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CA-MRSA lesions: What works, what doesn't

Incision and drainage are key, with antibiotics usually held in reserve; forego screening patients' household contacts

Practice recommendations

- Community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) abscesses are best managed surgically; postprocedure antibiotics do not substantially improve outcomes. Cure rates with incision and drainage alone are at least 90% (A).
- If incision and drainage fail to promote healing within 7 days, the oral antibiotics of choice are trimethoprim-sulfamethoxazole and tetracycline (C).
- Eradication of nasal carriage of CA-MRSA is generally not useful in preventing spread of clinical MRSA infections in communities (B).

Strength of recommendation (SOR)

- A Good quality patient-oriented evidence
- B Inconsistent or limited-quality patient-oriented evidence
- C Consensus, usual practice, opinion, disease-oriented evidence, case series

A previously healthy law student arrives at your office complaining of "abdominal pain." You discover on examination that she has an erythematous, indurated, and tender 3-cm lesion on her suprapubic region. The lesion has no point, but its center is boggy. The patient's temperature is normal. Would you give her an antibiotic? Would you cover immediately for community-

acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA)? What other factors might influence your decision?

The incidence of MRSA is increasing in communities across the United States, challenging our assumptions about evaluation and management of skin and soft-tissue infections. In this article, I outline a rational approach to managing patients who have lesions likely to have been caused by CA-MRSA (TABLE).

When to suspect MRSA skin infection

Patients with CA-MRSA skin infection often report a "spider bite," as lesions appear suddenly and unexpectedly in areas without a history of trauma.¹ The lesions very often are pustular with central necrosis, and there may be purulent drainage, redness, tenderness, and palpable fluctuance. CA-MRSA can cause impetigo, but the often benign nature of this clinical infection makes management decisions less crucial. CA-MRSA skin lesions can occur anywhere on the body, though most often they appear in the axillae or the groin and buttocks. Patients may or may not have a fever.

Individuals who are at increased risk for CA-MRSA disease include users of health clubs or participants in contact sports, men who have sex with men, chil-

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dren younger than 2 years of age, users of intravenous drugs, military personnel, and prisoners.^{2,3} However, the absence of these factors in a patient with a skin or soft-tissue infection does not rule out MRSA.⁴

Regardless of the lesion's appearance or the patient's epidemiologic history, consider CA-MRSA if its prevalence in your community reaches 10% to 15%.

Hospitalize any patient who exhibits fever or hypothermia, tachycardia greater than 100 beats per minute, or hypotension with a systolic blood pressure <90 mm Hg or 20 mm Hg lower than baseline. A skin lesion >5 cm is also likely to require hospitalization and parenteral antibiotics.⁵

■ **Treatment: Incision and drainage most important**

Several management schemes have been proposed to guide the appropriate level of therapy based on presenting patient characteristics.^{6,7} If a lesion is clearly fluctuant, incise it and drain the fluid, or refer the patient for surgical consultation. If the

lesion is not clearly fluctuant, needle aspiration may help to determine the need for more extensive incision and drainage or to collect a specimen for culture. Although culture of skin lesions may not have been routine in the past, the advent of CA-MRSA has made it so, particularly given that MRSA lesions may not be clinically distinguishable from those caused by nonresistant *S aureus*.

Periodic postprocedure follow-up is indicated to ensure resolution of the infection. At our health center, patients return every few days for an appointment with nursing staff for wound irrigation and packing change until the lesion visibly improves. Systemic effects from the infection are monitored, as well.

