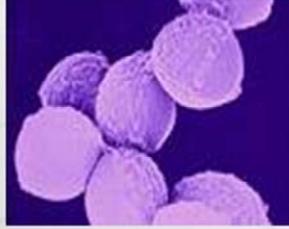


MRSA



Some things you shouldn't
share!



The Ohio Coalition for Antibiotic Resistance Education (Ohio CAREs), the Ohio Department of Health (ODH) School Nursing Program (SNP) and the ODH Bureau of Infectious Disease Control (BIDC) have developed this PowerPoint presentation to assist you in the education of students, staff and parents on methicillin-resistant *Staphylococcus aureus* (MRSA).

Special thanks to the University of Toledo and the Ohio Association of Physicians Assistants for their contributions to this publication.

What is MRSA?

- ✦ **M**ethicillin-
- ✦ **R**esistant
- ✦ **S**taphylococcus
- ✦ **A**ureus



MRSA is commonly pronounced “mer-sa.”



Staphylococcus aureus

- ✦ Commonly called “staph”
- ✦ Bacterium-not a virus
- ✦ Commonly found on humans
- ✦ Typically causes minor infections:
 - Boils
 - Abscesses
 - May appear to be a spider bite



- Staph typically is found in the nose and on the skin, and in other areas such as under the arms, groin and rectal areas.
- Staph can cause more serious infections such as pneumonia, joint and bloodstream infections. More severe infections are usually seen in hospitals or in people with weakened immune systems.
- While the infected area may have the appearance of a spider bite, it is unlikely to be a true insect or spider bite.

Spiders do not transmit MRSA. However, if a person scratches an insect bite and creates a break in the skin, bacteria may enter the wound and cause an infection.

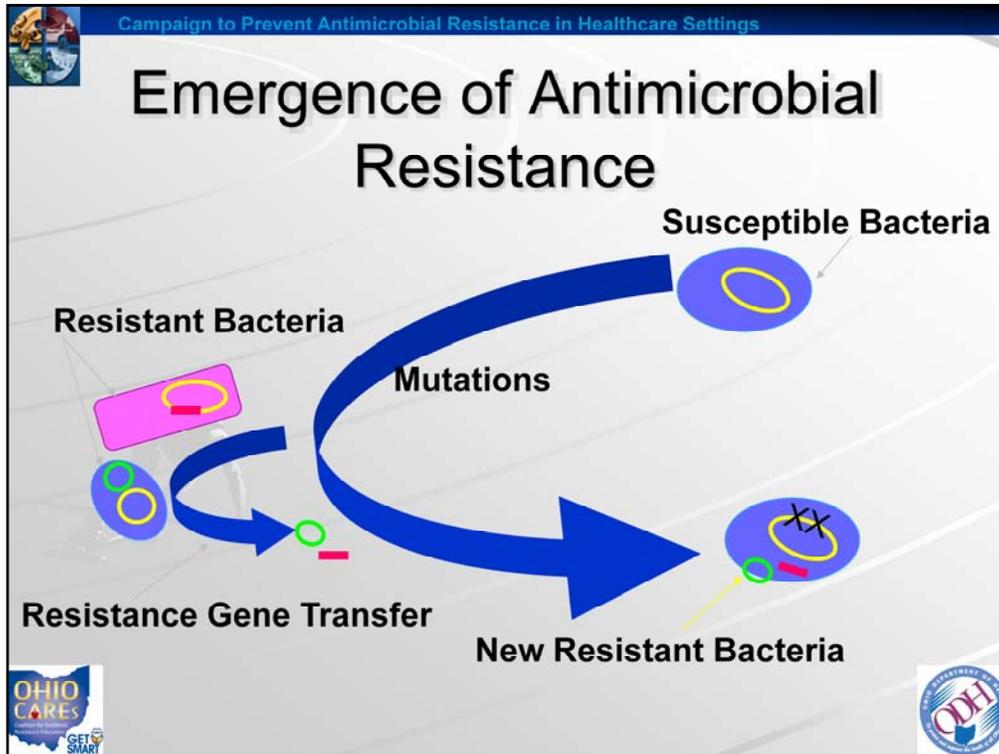


Methicillin-resistant

- ✦ Staph has become resistant to some antibiotics over time
- ✦ One of these antibiotics is methicillin, a penicillin derivative
- ✦ Improper use and overuse of antibiotics has led to more drug-resistant organisms



