

Angelo State University
Guidelines for the Management of Methicillin -Resistant *Staphylococcus Aureus*
(MRSA) Infections

PURPOSE

Angelo State University's *Guidelines for the Management of MRSA infections* provides recommendations for the prevention, treatment, and containment of methicillin-resistant *Staphylococcus aureus* infections within Angelo State University's Community.

PROCEDURES

INTRODUCTION

MRSA is an important cause of hospital-acquired infections (HAIs) in many U.S. hospitals; therefore, certain hospitalized students are at risk for MRSA colonization and MRSA infections. Community-associated (CA-MRSA) MRSA infections may also occur in persons who have no history of recent hospitalization, or other known risk factors such as prior antibiotic usage, injection drug use, or long-term inpatient care. CA-MRSA is becoming increasingly prevalent in community settings and specifically on athletic teams. CA-MRSA is emerging as a distinct infectious process and hospital accessed MRSA models may not necessarily apply to CA-MRSA. Incidents of CA-MRSA can in some cases result in outbreaks that can be costly and difficult to control with potentially serious public health consequences.

MRSA infections often present as mild skin or soft tissue infections, such as a furuncle, that occurs spontaneously and may evolve to include multiple lesions. Students with MRSA skin infections commonly complain of "an infected pimple," "an insect bite," "a spider bite," or "a sore." However, since many MRSA infections cause minor inflammation without pain, infected students may not seek medical attention. More serious MRSA infections such as cellulitis, deep-seated abscesses, septic arthritis, pneumonia, and sepsis may occur, even in otherwise healthy individuals. Persons with complicating medical conditions such as diabetes, HIV infection, chronic skin conditions, are at increased risk of serious MRSA infections.

Treatment strategies that focus on education, early detection, appropriate management, improved hygiene practices and maintenance of a clean environment have proven successful in control and prevention of CA-MRSA.

COLONIZATION

An estimated 10% to 30% of persons are colonized with *Staphylococcus aureus* in their nares, mucous membranes, or breaks in their skin. Subsets of these persons are colonized with MRSA. Colonized persons are more likely to develop staphylococcal infections, however, many colonized persons remain asymptomatic. Staphylococcal colonization occurs more commonly in injection drug users, persons with type 1 diabetes,

hemodialysis patients, persons with acquired immunodeficiency syndrome (AIDS), surgical patients, and previously hospitalized patients. There also have been reported anecdotal evidence and outbreak studies that suggest that the noses of people who are going to be infected with CA-MRSA are clean.

TRANSMISSION

MRSA is transmitted from person to person most frequently by contaminated hands. MRSA may also be transmitted by sharing towels, personal hygiene items, athletic equipment, close-contact sports, sharing injection drug use equipment, and food borne outbreaks. Risk factors for transmission of CA-MRSA include crowding, frequent skin-to-skin contact, compromised skin, contaminated surfaces and shared items, and lack of cleanliness. Persons with MRSA pneumonia or asymptomatic MRSA nasal carriage may in rare instances transmit MRSA to other persons when coughing up large droplets of infectious particles.

MRSA outbreaks in the college setting have been linked to poor hygiene, sharing contaminated personal items or athletic equipment, skin-to-skin contact and compromised skin.

REPORTING

All confirmed MRSA infections must be documented in the student's medical record and after appropriate releases signed. The athletic trainer will be notified if student is involved in sports activities and the director of residence life will be notified if the student is living in university housing. All suspected or confirmed MRSA outbreaks will be reported to the appropriate Public Health Department

INFECTION CONTROL - PRIMARY PREVENTION

Containing MRSA infections in a university campus setting can be difficult, time consuming, and resource-intensive. Primary infection control measures are therefore helpful in reducing the incidence of MRSA infections. The following primary preventive measures should be implemented to reduce the incidence of MRSA infections among the college population:

Education: Students, Trainers, coaches, and staff should be provided information on the transmission, prevention, treatment, and containment of MRSA infections. Condensed information for students and athletes is outlined in **Appendix 3, Methicillin-Resistant *Staphylococcus aureus* (MRSA) Fact Sheet.**

Hand hygiene program: Hand washing is the simplest and most effective infection control measure for preventing and containing MRSA infections. The following hand

washing measures should be implemented:

- * Students and staff should periodically be provided education on the importance of hand hygiene and effective hand hygiene techniques.
- * Single use, disposable gloves should be readily available for staff that could potentially contact infectious blood or body fluids. The gloves may be sterile or nonsterile, depending on the task to be performed

Sanitation: MRSA is susceptible to most routinely used environmental cleaning agents. Sanitation measures are essential for preventing the spread of MRSA infections and include the following:

- * **Housing areas:** Student housing areas and bathroom facilities should be regularly cleaned with an EPA-registered detergent disinfectant according to the manufacturer's instructions. Equipment and furniture with torn surfaces that cannot be adequately cleaned should be repaired, covered, or discarded.
- * **Recreation facilities:** Recreational equipment, such as weight benches, should routinely be wiped clean after use with a disinfectant. Facility users should also be instructed to use barriers to bare skin, such as a towel or clean shirt, while using exercise equipment and all open lesions should be covered.
- * **Athletic Training Room:** Countertops and other treatable surfaces should be cleaned routinely per local schedule and after any contamination with blood or body fluids with an appropriate EPA-registered disinfectant.
- * **Laundry:** All shared athletic towels and laundry should be washed regularly with detergent in the hot water cycle and dried thoroughly. Air drying of laundry should be avoided. Towels should be distributed only when thoroughly dry.

Screening and Surveillance:

- * All students undergoing intake medical screening and physical examinations should be carefully evaluated for skin infections.
- * Recently hospitalized students and those at greater risk of serious MRSA infections such as students with diabetes, immunocompromised conditions, open wounds, recent surgery, or chronic skin conditions should be evaluated for skin infections during routine medical evaluations. Students participating in sports or recently discharged from the hospital should be specifically instructed to self-report any new onset skin infections or fever so that they can be evaluated for MRSA or other acquired infections.

- * Athletic trainers and coaches should be advised to refer students to the clinic who have draining sores or wounds or who self-report “boils,” “insect or spider bites,” or “sores.”

INFECTION CONTROL - SECONDARY PREVENTION

Containment: Students diagnosed with MRSA infections should be examined by a clinician to determine their risk of contagion to others. Students with potentially contagious infections such as wounds with uncontained drainage, weeping cellulitis, or draining skin sinuses, infected surgical wounds, multiple furuncles, infected burn sites, and MRSA pneumonia should be educated on proper handling of contaminated materials and hand washing. A short term private room may need to be considered for severe cases.

Contagious students with MRSA infections should have a separate toilet and shower whenever possible. If not feasible, the shower must be appropriately decontaminated prior to use by uninfected students. Toilet seats must also be decontaminated when soiling by an infected student is likely to occur, i.e., peri-rectal or thigh lesions, etc.

OUTBREAK MANAGEMENT

Detection of two or more cases of epidemiologically-related MRSA infections should prompt an immediate investigation to determine if an outbreak has occurred. Outbreak surveillance measures are not indicated if the MRSA infections are obviously unrelated. Once a MRSA outbreak is suspected the following measures should be taken:

Outbreak confirmation: MRSA isolates should be further evaluated for antibiotic susceptibilities.

An MRSA outbreak is suggested if similar antibiotic susceptibility patterns are identified among two or more MRSA isolates from epidemiologically-linked patients. Further confirmation of a MRSA outbreak through molecular analysis of MRSA isolates (e.g., pulsed-field electrophoresis) might be considered if the outbreak is extensive or when otherwise warranted for specific epidemiologic reasons.

Tracking: Students with suspected or confirmed MRSA infections should be systematically tracked using the form in **Appendix 1, MRSA Infection Line-Listing - (Tracking and Reporting Form)** in order to assess clustering of cases and help identify common source transmission.

Containment: Students with contagious MRSA infections should be examined by a clinician to determine the risk of contagion. Students with potentially contagious infections such as wounds with uncontained drainage, weeping cellulitis, non-healing abscesses, draining skin sinuses, infected surgical wounds, multiple furuncles, infected burn sites, and MRSA pneumonia should consider being assigned to a private room until the infection is contained. Athletic participation will be determined by the Clinic Physician, the students Primary Physician, and Athletic Trainers.

