



County of Erie

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HEALTH ADVISORY #210 **October 19, 2007** **PREVENTION AND CONTROL OF COMMUNITY-ASSOCIATED METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (CA-MRSA)**

Please distribute to Emergency Departments, Infection Control Departments, Employee Health Services, Infectious Disease Departments, Pediatrics, Director of Nursing, Medical Director, Dermatology, Laboratory Director and all patient care areas.

Summary

- Community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) infections have increased nationwide.
- Persons of all ages and those without underlying medical conditions can become infected with CA-MRSA.
- Skin and soft tissue infections (SSTIs) are the most common manifestation of CA-MRSA infections.
- CA-MRSA is a leading cause of SSTIs among patients referred for incision and drainage (I&D) procedures to Erie County infectious disease specialists.
- Providers should include CA-MRSA in the differential diagnosis of “spider bites” and “boils” whether or not they are accompanied by cellulitis.
- When possible, providers should collect specimens for bacterial culture and antimicrobial susceptibility testing when evaluating patients with SSTIs.
- Antimicrobial agent management should be determined based on the outcome of susceptibility testing results whenever possible; when susceptibility testing cannot be performed, providers should consider treating with a non-beta-lactam antibiotic effective against MRSA.

- Proper infection-control practices and appropriate antimicrobial agent management can help limit the emergence and spread of MRSA in the community and health care settings.
- Single cases of MRSA are not reportable; however, health care providers should be alert to any cluster or outbreak of skin infections and report them to the Erie County Department of Health (ECDOH).
- All cases of *S. aureus* due to strains showing reduced susceptibility or resistance to vancomycin (vancomycin-intermediate or -resistant *S. aureus*, VISA/VRSA) must be immediately reported to ECDOH.

Background

Staphylococcus aureus (*S. aureus*) is a gram-positive bacterium that can be found on the skin and in the nose of approximately 20% – 30% of healthy individuals. It is one of the most common causes for skin and soft tissue infections (SSTIs) in the United States and may also cause invasive disease, including surgical wound infections, bacteremia, pneumonia, necrotizing fasciitis, and toxic shock syndrome. During the past 50 years, treatment of *S. aureus* infections has become more difficult due to increasing antibiotic resistance.

Methicillin-resistant *Staphylococcus aureus* bacteria (MRSA) were first recognized in the 1960's and soon became identified as a source of infection in hospitals and other health care facilities. Beginning in the 1990's, there has been an increase in MRSA infections among persons who have onset in the community and who do not have health care facility exposure. This pathogen is referred to as community-associated methicillin-resistant *Staphylococcus aureus* or CA-MRSA. Since there is no nationwide surveillance system for CA-MRSA, the incidence and prevalence in the United States and in New York State are unknown at this time. The ECDOH is collaborating with area infectious disease specialists to establish a sentinel surveillance pilot project to determine the prevalence of CA-MRSA locally.

Until recently, reports of CA-MRSA outbreaks had been uncommon. However, nationwide and in New York State, outbreaks are being reported with increasing frequency in a variety of community settings, especially where there is close physical contact or close living conditions. Outbreaks have been reported among members of sports teams, children in day care centers, prisoners, injection drug users, men who have sex with men, military personnel living in a dormitory setting, and Native Americans. Frequent skin-to-skin contact between individuals, compromised skin surfaces, sharing of personal items that may become contaminated with wound drainage, contact with contaminated surfaces, and poor personal cleanliness and hygiene are factors that may increase the risk of CA-MRSA transmission.

The New York State Department of Health is advising health care providers about the growing number of CA-MRSA infections in persons of all ages who previously were considered to be at low risk for infection.

The information provided in this advisory is principally based on the report "*Strategies for Clinical Management of MRSA in the Community: Summary of an Experts' Meeting Convened by the Centers for Disease Control and Prevention*. March 2006."

Clinical Characteristics

The spectrum of disease caused by CA-MRSA appears to be similar to that of methicillin-susceptible *S. aureus* (MSSA). The severity of SSTIs varies from mild superficial infections to deeper soft-tissue

abscesses requiring hospitalization for surgical incision and drainage and delivery of intravenous antibiotics. The most common clinical manifestations are:

1. Abscesses/boils,
2. Carbuncles,
3. Cellulitis,
4. Folliculitis,
5. Furunculosis,
6. Impetigo, and
7. Infected lacerations.

Although CA-MRSA usually presents as a SSTI, it can also cause invasive disease. Invasive manifestations occur as complications of preceding SSTIs or viral respiratory tract infections (particularly influenza), as well as invasive disease without recognized preceding infections or risk factors.