- When antibiotics are prescribed for an infection, one should take all of the antibiotics as directed.
- Some people improperly stop taking antibiotics when they start to feel better, and save the remaining antibiotics for later. When this occurs, some of the bacteria survive, and those that are left may have changed in such a way as to become resistant to that same antibiotic when it is used again.
- Thus, the bacteria that were originally susceptible to the antibiotic no longer are susceptible.



- Bacteria have developed numerous mechanisms to evade antimicrobial drugs.
- Bacteria change and the original antibiotic is no longer effective due to genetic material change. Survival of the fittest—adapt to survive.
- Sometimes the bacteria can develop resistance to more than one antimicrobial.



You cannot tell the difference between an infection with susceptible *S. aureus* and an infection due to a resistant *S. aureus*. A culture must be done to know the difference and what antibiotic to use.

What Symptoms Does a Person Have with a Staph Infection?

MRSA on the skin may be:

- ◆ Red
- ◆ Warm
- ◆ Swollen
- ◆ Tender
- ◆ Look like a spider bite or an infected hair follicle



- Common signs of a skin infection include redness, warmth, swelling and tenderness.
- The infected area may or may not have drainage.
- MRSA may present as cellulitis—a reddened, hard, tender, weeping lesion.
- MRSA typically worsens rapidly without appropriate treatment.
- Some people may report itching at the site.



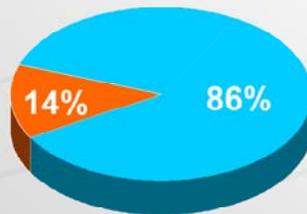
Is MRSA New?

- ✦ MRSA was first seen in hospitals in 1961
- ✦ MRSA was first seen in the community in 1980
 - Became more widespread in the 1990s
 - Became more frequently recognized after 2004



- The first HA-MRSA (healthcare-associated MRSA) was identified in the United Kingdom in 1961, shortly after methicillin was introduced into clinical practice.
- MRSA has long been a common pathogen in health care facilities, but in the past decade it has emerged as a problematic pathogen in the community setting as well.
- The first case of MRSA in the United States was described in 1968.
- The first CA-MRSA (community-associated MRSA) infection in the United States was reported in 1980.
- More widespread identification of CA-MRSA in the United State began in the 1990s following the report of CA-MRSA infections among four children.

Most Invasive MRSA Infections Are Health Care-associated



■ Community-associated
■ Health care-associated

Klevens et al JAMA 2007;298:1763-71



- Less than 15 percent of severe MRSA infections are seen in the community setting. The remainder are seen in the hospital environment.
- “Invasive MRSA” is found in the bloodstream, surgical wounds and bone, and may cause pneumonia. Invasive usually means that bacteria have caused infection in sterile parts of the body that should not have any bacteria present.



Colonization-Carrier

- ▶ Staph can be part of normal human bacteria
- ▶ Normal human bacteria may not cause infection
 - This is called “colonization”
 - ▶ Someone who is colonized may be called a “carrier”
 - Humans are most often colonized in the nose and on the skin



- The Centers for Disease Control and Prevention (CDC) estimates up to 20 percent of the population is colonized with staph, many with MRSA.