NOTE: Students with draining skin lesions that can be easily contained by simple dressings can be housed with other students, if the infected student adheres to infection control instructions and the infected student's room mate(s) is not at increased risk of acquiring an MRSA infection.

Surveillance: If an MRSA outbreak is suspected or confirmed, health care personnel should determine if students with MRSA infections have a common source of infection such as shared housing or athletic team participation, recreational practices, the same social affiliations, sexual contact with other students, hospitalization in the past 6 months.

Surveillance physical examinations for previously undetected MRSA infections should be considered in accordance with the following:

- * If a common source of the MRSA outbreak is suspected, all potential student contacts should be examined for unidentified skin or soft tissue infections or other evidence of MRSA infections.
- * If the outbreak involves multiple students, athletes or is sustained over time, targeted examinations should be considered for students who may be at higher risk of MRSA infections

Education: Educational efforts should target students, Athletic trainers, Clinic staff and other relevant staff in order to contain a MRSA outbreak.

Attachments :

- Appendix 1: MRSA Infection Tracking and Reporting form
- Appendix 2: Evaluation and Treatment of Skin and Soft Tissue Infections in the University Setting
- Appendix 3: MRSA Fact Sheet
- Appendix 4: Definitions

Evaluation and Treatment of Skin and Soft Tissue Infections in the Health Clinic

Initial Assessment and Treatment

- Conduct targeted history and physical examination.
- Determine if staphylococcal skin or soft tissue infection is probable.
- Assess risk factors for MRSA infection, including, athletic involvement, contact with other MRSA persons, and recent hospitalization.
- Assess risk factors for systemic infection.
- Obtain blood cultures, CBC if possibility of systemic infection or presence of fever.
- Drain/aspirate infection whenever possible and obtain cultures.
- Remove foreign bodies if present.
- Consider conservative treatment.
- Incision and drainage/hot soaks for limited infections.

Empiric Therapy

- If systemic infection/sepsis is possible immediate physician referral.
- If infection self-limited & cultures unobtainable or non-diagnostic & I & D unsuccessful, then consider empiric antibiotic therapy
- Consider empiric treatment with first generation cephalosporin, or amoxicillin/clavulanate, or erythromycin without MRSA risk factors
- In context of MRSA outbreak or presence of MRSA risk factors then treat with antibiotic from Appendix 2

Targeted Antibiotic Therapy

- If cultures and antibiotic sensitivities are available, target therapy accordingly
- Highly resistant MRSA isolates and serious infections usually require IV vancomycin therapy
- If susceptible 6 consider treatment with trimethoprim-sulfamethoxazole ± rifampin
- Also can consider other antibiotics based on susceptibility results
- Monitor patients closely since *in vitro* sensitivities may not correlate with clinical response Persistent or recurrent disease may indicate non-adherence, new infection, or resistance

Decolonization

- In context of MRSA outbreak consider decolonize nares with 2% mupirocin BID for 5 days; but of unproven benefit in the university setting.
- Decolonization with antiseptic a body wash such as chlorhexidine may be considered

Treatment Follow-up

- Re-evaluate 1 week after completion of antibiotic treatment examine for recurrent lesions and as indicated by infection
- Student education is a critical component of MRSA management.
- Students must be instructed on monitoring symptoms and must return for care if they develop systemic symptoms, worsening local symptoms or show no improvement in any way

Methicillin-Resistant *Staphylococcus aureus* (MRSA) Fact Sheet

What is MRSA?

Staphylococcus aureus, often referred to as “staph,” is a common type of bacteria that is found on the skin and in the nose of healthy persons. Staph bacteria may cause minor skin infections such as boils or more serious infections such as pneumonia and blood poisoning. Certain staph bacteria that have become resistant to first-line antibiotics are called MRSA. MRSA infections are more difficult to treat, but usually respond to antibiotic therapy. MRSA is NOT the “flesh-eating” bacteria.

How is MRSA spread from person to person?

MRSA is usually spread through direct physical contact with an infected person, but may also be transmitted through contact with contaminated objects or surfaces. MRSA is not spread by coughing unless the infected person has pneumonia.

How can I prevent becoming infected with MRSA?

Wash your hands thoroughly with soap and water or use an alcohol-based hand sanitizer (when hands are not visibly dirty) throughout the day, particularly every time you use the toilet, blow your nose, and before every meal.

