



Louisiana Office of Public Health
Infectious Disease Epidemiology
Section
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Methicillin Resistant *Staphylococcus aureus* (MRSA) in Schools

These guidelines are to help in developing a program to address managing children with methicillin-resistant *Staphylococcus aureus* (MRSA) infections and MRSA outbreaks specifically in the school setting.

BASIC INFORMATION ABOUT MRSA

The emergence of antibiotic resistant bacteria has become a significant public health concern. Due to the extensive use of antibiotics, the sharing of antibiotics, and/or the failure to complete a course of antibiotics, our current arsenal of antibiotics is becoming ineffective against common bacterial infections. *Staphylococcus aureus* (commonly referred to as "staph") is a bacteria that can live on human skin of even the cleanest individuals. It can cause boils, wound infections, abscesses, cellulitis, impetigo, pneumonia and even bloodstream infections. The Centers for Disease Control and Prevention (CDC) estimate that 25-35% of children and adults in the United States have staph colonization— staph living on them, but not harming them. Staph like to live in the nose, groin, around the anus, armpits, finger tips, tracheostomy sites, wounds and in the secretions of intubated patients. Staph spreads by direct skin-to-skin contact with an infected individual or a colonized individual or more rarely from objects contaminated by these individuals such as sheets soiled with infected wound drainage. Staph is not found in dirt or mud or carried through the air.

The emergence of MRSA

In the past, staph infections were easily treated with a short course of penicillin with very few complications. Unfortunately, staph infections quickly became resistant to penicillin. Methicillin, along with other drugs, was developed in the 1950s to address the problem. However, by the 1960s, methicillin-resistant strains of staph began to appear. By the 1980s, *Staphylococcus aureus* infections resistant to methicillin and methicillin-related drugs were becoming highly prevalent and continue to increase to this day. These resistant infections were labeled methicillin-resistant *Staphylococcus aureus* (MRSA). Fortunately, there are still different classes of antibiotics that can be used to control these infections, but resistance continues to spread to our newer drugs and threatens to exhaust our supply of effective treatments if practices are not put into place to stop irresponsible antibiotic use. MRSA started in hospitals and other medical facilities, but it has progressively become more common in the community and other institutions such as schools, day care centers and prisons/ correctional institutions.

In Louisiana, it is estimated that

- 30% of the general population are carriers of Staphylococci
- 1% of the low risk population are carriers of MRSA.
- 5-20% of high risk population are carriers of MRSA (patients with multiple hospitalization, residents of long term facilities, chronically ill patients, inmates in detention facilities...)
- This means that out of a 4,500,000 population, 1,500,000 are carriers of *S. aureus* and 45,000 are carriers of MRSA.

Is MRSA a problem for school healthcare professionals?

There are several reasons why school health professionals are concerned about MRSA.

1. Throughout the USA, MRSA infections are becoming more common in community settings, including schools.
2. Staph, including MRSA, are spread by direct contact. In school settings, there are many opportunities for direct contact among students, especially those on athletic teams or in residential facilities.
3. A MRSA outbreak can cause much anxiety for parents, students and staff; MRSA infection can vary widely in severity.
4. Identifying a MRSA infection can be difficult because the symptoms of MRSA infection are similar to those of other skin infections.

High risk groups in the school

Several states, including Louisiana, have reported MRSA infections among wrestling, football teams, all contact sports teams and even in residential dormitories.

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.

However, MRSA infections sometimes occur among previously healthy persons with no identifiable risk factors.

MRSA spreads easily

Staph, including MRSA, are spread by direct skin-to-skin contact, such as shaking hands, wrestling, or other direct contact with the skin of another person. Staph are also spread by contact with items that have been touched by people with staph, for example towels shared after bathing and drying off, or shared athletic equipment in the gym or on the field.

Most people who have staph or MRSA on their skin do not have infection or illness caused by staph. These people are "colonized" with staph. Staph infections start when staph gets into a cut, scrape or other break in the skin. People who have skin infections should be very careful to avoid spreading their infection to others. Steps to prevent spread are listed below.

MRSA skin infections can occur anywhere.

- Some settings have factors that make it easier for MRSA to be transmitted.
- These factors, referred to as the 5 C's, are as follows: Crowding, frequent skin-to-skin Contact, Compromised skin (i.e., cuts or abrasions), Contaminated items and surfaces, and lack of Cleanliness.
- Locations where the 5 C's are common include schools, dormitories, military barracks, households, correctional facilities and day-care centers.

Symptoms of an infection caused by 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 often the same. Pimples, rashes, pus-filled boils, especially when warm, painful, red or swollen, can indicate a staph skin infection. Impetigo is one example of a skin infection that can be caused by staph, including MRSA.