Role of Pets

- ◆ Most people are infected with MRSA by other people
- ◆ Household pets **may** carry MRSA
 - The pet likely acquired it from a human
- ◆ Very few people are actually infected with MRSA by their pets



- It is reasonable to consider a pet as a source if transmission continues in a household when appropriate treatment and household cleaning has occurred.
- Colonization of pets tends to be short term and self limiting. Gorwitz (2007).
- Owning a pet does not increase your risk of contracting MRSA.
- Any animal can carry MRSA, although it is more commonly found on animals living in close proximity to humans
 - with a MRSA infection. Hand washing after encountering animals is a good prevention activity.



Transmission

- ✦ There must be a break in the skin for infection to occur, such as:
 - Rug, turf, mat or razor burns
 - Cuts, scrapes and burns
 - Chapped skin
- ✦ Skin-to-skin contact
- ✦ Contact with a contaminated surface



- Most MRSA infections are transmitted by skin-to-skin contact, with a few transmitted by contaminated surfaces.
- MRSA is not transmitted by coughing or sneezing (droplet).
- Thermal burns (cold or hot) may also be portals of entry for MRSA.
- This is a picture of a turf burn, not MRSA. To prevent infection, abrasions such as this turf burn should be cleaned and covered with a clean dressing.
- Usually the colony count on a contaminated surface decreases after 24 hours, but under certain conditions, MRSA bacteria can survive on surfaces for up to one week.



How is MRSA Treated?

- ◆ An infection must be cultured by a health care provider to determine if it is MRSA
- ◆ An infection may be treated solely by “incision and drainage”
- ◆ Some infections may require treatment with an appropriate antibiotic



- An appropriate antibiotic is identified when the wound is cultured.



Infection Care-Don't Share!

- ✦ Keep the infected area clean and dry
- ✦ Keep a bandage on the infection if it is draining
- ✦ Change the bandage as directed by the health care provider or when it becomes:
 - Wet or dirty
 - Soaked with pus
 - Loose

Always wash your hands after touching the bandage or if you touch an infection!



- Always wash hands before and after changing a dressing.
- Immediately throw away the soiled dressing.
- Disinfect surfaces that come in contact with the wound or soiled dressing.



Antibiotics

- ▶ Antibiotics are **not** always necessary to treat MRSA
- ▶ When antibiotics are prescribed for **any** infection:
 - Take as directed
 - Do not skip doses
 - Take until gone
 - Do not share or save
- ▶ Do not take antibiotics prescribed at any other time, for any other illness or for another person



- Improper use of antibiotics contributes to the development of drug-resistant organisms (such as MRSA).



Prevention

The CDC has identified "5 Cs" to avoid:

1. **C**rowding
2. Skin-to-skin **C**ontact
3. **C**ompromised skin
4. **C**ontaminated items and surfaces
5. Lack of **C**leanliness



- The CDC has identified these areas to concentrate on to avoid MRSA.
- Schools, day care centers, households and athletic facilities may be areas where the 5 Cs are common.



Hand Washing

- ✦ The most effective method to prevent transmission of MRSA, the common cold, influenza, and other organisms
- ✦ There should always be water, soap and paper towels available
 - Allow time for frequent and thorough hand washing throughout the day
- ✦ Alcohol-based hand sanitizers may be used if soap and water are not available

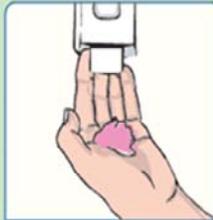


- Alcohol-based hand sanitizers are effective against staph and MRSA.
- Alcohol-based hand sanitizers must be at least 60 percent alcohol to be effective.

FIGHT GERMS BY WASHING YOUR HANDS!



1 Wet your hands



2 Soap



3 Lather and scrub - 20 sec



4 Rinse - 10 sec



5 Turn off tap



6 Dry your hands

DONT FORGET TO WASH:

- between your fingers
- under your nails
- the tops of your hands





What About Schools?

- ◆ How should the school be cleaned to prevent MRSA?
- ◆ Should the school be closed if someone has MRSA?
- ◆ Should a letter be sent home each time someone is diagnosed with MRSA?
- ◆ Should students or staff with MRSA be excluded?



