



Methicillin-resistant

Staphylococcus aureus (MRSA)



General Information

Staphylococcus aureus are Gram-positive cocci that are the common cause of skin infections in the community. Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of *Staphylococcus aureus* bacteria that is resistant to certain antibiotics called beta-lactams. These antibiotics include methicillin and other more common antibiotics such as oxacillin, penicillin, and amoxicillin. Severe or potentially life threatening MRSA infections occur most frequently among patients in healthcare settings. While 25% to 30% of people are colonized* with staph, less than 2% are colonized with MRSA.

**When a person carries the organism/bacteria but shows no clinical signs or symptoms of infection. For S. aureus the most common body site colonized is the nose.*

Symptoms

Recognizing the signs and receiving treatment for MRSA skin infections in the early stages reduces the chances of the infection becoming severe.

Severe Infections: MRSA in healthcare settings usually causes more severe and potentially life threatening infections, such as bloodstream infections, surgical site infections, or pneumonia. The signs and symptoms will vary by the type and stage of the infection.

Skin Infections: In the community, most MRSA infections are skin infections that may appear as pustules or boils which often are red, swollen, painful, or have pus or other drainage. At first, they often look like spider bites or bumps that are red, swollen, and painful. These skin infections commonly occur at sites of visible skin trauma, such as cuts and abrasions, and areas of the body covered by hair (e.g., back of neck, groin, buttock, armpit, beard area of men).

Preventing the Spread of MRSA in Healthcare Settings Standard Precautions:

The main principal in standard precautions is to treat all patients as if they are colonized or infected. Healthcare personnel should use some or all of the methods/equipment listed below to protect themselves, their colleagues, and other patients at the facility. These include; hand hygiene, use of personal protective equipment (PPE) including gloves, mouth, nose, and eye \



protection and gowns, appropriate handling of patient care equipment and medical devices and instruments, and cautious handling of soiled linens.

Contact Precautions: Contact precautions are recommended when the facility deems MRSA to be of special clinical and epidemiologic significance. The components of contact precautions may be adapted for use in non-hospital healthcare facilities, especially if the patient has draining wounds or difficulty controlling body fluids.

- 1) Placement: Single room or cohort patients with the same MRSA in the same room or patient-care area.
- 2) Gloving: Wear gloves whenever touching the patient's 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.
- 4) Transport: Limit transport and movement of patients outside of the room to medically-necessary purposes.
- 5) Patient-care equipment and instruments/devices: Use disposable noncritical 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.
- 6) Environmental measures: Ensure that rooms of patients on "Contact Precautions" are prioritized for frequent cleaning and disinfection (e.g., at least daily) with a focus on frequently-touched surfaces (e.g., bed rails, overbed table, bedside commode, lavatory surfaces in patient bathrooms, doorknobs) and equipment in the immediate vicinity of the patient.

People at Risk of Acquiring MRSA Infections

Historically, MRSA infections occurred in hospitalized patients (HA-MRSA), but now these infections are also common in the community (CA-MRSA). The biggest risk factor for MRSA infection is open or broken skin; however, MRSA infections can occur even on areas of the skin where there is no obvious wound or break in the skin.



Patients in Healthcare Settings

Patients in healthcare facilities have weakened immune systems and undergo procedures (such as surgery) or have catheters inserted into the skin that make it easier for MRSA to gain entry into the body. It is for this reason that healthcare personnel must follow infection control procedures (such as hand hygiene and proper catheter care) to prevent the spread of MRSA infections. When patients get MRSA in healthcare facilities, the infections tend to be severe. Common infections include surgical wound infections, urinary tract infections and bloodstream infections, and pneumonia.

Visitors of Infected Patients

When visiting MRSA patients, individuals should follow the facility's visitor policies. Casual contact, such as kissing, hugging, and touching, is usually acceptable. Visitors should avoid touching catheters or wound sites and should wash their hands before leaving an infected person's room.