Adult patients in 1 study were treated with incision and drainage by a surgeon.⁸ The technique described in the article used an 11 blade and a "sawing motion," creating a wide opening. The wound cavity was explored for loculations and packed. This technique is identical to that used in the office. There is

CA-MRSA fast facts

- Community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) causes up to 74% of purulent skin and soft-tissue infections in communities throughout the United States.¹ By definition, this infection occurs in patients who have not been hospitalized and have not undergone medical procedures within the prior year.¹²
- The annual incidence of CA-MRSA was reported to be 18.0-25.7 cases per 100,000 population between 2001 and 2002.¹³ Clusters of CA-MRSA have been identified among Alaskan natives, Native American Indians, and Pacific Islanders.¹²
- Most often this organism causes skin and soft-tissue infections, though cardiac, respiratory, blood, and bone infections can also occur.¹⁴
- CA-MRSA species are genotypically distinct from hospital-acquired MRSA. One marker for CA-MRSA, Panton-Valentine leucocidin (PVL), is most often detected in cases of severe and systemic infection, and it may be a virulence factor.¹⁵ However, the presence of PVL does not necessarily



- correlate directly with antibiotic resistance.
- Historically, CA-MRSA was primarily resistant to beta-lactams and erythromycin. **More recent strains have also demonstrated resistance to tetracycline and clindamycin.**
- Retrospective analyses show that **patients with CA-MRSA tend to receive inadequate initial antibiotic coverage**, and, independent of this, they tend to have worse clinical outcomes than those infected by methicillin-sensitive strains.¹⁶

TABLE

Suspect CA-MRSA? Consider this treatment approach^{6,7}

CLASS	PATIENT CRITERIA	MANAGEMENT	ANTIBIOTIC CHOICES
1	Afebrile and healthy; lesion nonfluctuant	If no drainable abscess, give common first-line antibiotic for SSTI; reassess for response	Semisynthetic penicillin, oral first- or second-generation cephalosporin, macrolide, clindamycin
2	Fluctuant or pustular lesion <5 cm; with or without fever	Surgical drainage of abscess if possible. Use I&D presumptively for MRSA and monitor closely for response; inpatient management may be indicated	Trimethoprim-sulfamethoxazole, tetracycline, clindamycin
3	Toxic appearance or at least 1 unstable comorbidity or a limb-threatening infection; lesion >5 cm	Hospital admission with broad-spectrum antibiotics for MRSA coverage; consider infectious disease consultation	Broad-spectrum, including vancomycin
4	Sepsis syndrome or life-threatening infection (necrotizing fasciitis)	Above plus aggressive surgical debridement	Above with infectious disease guidance

CA-MRSA, community-acquired methicillin-resistant *Staphylococcus aureus*; I&D, incision and drainage; MRSA, methicillin-resistant *Staphylococcus aureus*; SSTI, skin and soft-tissue infection.

one caveat, though: This study included abscesses larger than 5 cm and patients with compromised immune systems—situations not routinely managed in the primary care office.

Are antibiotics indicated after incision and drainage for MRSA? In this same study, cure rates with incision and drainage alone were just over 90%.⁸ The cure rate in the treatment arm also receiving an antibiotic was 84% (difference was not statistically significant), and coverage was inadequate for MRSA. Treatment with cephalexin after incision and drainage resulted in 1 patient harmed for every 14 treated (NNH=14). A pediatric study also showed that antibiotics do not affect the outcome of skin lesions following incision and drainage.⁵ When deciding whether to prescribe postprocedure antibiotics, keep in mind the need to avoid contributing further to bacterial resistance.

Generally if incision and drainage fail to promote healing of the MRSA lesion within 7 days, start the patient on trimethoprim-sulfamethoxazole or tetracycline. Clindamycin is an option, though resistance to it is becoming more common. Adjust the antibiotic choice

as needed when culture and sensitivity results become available.

Trimethoprim-sulfamethoxazole is generally well tolerated at the recommended dose of 1 to 2 double-strength tablets (160 mg TMP, 800 mg SMX) twice daily for adults. If a patient's creatinine clearance is 15 to 30 mL/min, reduce the dose by half. The rate of sulfa allergy is similar to other antibiotics, at 3%.

Tetracycline's dosing schedule—for adults, 250 or 500 mg 4 times daily—makes it difficult to use. Gastrointestinal upset, phototoxicity, and hepatotoxicity can occur. The possibility of tooth discoloration precludes tetracycline's use in children.