- These are common questions regarding MRSA in the school setting.
- Persons with infections due to any organism that is not easily communicable are not required to report the infection to the school.



School Cleaning

- ✦ Frequently contacted surfaces (doorknobs, light switches, etc.) should receive special attention
- ✦ Check cleaning products for effectiveness against MRSA and other disease-causing organisms
- ✦ Appropriate cleaners include a 10 percent bleach solution or Environmental Protection Agency (EPA)-registered disinfectants effective against MRSA


<http://www.epa.gov/oppad001/chemregindex.htm>


- The CDC does **not** recommend that schools be closed for special cleaning and disinfecting for MRSA.
- Remember to include buses and other places students may come in contact with contaminated surfaces.
- Detergent-based cleaners may also be effective against MRSA –check the EPA list.
- If a product label states the product is effective against staph, it will also be effective against MRSA.
- A 10 percent solution corresponds to one and one half (1.5) cups of household bleach per gallon of water, or one part bleach to nine parts water.
- To use a bleach solution effectively, you must:
 - Make a fresh bleach solution each day. Discard any solution left at the end of the day; bleach breaks down after 24 hours of being mixed in a solution (Clorox ® states that bleach remains stable when mixed with hot water).
 - Bleach solution should be applied directly to the surface with an applicator such as a towel so the surface or object is saturated; do not use a spray bottle to apply a bleach solution.
 - The bleach solution must be left on the contaminated surface for 10 minutes before rinsing and drying.

CLOSED

School Closure

According to the CDC:

- ✦ It is not necessary to close schools to disinfect for MRSA
- ✦ If you suspect a MRSA outbreak in your school, **contact your local health department**

OHIO CARES
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OHIO DEPARTMENT OF HEALTH

- Presenter should share the local health department phone number with the audience as appropriate.
- An outbreak of MRSA is more than one person diagnosed with MRSA **with an epidemiological link**.
- An epidemiological link is one where there is a contact between infected persons through:
 1. Skin-to-skin contact
 2. Direct contact with wound drainage
 3. Shared contact with contaminated objects such as athletic equipment, towels or razors
- Examples include teammates on an athletic team, siblings in a family or children cared for at the same day care facility.
- There can be more than one case of MRSA in a school district at the same time that do not have an epidemiological link. This would **not** be considered an outbreak.

MRSA!

Notification

- ✦ The CDC does not recommend that schools notify families about a single case of MRSA in the school or community
- ✦ The school nurse should be consulted regarding students and staff who may be immunocompromised and at a higher risk of infection

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- Immunocompromised staff and students might need to be notified of the presence of MRSA or other communicable diseases as they are at higher risk of infection.
- The school nurse should be able to identify people in the schools who may need to be notified of the presence of communicable diseases in the school.



Exclusion

The CDC recommends that:

- ✦ Students and staff diagnosed with MRSA should be excluded only if the infection cannot be covered and drainage contained



- Proper treatment for MRSA does **not** always require antibiotic therapy; therefore, there is no period of time that every person diagnosed with MRSA should be excluded from school.
- The CDC says exclusion from school and sports activities 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.





Coaches

- ▶ The “5 Cs” may put athletes at a higher risk of contracting MRSA
- ▶ Coaches and athletic trainers must:
 - Enforce proper hygiene practices
 - Require students to report any suspicious skin injuries or infections, notify their parents and refer to their health care provider
 - Administer proper first aid
 - Maintain clean facilities



- There have been MRSA outbreaks on high school and college sports teams in Ohio.



Cleaning and Sanitation

- ◆ Athletic uniforms should be washed in hot water and dried completely between uses
- ◆ Shared gear (such as helmets) should be cleaned after each use
- ◆ Large shared equipment (such as weight machines) should be cleaned before and after use by each person



- Appropriate cleaning solutions are a 10 percent bleach solution and EPA-registered cleaning agents.
- Whirlpools and ice baths should be cleaned between each student use.
- Students with infections should not use whirlpools.