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).

Staph, including MRSA, can also cause more serious infections such as severe skin infection, surgical wound infections, bloodstream infections and pneumonia. The symptoms could include high fever, swelling, heat and pain around a wound, headache, fatigue and other symptoms.

Confirming MRSA

MRSA can only be diagnosed by culture and laboratory testing. The laboratory will also perform antibiotic susceptibility testing. Unfortunately, misdiagnosis or delayed diagnosis of MRSA infection can result in delayed treatment and more serious complications.

Treatment of MRSA infections

Most MRSA infections are treated by good wound and skin care: keeping the area clean and dry, washing hands after caring for the area, carefully disposing of any bandages and allowing the body to heal. Almost all MRSA skin infections can be effectively treated by drainage of pus with or without antibiotics.

Sometimes treatment requires the use of antibiotics. If antibiotics are needed, it is important for the patient to use the medication as directed unless the healthcare provider says to stop. If the infection has not improved within a few days after seeing the healthcare provider, the student should contact the provider again.

Antibiotic Resistance

MRSA is part of a larger problem of antibiotic resistance. In the long term, *Staphylococcus aureus* may become resistant to many more antibiotics. For this reason it is important that healthcare providers diagnose MRSA early and accurately, prescribe appropriate antibiotics if needed and direct patients to complete the full course of antibiotics as prescribed. At the same time, healthcare providers should be cautious about the unnecessary use of antibiotics, which can contribute to the problem of antibiotic resistance.

SCHOOL MANAGEMENT

Management of a student reported to have MRSA

Consider taking the following steps:

Confirm the diagnosis. This may require contacting the doctor and family of the student to ensure that accurate medical information is available.

Follow routine infection control precautions. Use the following infection control precautions with a student who has MRSA infection if school staff has to touch the student:

- Wear gloves when handling the student, or touching blood, body fluids, secretions, excretions and any items contaminated with these fluids. Gloves should be used before touching mucous membranes and non-intact skin. Gloves should be removed after use and handwashing performed before touching non-contaminated items and environmental surfaces and before tending to another student.
- Linens (e.g., from cots) that may contain blood, secretions, or excretions should be handled in a manner to prevent skin, mucous membrane and clothing exposure.
- Follow routine procedures for cleaning the environment. In general, use routine procedures with a freshly prepared solution of commercially available cleaner such as detergent, disinfectant-detergent or chemical germicide. No special disinfection is recommended.
- School attendance. **Students and staff with a MRSA infection can attend school regularly as long as the wound is covered and they are receiving proper treatment.** Students and staff do not need to be isolated or sent home in the middle of the day if a suspected staph or MRSA infection is noticed. Wash the area with soap and water and cover it lightly. Those who touch the wound should wash their hands immediately. The student should be encouraged to have the wound looked at by their healthcare provider as soon as possible to confirm a MRSA infection and determine the best course of treatment. The wound should be kept lightly covered until it has dried completely.

Personal Hygiene for all Children and Employees:

- All employees and children should have ample access to soap, water and clean towels.
- Small alcohol-based hand sanitizers can be beneficial for employees to carry when soap and water is unavailable.
- Commercial disinfectants or bleach solutions (as described earlier) should be used to daily clean equipment or other parts of the facility especially those which have come in contact with the infected patient.
- Phenol-containing sprays such as Lysol® can be used to disinfect upholstered/cloth surfaces.
- Soiled laundry should be carried in a plastic or waterproof container; hands should be washed thoroughly after handling any laundry.

Wound Care Recommendations

Consult the physician or medical staff:

Facility personnel should always consult with the parent concerning any wounds or suspected infections which have been noticed at the daycare or during recent physician visits. The physician should examine the child and obtain a culture and sensitivities to determine the best treatment for the child. If antibiotics are deemed necessary by the physician, the parent should ensure that the child takes all of the antibiotics as prescribed even if the wound appears healed. The daycare should not require antibiotic treatment for admittance back into daycare. The physician should address all other concerns including participation in daycare activities and wound care which should be followed exactly. If the wound does not heal or show signs of improvement in the time frame provided by the physician, the daycare should notify the parent immediately who in turn should notify the physician.

It is important that there is an open communication between the parent and the daycare provider concerning the health of the child.

