microorganisms to other patients or environments. When hands are visibly soiled with blood or other body fluids, wash them with soap and warm water. It may be necessary to

perform hand hygiene between tasks and procedures on the same patient to prevent cross-contamination of different body sites.



2) Gloving. Wear gloves (clean non-sterile gloves are adequate) when it can be reasonably anticipated that contact with blood



or other potentially infectious materials, mucous membranes, non-intact skin or potentially contaminated intact skin (e.g., of a patient incontinent of stool or urine) could occur. Remove gloves after contact with a patient and/or the surrounding environment (including medical equipment) using the proper technique to prevent hand contamination. Do not wear the same pair of gloves for the care of more than one patient. Do not wash gloves for the purpose of re-use; this practice has been associated with transmission of pathogens.

3) Mouth, nose, eye protection. Use personal protective equipment (PPE) to protect the mucous membranes of the eyes, nose and mouth during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions and excretions. Select masks, goggles, face shields and combinations of each appropriate for the task being performed.

4) Gowning. Wear a gown appropriate to the task to protect skin and prevent soiling or contamination of clothing during

procedures and patient-care activities when contact with blood, body fluids, secretions or excretions is anticipated.

- 5) **Appropriate handling of patient-care equipment and instruments/devices.** Handle used patient-care equipment soiled with blood, body fluids, secretions and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other patients and environments. Ensure that re-usable equipment is not used for the care of another patient until it has been appropriately cleaned and re-processed and that single-use items are properly discarded. Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (bed rails, over-bed tables) and frequently touched surfaces in the patient care environment (door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule than that for other surfaces (horizontal surfaces in waiting rooms).
- 6) **Appropriate handling of laundry.** Handle, transport and process used linen to avoid contamination of air, surfaces and persons.

Contact Precautions

Contact Precautions outlined by the CDC should be followed for some patients. To determine if a patient needs to be placed on Contact Precautions see page 37 of *Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006, Centers for Disease Control and Prevention*.

- 1) **Patient placement. In-patient placement in hospitals and long-term care facilities (LTCF).** When single-patient rooms are available, assign priority for these rooms to patients with known or suspected MRSA colonization or infection. Give highest priority to those patients who have conditions that may facilitate transmission; e.g., uncontained secretions or excretions. When single-patient rooms are not available, cohort patients with the same MRSA in the same room or patient-care area. When cohorting patients with the same MRSA is not possible, place MRSA patients in rooms with patients who are at low risk for acquisition of MRSA and associated adverse outcomes from infection and whose hospital stays are likely to be short.

In general, in all types of healthcare facilities, it is best to place patients requiring Contact Precautions in a single-patient room. To assist with decision-making about patient placement in various types of healthcare facilities see page 84 of *Preventing Transmission of Infectious Agents in Healthcare Settings 2007, CDC*.

- 2) **Gloving.** Wear gloves whenever touching the patient's intact skin or surfaces and articles in close proximity to the patient (e.g., medical equipment, bed rails). Don gloves upon entry into the room or cubicle.
- 3) **Gowning.** Don gown upon entry into the room or cubicle. Remove gown and observe hand hygiene before leaving the patient-care environment. After gown removal, ensure that clothing and skin do not contact potentially contaminated surfaces that could result in possible transfer of microorganisms to other patients or surfaces.
- 4) **Patient transport.** In acute-care hospitals and long-term care and other residential settings, limit transport and movement of patients outside of the room to medically necessary purposes. When transport or movement in any healthcare setting is necessary, ensure that infected or colonized areas of the patient's body are contained and covered. Remove and dispose of contaminated PPE and perform hand hygiene prior to transporting patients on Contact Precautions. Don clean PPE to handle the patient at the transport destination.
- 5) **Patient-care equipment and instruments/devices.** In acute-care hospitals and long-term care and other residential settings, use disposable non-critical patient-care equipment (e.g., blood pressure cuffs) or implement patient-dedicated use of such equipment. If common use of equipment for multiple patients is unavoidable, clean and disinfect such equipment before use on another patient.

In-home care settings limit the amount of non-disposable patient-care equipment brought into the home of patients on Contact Precautions. Whenever possible, leave patient-care equipment in the home until discharge from home care services. If non-critical patient-care equipment (e.g., stethoscope) cannot remain in the home, clean and disinfect

items before taking them from the home using a low- to intermediate-level disinfectant. Alternatively, place contaminated reusable items in a plastic bag for transport.



Contact Information

For additional information please contact:

Bob Lombard
Sr. Vice President & Regional Director
Willis Pooling Practice
1755 E. Plumb Lane, Suite #269
Reno, NV 89502
775 323 1656 ext. 19 (Office)
775 858 6335 (Cell)
lombard_bj@willis.com

6) Environmental measures. Ensure that rooms of patients on Contact Precautions are prioritized for frequent cleaning and disinfection (at least daily) with a focus on frequently touched surfaces (e.g., bed rails, over-bed table, bedside commode, lavatory surfaces in patient bathrooms, doorknobs) and equipment in the immediate vicinity of the patient.

7) Discontinuation of Contact Precautions. No recommendation can be made regarding when to discontinue Contact Precautions.

For more information contact Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, US Tel: 404 639 3311 / Public Inquiries: 404 639 3534 / 800 311 3435 http://www.cdc.gov/ncidod/dhqp/ar_mrsa.html

Source: Centers for Disease Control and Prevention Healthcare-Associated Methicillin-Resistant *Staphylococcus aureus* (HA-MRSA)

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