

## MRSA

Methicillin -Resistant Staphylococcus Aureus (MRSA) - Contributed by David Vidra, CLPN, OSHA Authorized Outreach Instructor.

### What is MRSA?

MRSA stands for methicillin-resistant Staphylococcus aureus. Staphylococcus aureus are bacterium commonly found on the skin and/or in the noses of healthy people. Although usually harmless at these sites, Staphylococcus aureus (staph) may occasionally get into the body and cause infections through breaks in the skin, such as abrasions, cuts, wounds, tattooing, body piercing, or surgical incisions. These infections may be mild, such as pimples or boils, or serious, such as an infection of the blood stream, bones, or joints.

The treatment of infections due to Staphylococcus aureus was revolutionized in the 1940s by the introduction of the antibiotic penicillin. Unfortunately, most strains of Staphylococcus aureus are now resistant to penicillin. This is because Staphylococcus aureus has learned to make a substance called B-lactamase (pronounced beta-lactamase) that degrades penicillin, destroying its antibacterial activity.

Some related antibiotics, such as methicillin, are not affected by B-lactamase and can still be used to treat many infections due to B-lactamase-producing stains of Staphylococcus aureus. Unfortunately, however, certain strains of Staphylococcus aureus, have now also become resistant to treatment with methicillin, thus resulting in Methicillin resistant Staphylococcus aureus - MRSA.

MRSA skin infections can present in a number of forms:

- **Cellulitis** – Inflammation of the skin
- **Impetigo** – Blistered lesions or abraded skin with honey-colored crust
- **Folliculitis** – Infection of the hair follicle (like a pimple)
- **Furunculosis** – Deeper infection below the hair line Carbuncle – Multiple adjacent hair follicles and substructures are affected
- **Abscess** – Pus-filled mass below skin structures
- **Infected laceration** – Pre-existing cut that has become infected

Although other types of antibiotics can still be used to treat infections caused by MRSA, these alternative drugs are usually not available in pill form and must be administered instead through a vein.

## **Who gets MRSA infection?**

Skin infections with MRSA are transmitted by close skin-to-skin contact with an infected person or by contact with objects or surfaces contaminated with MRSA. Most often MRSA infections occur in hospital patients; however, reports of MRSA infections acquired outside of a hospital setting (community-acquired) are becoming more common.

As with ordinary strains of *Staphylococcus aureus*, some people harbor MRSA on their skin or in their nose without harm, whereas other people may develop infections.

People with an increased risk of developing infection include those with breaks in their skin due to abrasions, cuts, wounds, tattooing, body piercing, or surgical incisions; those with certain types of immune system deficiency, such as low number of white cells in their blood; athletes participating in contact sports; IV drug users; and those living in crowded, unsanitary conditions with poor hygiene (i.e., prisoners).

When MRSA spread from a site where they are harmless to a site where they cause infection - this results in an infection described as “endogenous.” In addition to causing endogenous infections, MRSA can spread between people, usually by direct or indirect physical contact. For example, a tattoo artist performing a procedure on an infected client may become contaminated with MRSA. They may then spread the bacteria to other clients with whom they subsequently have contact. These clients may then become infected. The spread of MRSA (as well as other bacteria) from client-to-client is called cross-infection.

MRSA can also survive on inanimate objects or surfaces such as tables, sinks, floors, and even mops.

## **Can the spread of MRSA be controlled?**

There are several steps that can be taken to minimize the spread of MRSA.

- Body modification practitioners should wash their hands scrupulously, preferably using an antibacterial soap and disposable towels;
- Disposable gloves should be worn for every instance of client contact;
- The skin of the area where the tattoo or body piercing procedure will be performed should be prepped using a broad-spectrum topical antiseptic microbicide.
- Carefully dispose of materials that come in contact with blood or other potentially infectious material (OPIM);
- Personal protective equipment should be worn (gloves, aprons, sleeves) whenever handling contaminated instruments post-procedure and during equipment decontamination and sterilization;
- All work surfaces and other potentially contaminated surfaces and objects should be thoroughly cleaned and disinfected as soon as possible using an EPA registered, hospital level disinfectant.

## **Symptoms of MRSA**

MRSA is a type of staph so the symptoms of a MRSA infection and the symptoms of an infection due to other staph are the same. Pimples, rashes, pus-filled boils, especially when warm, painful, red or swollen, can mean that you have a staph skin infection and a doctor should be seen.

Because MRSA can't be identified without special lab tests, it is not always identified and treated correctly when antibiotic treatment is needed. Doctors may assume that a MRSA infection is a common staph infection and treat with antibiotics that do not kill MRSA. This potential delay in recognizing and treating MRSA infections effectively can result in more serious infections such as severe skin infection, surgical wound infections, prolonged illness, and rare life threatening illnesses in the blood, heart and bones.

The symptoms could include fever, chills, muscle aches, malaise- symptoms of flu; also chest pain, shortness of breath leading to heart infections (endocarditis), toxic shock syndrome, and septicemia (blood poisoning). Essentially, people can become very ill and die from MRSA infection.

## **How is MRSA treated?**

### **Individuals colonized with MRSA**

Individuals simply colonized with MRSA may have a special antibiotic, such as Bactroban, applied onto their skin or inside of their nose. This helps eliminate MRSA and reduces the risk of the bacteria spreading to other sites on the body where they may cause infections, or to other people. However, some strains of MRSA are resistant to Bactroban. Individuals colonized with MRSA may also wash their skin and hair with suitable antiseptics, such as chlorhexidine.

### **Individuals infected with MRSA**

Individuals with infections due to *Staphylococcus aureus* often need antibiotics. Infections due to normal strains of *Staphylococcus aureus* are often treated with methicillin or an equivalent antibiotic, but these drugs are ineffective against MRSA.

Although MRSA are resistant to many drugs, most remain susceptible to glycopeptide antibiotics, such as vancomycin. Infections due to MRSA are therefore often treated with this drug. Vancomycin must be administered by infusion or injection, and for this reason, they are used for treatment only in hospitalized patients. In addition, injection of vancomycin into muscle is painful and thus not used, while rapid administration into a vein may produce an allergic-type reaction. To overcome these problems, vancomycin must be given by slow infusion into a vein.

A very rare MRSA resistant to vancomycin has been found (6 or 7 to date, all from the United States) and there is concern that they may become more common in the future.