Wound care (if done at the school):

- Handle all wounds as potential MRSA infections until confirmed with culture and sensitivities.
- Do not allow other children or employees to contact the infected person's wound or objects with which the infected person may have contaminated unknowingly (bedding, toys, personal care items, etc.)
- Encourage the parent to take the child to the physician.
- Ask the parent to keep you informed of the child's condition and culture results.
- Follow all instructions given by the physician exactly.
- Keep the wound covered.
- Change the dressings as instructed by the physician. This is usually at least twice a day or when drainage becomes apparent whichever is sooner.
- Always wear clean gloves right before touching the site.
- Remove gloves and throw them away before touching any non-contaminated object or other person.
- Wash hands after removal of gloves and when moving from one site or patient to the next.
- Throw away contaminated items used for wound change in a separate bag from regular trash.
- Wash with soap and water reusable items such as scissors and tweezers. Then wipe them with 70% isopropyl alcohol (rubbing alcohol) and allow to air dry. These items can be used again, but only for that child.

Medications:

- Only give antibiotics prescribed by a physician for that child.
- Never share antibiotics or topical treatments.
- Finish all antibiotics prescribed even if the wound has completely healed.
- Never give antibiotics to children or employees to attempt to prevent an infection.

- Misuse or overuse of antibiotics can lead to harm to the child and spread of resistant bacteria.

Parent notification

- Typically, it is not necessary to inform the entire school community about a MRSA infection. When MRSA occurs within the school population, the school nurse and school physician should determine, based on their medical judgment, whether some or all parents and staff should be notified. If necessary, consult with the Louisiana Office of Public Health Infectious Disease Epidemiology Section (**800-256-2748**). Prior to parent notification, discuss the issue with the school administrator.

Students with immune suppression or HIV

Students with weakened immune systems may be at risk for more severe illness if they get infected with MRSA. These students should follow the same prevention measures as all others to prevent staph infections, including practicing good hygiene, covering wounds (e.g., cuts or abrasions) with clean dry bandages, avoiding sharing personal items such as towels and razors and contacting their doctor if they think they have an infection.

Reporting requirements for MRSA

Any cluster of illness is reportable to the Louisiana Office of Public Health Infectious Disease Epidemiology Section (Call the 24hr number **800-256-2748**) and you will speak with an epidemiologist. An individual case of MRSA is not reportable by healthcare providers.

Closing schools because of an MRSA infection

The decision to close a school for any communicable disease should be made by school officials in consultation with local and/or state public health officials. However, in most cases, it is not necessary to close schools because of an MRSA infection in a student. It is important to note that MRSA transmission can be prevented by simple measures such as hand hygiene and covering infections.

Closing school to be cleaned or disinfected when an MRSA infection occurs

- **Covering infections will greatly reduce the risks of surfaces becoming contaminated with MRSA.** In general it is not necessary to close schools to "disinfect" them when MRSA infections occur. MRSA skin infections are transmitted primarily by skin-to-skin contact and contact with surfaces that have come into contact with someone else's infection.
- When MRSA skin infections occur, cleaning and disinfection should be performed on surfaces that are likely to contact uncovered or poorly covered infections.
- Cleaning surfaces with detergent-based cleaners or Environmental Protection Agency (EPA)-registered disinfectants is effective at removing MRSA from the environment.
- It is important to read the instruction labels on all cleaners to make sure they are used safely and appropriately.
- Environmental cleaners and disinfectants should not be used to treat infections.
- The EPA provides a list of EPA-registered products effective against MRSA: <http://epa.gov/oppad001/chemregindex.htm>

Notification for MRSA infection

- Usually, it should not be necessary to inform the entire school community about a single MRSA infection. When an MRSA infection occurs within the school population, the school nurse and school physician should determine, based on their medical judgment, whether some or all students, parents and staff should be notified. Consultation with the local public health authorities should be used to guide this decision.
- Remember that staphylococcus (staph) bacteria, including MRSA, have been and remain a common cause of skin infections.
- Consult with your school about its policy for notification of skin infections.

Exclusion from attending school

- Unless directed by a physician, students with MRSA infections should not be excluded from attending school.
- Exclusion from school should be reserved for those with wound drainage ("pus") that cannot be covered and contained with a clean, dry bandage and for those who cannot maintain good personal hygiene.
- Students with active infections should be excluded from activities where skin-to-skin contact is likely to occur (e.g., sports) until their infections are healed.

General Prevention of MRSA

Early treatment is crucial in stopping these infections from causing serious harm. The location of the wound will determine which steps need to be taken to best prevent spread.

HAND WASHING or use of hand sanitizers IS THE MOST IMPORTANT STEP IN PREVENTING MOST INFECTIOUS DISEASES.