Skin Infections in the Community

MRSA in the community is widespread and therefore, anyone is at risk. Most people who get MRSA in the community get infections of the skin. Factors that have been associated with the spread of MRSA skin infections include: close skin-to-skin contact, openings in the skin such as cuts or abrasions, contaminated items and surfaces, crowded living conditions, and poor hygiene. People may be more at risk in locations where these factors are common, including: athletic facilities, dormitories, military barracks, correctional facilities, and daycare centers.

Diagnosis and Testing of MRSA Infections

MRSA should be included in the differential diagnosis of skin and soft tissue infections (SSTIs) compatible with *S. aureus* infections, especially those that are purulent (fluctuant or palpable fluid-filled cavity, yellow or white center, central point or "head," draining pus, or possible to aspirate pus with needle or syringe). A patient presenting a complaint of a "spider bite" should raise suspicion of a *S.aureus* infection. Recent data suggest that MRSA in the community is increasing. The spectrum of disease caused by MRSA appears to be similar to that of *Staphylococcus aureus* in the community. SSTIs, specifically furuncles (abscessed hair follicles or "boils"), carbuncles (coalesced masses of furuncles), and abscesses, are the most frequently reported clinical manifestations.

Diagnoses: In general, a culture should be obtained from the infection site and sent to the microbiology laboratory. If *S. aureus* is isolated, the organism should be tested to determine which antibiotics will be effective for treating the infection.



Skin Infection Culturing: A culture of a skin lesion is especially useful in recurrent or persistent cases of skin infection, in cases of antibiotic failure, and in cases that present with advanced or aggressive infections.

Distinguishing CA-MRSA from HA-MRSA

Based on Patient History, persons with MRSA infections that meet all of the following criteria likely have CA-MRSA infections:

- Diagnosis of MRSA was made in the outpatient setting or by a culture positive for MRSA within 48 hours after admission to the hospital.
- No medical history of MRSA infection or colonization.
- No medical history in the past year of: hospitalization, admission to a nursing home, skilled nursing facility, or hospice, dialysis, or surgery.
- No permanent indwelling catheters or medical devices that pass through the skin into the body.

Biological Differences of CA-MRSA and HA-MRSA

Recently recognized outbreaks of MRSA in community settings have been associated with strains that have some unique microbiologic and genetic properties compared with the traditional hospital-based MRSA strains, suggesting some biologic properties (e.g., virulence factors) may allow the community strains to spread more easily or cause more skin disease. Additional studies are underway to characterize and compare the biologic properties of HA-MRSA and CA-MRSA strains. There are at least three different *S. aureus* strains in the United States that can cause CA-MRSA infections.

Reporting MRSA to Public Health Authorities

MRSA is reportable in several states. The decision to make a particular disease reportable to public health authorities is made by each state, based on the needs of that individual state.














How to prevent the spread of MRSA?

Good general hygiene including proper cleaning and covering of wounds, hand hygiene, no sharing of personal items, and maintaining a clean environment will all help reduce the risk of MRSA transmission.

Cleaning and Disinfection:

MRSA is known to survive on environmental surfaces for several months so diligent and frequent cleaning and disinfection of environmental surfaces as part of a comprehensive “Environmental Hygiene Plan” should be a key prevention strategy at healthcare, correctional, and athletic facilities. In addition, schools, universities, and other institutions that house large numbers of people should institute similar prevention plans.

MRSA is a Gram-positive bacteria which is susceptible to the following Diversey disinfectants:

Product	Oxivir® 1 RTU / Wipes	Oxivir® Tb RTU / Wipes	Oxivir® Five 16	Alpha® HP Multisurface Disinfectant Cleaner	Avert™ Sporicidal Disinfectant Cleaner/Wipes	Virex® II 256	Virex® Tb	Virex® Plus	Expose® II 256	MoonBeam®3 UV Disinfection
Contact Time (Min)	1	1	5	5	1	5	3	3	10	3
										
Product	Oxivir® Tb RTU / Wipes	Oxivir® Plus (Concentrate)	Virox® 5 Concentrate	Virox® 5 (RTU & Wipes)	Percept (TMNC) (Concentrate, RTU & Wipes)	Virex® II 256	Avert™ Disinfectant Cleaner	MoonBeam®3 UV Disinfection		
Contact Time (Min)	1	5	5	5	5	5	1	3		