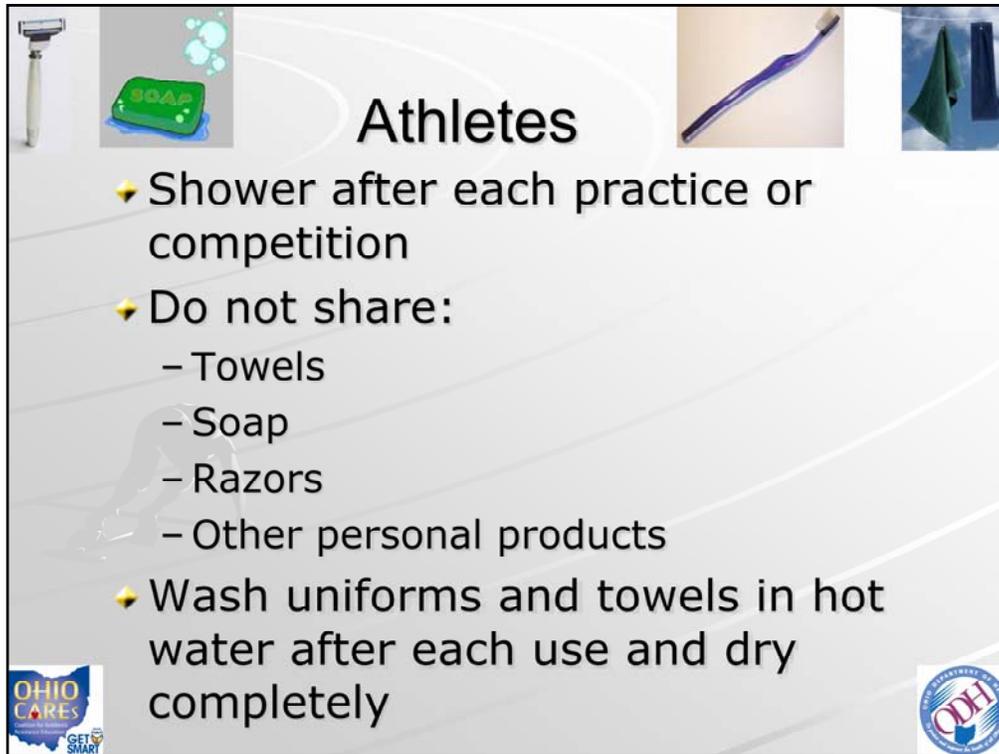


Stay in the Game

- ◆ Students with suspicious skin infections should notify their parents and health care provider and follow the treatment plan
- ◆ As long as a wound can be completely covered by a bandage that stays in place and contains drainage, the athlete may compete



- All players should use good hygiene at all times to prevent the spread of communicable diseases.
- The CDC says athletes must cover all wounds. If a wound cannot be covered adequately, consider excluding
players with potentially infectious skin lesions from practice or competition until the lesions are healed or can be
covered adequately.
- An adequately (or completely) covered wound is one where the bandage covers the entire infected area and
remains dry and intact throughout a practice or competition.



Athletes

- ▶ Shower after each practice or competition
- ▶ Do not share:
 - Towels
 - Soap
 - Razors
 - Other personal products
- ▶ Wash uniforms and towels in hot water after each use and dry completely



- After each use, athletic clothing should be placed in a plastic bag before being placed in a gym bag. This prevents the possible contamination of the bag and its contents.



Athletes

- ✦ Do not share a whirlpool or ice bath if you have a break in the skin such as a cut or turf burn
- ✦ Report any suspicious skin injuries to the coach, parent or health care provider
- ✦ If you are diagnosed with a staph infection, follow all the directions of your health care provider



Questions?

THANK YOU!