Personal Protection from getting MRSA

You can protect yourself by:

- practicing good hygiene (e.g., keeping your hands clean by washing with soap and water or using an alcohol-based hand sanitizer and showering immediately after participating in exercise)
- covering skin trauma such as abrasions or cuts with a clean dry bandage until healed
- avoiding sharing personal items (e.g., towels, razors) that come into contact with your bare skin; using a barrier (e.g., clothing or a towel) between your skin and shared equipment such as weight-training benches
- maintaining a clean environment by establishing cleaning procedures for frequently touched surfaces and surfaces that come into direct contact with people's skin.

Correct hand washing technique:

When using soap and water:

1. Wet hands with warm running water.
2. Apply liquid soap to palm of hand.
3. Vigorously rub hands together working soap into a lather and covering all surface of wrists, hands, fingers and under fingernails for at least 15 seconds.
4. Rinse hands with water and dry thoroughly with a clean disposable towel.
5. Turn off faucet with a towel.

When using alcohol-based hand rub:

1. Apply product to palm of one hand (see product instructions for amount).
2. Rub hands together, covering all surfaces of hands, fingers and nails thoroughly.
3. Continue to rub until hands are completely dry.

When to wash:

- After any contact with your or your child's nose, mouth, eyes, ears, groin, anus, blood, or bodily fluids (includes, sneezing, coughing, blowing your nose, rubbing eyes, eating, using the restroom, etc.).
- Before and after direct contact with another person or their belongings especially if infected or a known carrier.
- Wash hands before coming into and leaving the daycare facility.
- Anytime hands are visibly dirty or soiled.

Some other recommendations include:

- Draining wounds should be kept covered.
- Other persons or children should not come into contact with an employee's or child's infection or wound.

- Non-contact activities are permissible if the wound is covered at all times and the person/child practices good hygiene—frequent hand washing, showering and clean clothes.
- Contact activities should be suspended until the wound is completely healed
- Utensils, dishes, clothes and other laundry should be washed normally with hot water and normal detergents. Laundry should be dried on the hottest setting.
- Clean non-sterile gloves should be used by employees caring for the child's wound or infection.
- Change gloves when moving from one body site to another or from one child to another.
- Discourage the sharing of personal care items, towels, sheets, etc.
- Use liquid soap instead of shared bar soap that is mild and non-irritating.
- Discourage the use of extended artificial nails especially when caring for wounds.
- Keep nails neatly trimmed short and free of debris under the nail.
- Do not add soap to a partially empty soap container. This can lead to bacterial contamination.
- Use moisturizers or hand lotions to keep skin healthy.
- Transport soiled items in a plastic bag or other waterproof container.
- Inform laundry workers of contaminated articles and pre-rinse/wash grossly soiled items.
- Clean the facility and used recreational equipment daily with a commercial disinfectant or a daily prepared solution of 1:100 bleach and water mix (1 tablespoon bleach in 1 quart of water).

Preventing spread to others

- Cover your wound. Keep wounds that are draining or have pus covered with clean, dry bandages until healed. Follow your health-care provider's instructions on proper care of the wound. Pus from infected wounds can contain staph, including MRSA; keeping the infection covered will help prevent the spread to others. Bandages and tape can be discarded with the regular trash.
- Clean your hands frequently. You, your family, and others in close contact should wash their hands frequently with soap and water or use an alcohol-based hand sanitizer, especially after changing the bandage or touching the infected wound.
- Do not share personal items. Avoid sharing personal items, such as towels, washcloths, razors, clothing, or uniforms that may have had contact with the infected wound or bandage. Wash sheets, towels and clothes that become soiled with water and laundry detergent. Use a dryer to dry clothes completely.

Practical Advice for Teachers

- If you observe children with open draining wounds or infections, refer the child to the school nurse.
- Enforce hand hygiene with soap and water or alcohol-based hand sanitizers (if available) before eating and after using the bathroom.

Advice for School Health Personnel

- Students with skin infections may need to be referred to a licensed health care provider for diagnosis and treatment. School health personnel should notify parents/guardians when possible skin infections are detected.
- Use standard precautions (e.g., hand hygiene before and after contact, wearing gloves) when caring for nonintact skin or potential infections.
- Use barriers such as gowns, masks and eye protection if splashing of body fluids is anticipated.

Need More Information:

Always address any concerns or questions about correct treatment to your healthcare provider.

More information can also be obtained from your parish health unit, or the Infectious Disease Epidemiology Section of the Louisiana Office of Public Health and the Centers for Disease Control and Prevention (CDC) websites listed below.

Louisiana Office of Public Health Infectious Disease Epidemiology
[http:// www.infectiousdisease.dhh.louisiana.gov](http://www.infectiousdisease.dhh.louisiana.gov)

CDC Get Smart Program
<http://www.cdc.gov/drugresistance/community/index.htm>