Diagnosis and Testing

Whether caring for patients in a hospital or community setting, health care providers should:

- Consider MRSA in the differential diagnosis of SSTIs. A presenting chief complaint of "spider bite" should raise suspicion of a CA-MRSA infection.
- Consider MRSA in the differential diagnosis of other syndromes compatible with *S. aureus* infection, including sepsis, osteomyelitis, septic arthritis, and pneumonia that is severe or follows an influenza-like illness, as well as in other severe syndromes not normally associated with *S. aureus*, such as necrotizing fasciitis and purpura fulminans.
- Collect specimens for culture and antimicrobial susceptibility testing from patients with abscesses or purulent skin lesions, particularly those with either severe local infections, systemic signs of infection, or a history suggesting connection to a cluster or outbreak of infections among epidemiologically linked individuals. Appropriate clinical specimens include:
 1. Fluid from a purulent lesion or abscess cavity,
 2. Respiratory secretions (e.g., sputum, tracheal aspirations, bronchoscopic aspirations) or pleural fluid from a patient with pneumonia,
 3. Blood from a moderately or severely ill patient with signs and symptoms of systemic infection, or
 4. Other specimens from a normally sterile site suspected to be a focus of infection (e.g. joint or bone).

It is not necessary to routinely collect nasal cultures in all patients presenting with possible MRSA infection.

- Culture and susceptibility results are useful both for management of individual patients and to help determine local prevalence of *S. aureus* susceptibility to beta-lactam and non-beta-lactam agents.

Treatment

- Incision and drainage (I & D) is a primary therapy for furuncles, other abscesses, and septic joints. For small furuncles not amenable to incision and drainage or collection of material for culture, moist heat may be satisfactory to promote drainage.

- Patients with purulent skin lesions may also need antimicrobial therapy in addition to incision and drainage. Factors that may influence the clinical decision to supplement incision and drainage with antimicrobial therapy include:
 1. Severity and rapidity of progression of the SSTI or the presence of associated cellulitis,
 2. Signs and symptoms of systemic illness,
 3. Associated patient co-morbidities or immune suppression,
 4. Patient age,
 5. Location of the abscess, and
 6. Lack of response to initial treatment with incision and drainage alone.
- When empiric antimicrobial therapy is provided for treatment of an *S. aureus* SSTI infection, local laboratory susceptibility data should be used to guide treatment. A beta-lactam agent (anti-staphylococcal penicillin or cephalosporin) is still a reasonable option for first-line therapy in a patient with mild to moderate illness and no significant co-morbidities if the local prevalence of methicillin-resistance among community *S. aureus* isolates is low.
- Several antimicrobial agents have been proposed as alternatives to beta-lactams for outpatient treatment of SSTIs when an oral regimen with activity against MRSA is desired. These include clindamycin, tetracycline (including doxycycline and minocycline), trimethoprim-sulfamethoxazole (TMP-SMX), rifampin (used only in combination with other agents), and linezolid. There are advantages and disadvantages to each of these agents. More data are needed from controlled clinical trials to establish optimal regimens for the treatment of MRSA SSTI. Clinicians should consult product labeling for a complete list of potential adverse effects associated with a particular agent.
- Because of a relatively high prevalence of resistance among *S. aureus* isolates in the community or the potential for rapid development of resistance, some antimicrobial agents are not optimal choices for the empiric treatment of community-associated SSTIs possibly caused by *S. aureus*. These include fluoroquinolones and macrolides.
- Intravenous antimicrobial agents are appropriate for patients with severe staphylococcal infections, particularly patients requiring hospitalization. Consultation with an infectious disease specialist should be sought. Final therapy decisions should be based on results of cultures and antimicrobial susceptibility testing.
- Patients treated on an outpatient basis should be clearly instructed to return promptly if they develop systemic symptoms or worsening local symptoms, or if symptoms do not improve within 48 hours. A follow-up visit should be scheduled within 48 hours of the initial visit to confirm adequate response to therapy.
- Providers should consult with an infectious disease specialist if additional assistance is needed for clinical management of MRSA infections.

Decolonization Therapy

The association between MRSA colonization and infection and the role of decolonization in the clinical treatment of CA-MRSA infections still needs to be clarified. Nasal colonization with *S. aureus* has been identified as a risk factor for infection. MRSA colonization also occurs at sites other than the nose (e.g., pharynx, axilla, rectum, perineum), and may be important in development and transmission of infection, as well as in persistence or reappearance of colonization after use of nasal decolonization agents. The effectiveness of decolonization therapy of any kind for preventing *S. aureus* infections in individual patients has not been well established. There are few data on the effectiveness of decolonization regimens to eliminate colonization or prevent infection in community settings or within families. Compliance with decolonization regimens has been poor in some community settings. Additionally, development of

resistance to systemic and topical agents during decolonization therapy has been described, causing concern about widespread use of these interventions.

Prevention and Control

Intact healthy skin is a natural barrier for infection. Therefore, preexisting cuts, abrasions or other irritated areas can contribute to skin infections, as bacteria find an entry point in the broken skin.

