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1. Background

New strains of methicillin-resistant *Staphylococcus aureus* (MRSA) have emerged in the community and sometimes cause aggressive infection in otherwise healthy people.⁽¹⁻⁹⁾ A recent meeting in BC confirmed that there has been broad emergence of MRSA in communities across the province over the last 12-24 months. (<http://www.bccdc.org/news.php?item=143>)

The following guidelines were developed collaboratively by the British Columbia Centre for Disease Control, the BC Association of Medical Microbiologists, BC Infectious Disease practitioners and the BC Provincial Infection Control Network.

The term, community associated-methicillin resistant *Staphylococcus aureus* (CA-MRSA) describes MRSA infections that appear to take their origin in the community. Many CA-MRSA infections are caused by unique clones of *S. aureus* that produce a toxin that may cause necrosis and leucopenia and may relate to key clinical presentations such as abscess and necrotizing pneumonia.

Some community associated strains are now found in association with hospital infections. Equally, some MRSA infections seen in the community remain clonally related to nosocomial isolates, suggesting spread of MRSA from the health-care setting.

2. Diagnosis

- MRSA (including CA-MRSA) should be considered in the differential diagnosis of any classical staphylococcal presentation.
- Complicated abscesses should be incised and the secretions sent for bacterial culture and sensitivity testing. (Note that most uncomplicated abscesses will resolve without antibiotic therapy. The culture of MRSA from an uncomplicated abscess is not an indication for antibiotics).
- All patients with systemic illness should have blood cultures taken.
- Current risk groups who have a higher risk of CA-MRSA include:
 - Persons with histories of intravenous drug use, homelessness or incarceration,
 - Some First nations populations
 - Those with close contact with individuals within these risk groups or with populations where CA-MRSA is endemic (some areas of the United States and some third world countries).



3. Susceptibility Patterns of MRSA

- All MRSA strains are resistant to cloxacillin, oxacillin, and cephalosporins (all generations).
- Hospital-associated MRSA strains are almost uniformly resistant to macrolides, clindamycin, gentamicin and quinolones and may be resistant to tetracycline and trimethoprim-sulfamethoxazole. They are uniformly susceptible to vancomycin, and linezolid.
- Community-associated MRSA strains are usually resistant to macrolides, variably susceptible to fluoroquinolones and usually susceptible to gentamicin, clindamycin, trimethoprim-sulfamethoxazole, tetracycline, fusidic acid and rifampin. They are also uniformly susceptible to vancomycin and linezolid^(10,11).
- Patterns of resistance can change and optimal therapy should be guided by knowledge of susceptibility pattern of the patient's isolate.

4. Management

The management of MRSA infection and colonization was recently reviewed in an Association for Medical Microbiology and Infectious Disease (AMMI Canada) position paper⁽¹²⁾.

- First, localized uncomplicated abscesses will generally not require antibiotic treatment. Drainage and local management are normally sufficient to attain resolution.
- The prevalence of MRSA in community-acquired *S. aureus* infections is not so high in most primary care settings that empirical choice of antibiotics should change. Cloxacillin and cephalexin remain drugs of choice where empirical oral therapy is considered in primary care. (This may vary by area so be alert to local guidelines).
- Should there be:
 - A failure to respond,
 - A susceptibility report indicating resistance to methicillin (and cloxacillin) or
 - If your local practice has a known high prevalence of MRSA,

the following should be considered:



- Antimicrobial therapy may be required for the following or other complicated presentations:
 - Abscesses of the scalp and face,
 - Large subcutaneous abscesses with constitutional symptoms and signs,
 - Cellulitis and necrotizing soft tissue infections,
 - Pneumonia, bone and joint infections,
 - Any infection in an immunocompromised host,
 - Patients who are toxic appearing on presentation
 - Those presenting with any form of invasive disease in addition to a skin and soft tissue infection.
- If indicated, antimicrobial treatment of CA-MRSA infections must be guided by knowledge of the laboratory susceptibility pattern. This is because susceptibility patterns vary among CA-MRSA but also because some infections diagnosed at community level involve hospital-associated strains which have a narrower spectrum of susceptibility.
- Options for treating CA-MRSA include:
 - Clindamycin
 - Trimethoprim-sulfamethoxazole
 - Doxycycline
 - Fusidic acid in combination with another agent-either doxycycline or rifampin
 - There is no consensus of opinion but some specialists favour therapy with two drugs to which the organism is susceptible. (e.g. clindamycin with rifampin, keep in mind that rifampin is a potent enzyme inhibitor and interferes with the metabolism of many other drugs)

Referral for specialist care should be considered in:

- Cases refractory to the above therapy
- Cases of invasive infection (e.g. bloodstream, pneumonia) and other presentations where parenteral therapy is considered
- Parenteral treatment options for MRSA infections include vancomycin and if susceptibility allows, trimethoprim-sulfamethoxazole, clindamycin, fusidic acid in combination with another agent- doxycycline or rifampin. Linezolid should be reserved for specialist care.

5. Decolonization of the Patient

Since efficacy data are lacking, and adverse effects including development of resistance are possible, decolonization is not generally recommended for usual management of CA-MRSA endemic infection or outbreak.



6. Prevention and Control

Health Canada recommends the use of routine practices for dealing with all patients regardless of their presumed infectious status ⁽¹³⁾. This means:

- Antibiotic resistant organisms are usually spread on the hands of health care providers. Hand washing or use of an alcohol-based hand antiseptic before and after contact with colonized or infected patients is the key to preventing transmission.
- Wearing a barrier (e.g. gloves) when it is anticipated the health care provider will come in contact with mucous membranes, open areas or body fluids.
- Wearing a gown if substantial soiling of the environment or close physical contact with the patient is anticipated.
- Wearing a surgical mask and eye protection if the patient has uncontrolled respiratory secretions and is coughing or sneezing.
- Ensuring patient care items and contaminated environmental surfaces are cleaned and disinfected between patients. This includes medical equipment (e.g. exam tables, chairs, stethoscopes) used in care for the client. In an ambulatory care center use of a hospital grade disinfectant is acceptable.
- Changing sheets between patients.
- Providing a regular cleaning schedule for the environment where clients are seen and there is a risk of a reservoir of antibiotic resistant organisms.

Clinicians should determine if household or other close contacts of the patient have staphylococcal soft tissue infection or other infections compatible with CA-MRSA and facilitate their evaluation and treatment if indicated.



7. Information for Patients:

Preventing the Spread of CA-MRSA at Home

- Keep wounds and lesions covered with clean, dry bandages. This is especially important if the wound is draining.
- Hand-washing often, with plain soap and warm water, especially if you change your bandages or touch the infected area or anything that might have come in contact with the infected area.
- Do not share personal items (e.g., towels, washcloths, razors, clothing, sports equipment) or other items that may have been contaminated by wound drainage.
- Wash soiled linens and clothes with hot water and laundry detergent. Drying clothes in a hot dryer, rather than air-drying, may also help kill bacteria in clothes.
- Wash utensils and dishes in the usual manner with soap and hot water or using a standard home dishwasher.
- Avoid contact sports or other skin-to-skin contact until the infection has healed.
- Be sure to tell any healthcare providers who treat you that you have a “resistant Staph infection”.



8. References

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Appendix 1

Management of Suspected *Staphylococcus aureus* Skin and Soft Tissue Infections (SSTI) for Primary Care Physicians