- Never touch another person’s wounds, infected skin, or dirty bandages.
- Maintain excellent personal hygiene through regular showers and by keeping your living space clean, including the regular laundering of your bed linens.
- Don’t ever share personal hygiene items with others, including toiletries and towels.
- Clean off recreational equipment such as weight benches before direct contact with your body or use a clean barrier such as a towel or shirt between your bare skin and exercise equipment.
- Shower after participating in close-contact recreational activities whenever possible.

How does a person know that he or she has a MRSA infection?

Swabbing or aspirating pus from a skin infection is the most common way to detect MRSA.

Can MRSA be treated?

Strong antibiotics are usually effective in treating MRSA. Serious or highly resistant MRSA infections may require intravenous (IV) antibiotics in the hospital. Always seek medical if you develop a boil, red or inflamed skin, or a sore that does not go away that may look like an insect or spider bite.

DEFINITIONS

Staphylococcus aureus, often referred to as “staph,” is a commonly occurring bacterium that is carried on the skin and in the nose of healthy persons. *Staphylococcus aureus* may cause minor skin or soft tissue infections such as boils, as well as more serious infections such as wound infections, abscesses, pneumonia, and sepsis.

Methicillin-resistant *Staphylococcus aureus* or “MRSA” are staph bacteria that have become resistant to beta-lactam antibiotics, including: penicillin, ampicillin, amoxicillin, augmentin, methicillin, oxacillin, dicloxacillin, cephalosporins, carbapenems (e.g., imipenem), and the monobactams (e.g., aztreonam). MRSA causes the same types of infections as staph bacteria that are sensitive to beta-lactam antibiotics.

Colonization is the presence of bacteria on or in the body without causing infection.

Community-associated MRSA infections (CA-MRSA) develop outside a hospital or nursing home setting and may or may not be associated with a health care setting, e.g., recent hospitalization.

Primary prevention is the implementation of screening, infection control, treatment, and administrative measures aimed at reducing the incidence of MRSA infections in the student population.

Secondary prevention is the implementation of augmented screening, infection control, treatment, and administrative measures aimed at preventing further MRSA infections after the initial detection of a MRSA infection within the student population.

A MRSA outbreak is a clustering of two or more epidemiologically-related, culture-positive cases of MRSA infection. (NOTE: MRSA colonization data, when available, should also be considered when assessing outbreaks, since **new** cases of MRSA colonization without infection also indicate ongoing MRSA transmission.) Confirmation that a MRSA outbreak is caused by the same organism is suggested by similar isolate antibiotic susceptibilities and further supported if molecular analysis, such as pulsed-field gel electrophoresis, identifies a predominant MRSA strain.

Standard Precautions combine the major features of **Universal Precautions** for blood and body fluid (designed to reduce the risk of transmission of blood borne pathogens), and **Transmission-Based Precautions**. Transmission-based precautions are designed for patients documented or suspected to be infected with highly transmittable or epidemiologically important pathogens for which additional precautions beyond standard precautions are needed to interrupt disease transmission. There are three types of Transmission-based Precautions: 1) Airborne, 2) Droplet and 3) Contact.

Standard Precautions apply to: blood, all body fluids, secretions, and excretions (except sweat/tears), regardless of whether or not they contain visible blood. These precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection by utilizing Protective Barriers (e.g., gloves, gowns, mask, goggles, ventilation devices, etc).

Standard/Transmission-Based Precautions for SLU will include: (1) adequate hand hygiene measures in accordance with CDC guidelines after touching blood, body fluids, secretions, excretions (includes wound drainage), and contaminated items, whether or not gloves are worn; (2) the routine use of personal protective equipment (PPE) such as gloves, masks, eye protection or face shields, and gowns whenever contact with blood, body fluids, secretions, excretions (includes wound drainage) is anticipated; (3) ensuring that environmental surfaces in the Clinic and Athletic Training Rooms are routinely cleaned and disinfected; (4) ensuring that linens are handled and cleaned in a manner that prevents staff exposures to contaminated laundry and avoids the transfer of microorganisms from person to person or from place to place; and (5) the placement of students who may contaminate the environment or cannot be expected to maintain adequate hygiene or a sanitary environment in a private room.