Healthcare Setting:

- Enforce strict compliance with hand hygiene.
- Use standard infection control precautions for all patients in outpatient and inpatient healthcare settings. This includes:
 1. Performing hand hygiene (handwashing or using alcohol-based hand gel) after touching body fluids or contaminated items (whether or not gloves are worn), between patients and when moving from a contaminated body site to a clean site on the same patients.
 2. Wearing gloves when managing wounds.
 3. Wearing gowns and eye protection as appropriate for procedures that are likely to generate splashes or sprays of body fluids.
 4. Using contact precautions for patients with abscesses or draining wounds in which wound drainage cannot be contained.
 5. Carefully dispose of dressings and other materials that come into contact with pus, nasal discharge, blood, and urine.
 6. Clean examination room surfaces and patient rooms with an EPA-registered hospital detergent/disinfectant, in accordance with label instructions, or a 1:100 solution of diluted bleach (one tablespoon bleach in 1 quart of water).
 7. Use contact precautions for patients in acute care inpatient settings known or suspected to be infected or colonized with MRSA. This includes:
 - Greater spatial separation of patients (through placing infected patients in private rooms or cohorting patients with similar infection status),
 - Use gown and gloves for all contact with the patient or their environment, and
 - Use dedicated non-critical patient-care equipment.

Precautions may be modified as appropriate for ambulatory care and other non-acute care inpatient settings based on risk factors for transmission.

Household and Community Setting:

Patient education is a critical component of SSTI case management. To prevent spread of MRSA to others in the community, patients with MRSA, family members, household members, and close contacts should be counseled about the following control recommendations.

Patients with suspected or confirmed MRSA infections should:

1. Not pick, scratch, or squeeze pimples or boils.
2. Keep wounds covered, particularly those skin infections that produce pus.
3. Carefully dispose of soiled dressings/bandages. Heavily soiled bandages or dressings should be placed in a plastic bag before discarding into the trash. If not heavily soiled, they may be placed directly into the trash.

4. Refrain from sports or other activities that involve close contact if the patient cannot maintain adequate hygiene and keep wounds covered with clean, dry bandages during activity.
5. Wash clothes, towels, sheets, uniforms, etc. and any other soiled items using hot water, laundry detergent and dry on the hottest cycle after each use. Pre-wash or rinse any item that has been contaminated with body fluids.

Patients and their family, household members, and close contacts should:

1. Perform frequent handwashing with warm water and soap (preferably not bar soap), especially before and after touching or changing the dressing/bandage. Alcohol-based hand sanitizers may be used instead of soap and water, if hands are not visibly soiled. Whenever possible, dry hands with a paper towel and discard paper towel after use. If using clean disposable gloves to change a dressing/bandage, make sure that hands are washed before putting on and after taking off gloves.
2. Maintain a clean environment. Make sure to clean and disinfect surfaces and objects in the immediate environment and shared common areas that may have become contaminated with wound drainage or infected body fluids. Wipe surfaces with a commercial disinfectant or a 1:100 solution of diluted bleach (1 tablespoon bleach in 1 quart water), and allow to air dry.
3. Practice good personal hygiene including showering thoroughly each day and as soon as possible after physical activity, direct contact sports, or working out. Make sure to use a clean, dry towel.
4. Not share personal care items (i.e., razors, towels, bar soap, and water bottles).
5. Not share any topical preparations (i.e., ointments, balm, lotions, deodorants, antibiotic creams).
6. Not shave body skin for cosmetic or wound care reasons, as shaving can create micro-abrasions that can permit entry of bacteria.

Reporting

While single cases of MRSA are currently not reportable in New York State, any cluster or outbreak of MRSA or skin infections should be reported to the Erie County Department of Health at 716-858-7697.

In New York State, all cases of *S. aureus* due to strains showing reduced susceptibility or resistance to vancomycin (VISA/VRSA) must be immediately reported to the Erie County Department of Health at 716-858-7697. Since VISA/VRSA constitute a serious public health problem, all isolates showing reduced susceptibility to glycopeptides (e.g., vancomycin, teicoplanin) must be immediately submitted to the NYSDOH Wadsworth Center for confirmation and additional testing.

Additional Information

For further information, please call the Erie County Department of Health at 716-858-7697.

Information on MRSA and CA-MRSA can also be found on the CDC website at:

http://www.cdc.gov/ncidod/diseases/submenus/sub_mrsa.htm, the ECDOH website at www.erie.gov/health and the NYSDOH website at:

http://www.health.state.ny.us/diseases/communicable/staphylococcus_aureus/methicillin_resistant/fact_sheet.htm

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Health Category Definitions:

Health Alert FLASH: conveys the highest level of importance due to a large-scale, catastrophic public health emergency; warrants immediate action or attention

Health Alert Priority: conveys the highest level of importance; warrants immediate action or attention to a health problem or situation

Health Advisory: provides important information for a specific incident or situation; may not require immediate action

Health Update: provides updated information regarding an incident or situation; no immediate action necessary