Clindamycin carries a high rate of gastrointestinal-related problems, *Clostridium difficile* infection in particular (10% incidence administered in any route). Inducible resistance to clindamycin is 50% in MRSA infections.⁹ Recent use of antibiotics may increase the likelihood of clindamycin resistance, with erythromycin in particular inducing this resistance. Its dosage typically is 150 to 300 mg every 6 hours.

Doxycycline and minocycline are not recommended, as they carry a 21% failure rate.⁹

FAST TRACK

Regardless of the lesion's appearance, consider CA-MRSA if its prevalence in your community reaches 10% to 15%

Linezolid is costly and has many drug interactions. In particular, linezolid has the potential to cause serotonin syndrome with agents that affect the serotonergic system. Linezolid may also interact with medications that affect the adrenergic system (pressors). Its routine use in the community without infectious disease consultation is not advised.

For lesions that are not fluctuant or purulent, appropriate first-line antibiotics are semisynthetic penicillins (dicloxacillin), first- or second-generation oral cephalosporins, macrolides, and clindamycin.⁹ These antibiotics are preferable for group A streptococcal infections, erysipelas (which can be quite aggressive), and impetigo. Adjustments can be made as culture results become available or if the clinical response is inadequate. There is no particular utility in waiting to administer oral antibiotics in cases of erysipelas or impetigo, though topical antibiotics can often be used for limited cases of impetigo.

■ Prevention: Simple precautions are the rule

Most CA-MRSA infections result from direct contact with a patient's wound or from wound drainage on environmental surfaces.

In the medical office. In addition to using sterile technique during incision and drainage, be sure that all staff members wash their hands with soap and water or with an alcohol-based sanitizer. For the most part, MRSA remains susceptible to triclosan, a topical antiseptic in commercially available hand soaps.

Clean equipment as needed with 10% sodium hypochlorite solution or another agent effective against MRSA. Surgical instruments should be disposable or sterilized after each use.

At the patient's home. Instruct patients to clean wounds wearing fresh disposable gloves each time and to cover wounds with new, dry dressings. Tell families to avoid sharing linens and clothing unless they have been washed in hot soap and

water and dried in a heated dryer. MRSA can live for weeks to months on surfaces exposed to infected wounds,¹⁰ and these surfaces can be disinfected with a 10% bleach solution.

Sports environments. Athletes with CA-MRSA infections should not compete unless the wound can be completely covered with a dry dressing. Recommend to those in charge of school or commercial facilities that, in cases of confirmed MRSA infection, they routinely clean locker rooms and sports equipment with either a 10% bleach solution or commercial disinfectant. There is no evidence, however, that more widespread or vigorous cleaning—such as dismantling a training room and all its cardio-fitness equipment for disinfecting—prevents the spread of MRSA.

Encourage athletes to wash their hands properly. Communal towels should be washed in hot water (>140°F) with bleach before reuse. Personal equipment should be cleaned per the instructions of the manufacturer. Athletes should use a clean towel to provide a barrier between their skin and the surfaces of weight-room or cardio-fitness equipment. They should also clean equipment before and after use with an appropriate cleanser, such as a disinfectant hand-wipe.

Unproductive efforts you can avoid. Screening household contacts for MRSA is not useful, and attempts to eliminate colonization are generally ineffective. In a large military study, use of intranasal mupirocin failed to decrease nasal carriage of MRSA and the incidence of MRSA infections.¹¹ The MRSA nasal colonization rate was 3.9%; 121 individuals with MRSA colonization needed to be treated with nasal mupirocin to prevent 1 MRSA infection in the total study population.

More complex antibiotic regimens are sometimes used in an attempt to eradicate MRSA carriage, though they also have limited effectiveness and carry the general risks of antibiotic use (gastrointestinal disturbance, allergic reaction, etc). If your office is considering an eradication

FAST TRACK

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attempt, consult with an infectious disease clinician first. ■

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