Methicillin Resistant *Staphylococcus aureus*: Action-Oriented Guidance for Community-Based Prevention

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Feedback Poll
What do you know about MRSA?

A. I’ve never heard of MRSA.
B. I know a little about MRSA.
C. I know someone who has had MRSA.
D. I’ve diagnosed cases of MRSA.
What Is MRSA?

MRSA = Methicillin resistant *Staphylococcus aureus*

- Wound that **will not heal** caused by drug resistant *Staph. aureus*
  - Beta-lactams (ex: penicillins and cephalosporins)
  - Macrolides (ex: erythromycin, clarithromycin, azithromycin)
  - Fluoroquinolones / tetracyclines increasing in prevalence
What Is MRSA? (cont.)

• Guide to the elimination of MRSA transmission in hospital settings—APIC, 2007
  ▪ MRSA death rate 2.5x higher than methicillin-sensitive *S.aureus*
  ▪ MRSA HAI = $35,367 / case

• US HC $3.2–4.2 billion / year
  ▪ Up to 10 days longer hospitalization than MSSA
Community-Acquired MRSA

- Bacteriologic characteristics
  - Resistant to fewer antimicrobial classes
  - Different toxin genes (Panton-Valentine leukocidin)
  - Gene complex = Staph cassette chromosome mec (contains the methicillin-resistance gene)
    - SSCmec type IV and V
  - Small number of molecular strains identified by fingerprinting
  - Can survive on some surfaces for more than seven months
Patient Profile

- Outbreak groups
  - Inmates
  - Competitive sports participants
  - Military recruits
  - Child care attendees
  - MSM
  - Native Americans
- Most patients are not linked to an outbreak group
Spectrum of Disease

- Fever
- >80% skin and soft tissue infection (SSTI)
  - Abscesses
  - Furuncles
  - Carbuncles
  - Cellulitis
- Local swelling, redness, heat
- Painful lesion or pimple with or without drainage
- Misdiagnosed as spider bites
If you saw this lesion on the star high school football player's arm three days before the next game, what would you recommend?

A. Immediate medical evaluation and care
B. Cultures and antimicrobial sensitivity testing of any isolates of *Staph. aureus*
C. Consideration of restricting his playing in the game
D. All of the above
Spectrum of Disease

• Severe / invasive infection sites
  ▪ Lungs
  ▪ Bloodstream
  ▪ Bone
  ▪ Joints
  ▪ Surgical sites

• Complications of preceding SSTIs or viral respiratory tract infections (especially flu)
MRSA
MRSA: Direct Transmission

• Usually spread by physical contact
  - Hands
  - Wound
MRSA: Indirect Transmission

Touching of contaminated objects

- Sheets
- Towels
- Clothes
- Equipment
- Dressings
- Bar soap
- Personal items (ex: razor)
Community-Acquired MRSA

• Rapid emergence of CA-MRSA
• Patients presenting to emergency departments or clinics in increasing numbers
• Epidemiological definition
  ▪ Onset in the community
    • No recent hospitalization
    • No out-patient surgery
    • No residence in long-term care facility
    • No dialysis
    • No invasive medical devices
Colonization

• Nasal colonization = 0.8% (non-institutionalized individuals)

• Few data on the association between MRSA colonization and infection in the community

• MRSA colonization occurs:
  - Nose
  - Pharynx
  - Axilla
  - Rectum
  - Perineum

• Nasal colonization not always present in individuals with active MRSA infection
Colonization (cont.)

- Few data on the effectiveness of decolonization to prevent infection in the community or in families.
- Healthcare: intranasal mupirocin can be effective at eliminating colonization in the short term.
- Recolonization is common.
- Compliance is poor in community setting.
- Resistance develops to topical and systemic agents.
Current Study

- Washington State Department of Health North Central Region 7
  - Five counties:
    - Chelan
    - Douglas
    - Grant
    - Kittitas
    - Okanogan
  - Data sources:
    - 11 hospitals
    - 3 clinics
    - 2 labs
  - 2003–2006 medical records
Region 7 MRSA Trend

- Frequency
- Monthly
- 2003
- 2004
- 2005
- 2006
Region 7 MRSA Study: 2003–2006

Summary:
2049 cases  ●  47% female, 53% male  ●  Mean age = 43.8 years
Region 7 MRSA: In- vs. Outpatient

81.16% Inpatient
18.84% Outpatient
Region 7 MRSA: In- vs. Outpatient by Age

Number of Cases

Age Groups
- Children (0–10)
- Adolescents (11–20)
- Young adults (21–40)
- Mid adults (41–60)
- Older adults (60+)

Inpatient
Outpatient
Region 7 MRSA: Type by Age

Number of Cases

- SST
- Respiratory
- Blood
- Urine
- Nasal

Age Groups
- Children (0–10)
- Adolescents (11–20)
- Young adults (21–40)
- Mid adults (41–60)
- Older adults (60+)

The bar chart shows the number of MRSA cases by age group and type of sample. The highest number of cases is for SST in the young adult age group.
Antibiotic Resistance

“Awareness of local resistance patterns more important than categorizing community vs. hospital-acquired MRSA.”

CDC publication: *Strategies for Clinical Management of MRSA in the Community*
MRSA—Antimicrobial Resistance


<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>DOH</th>
<th>Region 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythromycin</td>
<td>96%</td>
<td>93%</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>82%</td>
<td>66%</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>26%</td>
<td>31%</td>
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<tr>
<td>Gentamycin</td>
<td>7%</td>
<td>3%</td>
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<tr>
<td>Rifampin</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Trimeth/ Sulfa</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>5%</td>
<td>7%</td>
</tr>
</tbody>
</table>
Region 7: Multiple MRSA Infections

Multiple Infections

Cases

Number of Infections

- 2: 171 cases
- 3: 34 cases
- 4: 7 cases
- 5: 3 cases
- >5: 2 cases
Patient Education

• Critical component of case management

• Patients that can’t maintain appropriate hygiene and keep wounds covered should be excluded from activities where close contact occurs:
  ▪ Child care
  ▪ Athletic practice
Patient Education: Treatment

• Incision and drainage (I&D) alone may be adequate therapy for some previously healthy patients with cutaneous abscesses and no systemic signs of infection.

• 90% success rate achieved for deep skin abscesses, with cellulitis, treated with I&D alone.
Protect Yourself: Personal Hygiene

• Wash hands thoroughly with soap and water.
• Use alcohol-based hand gel (>62%) if soap and water are not available.
• Take regular baths or showers.
• Do not share personal hygiene items.
Protect Yourself: Communal Contact

• Clean off communal surfaces with disinfectant.
• Shower after participating in close contact activities.
Protect Yourself: Wound Care

• Wash cuts, scrapes, lesions, insect bites, and sores with soap and water.
• Avoid contact with other people’s cuts and sores.
• Keep wounds clean and dry.
• Cover wounds with bandages until healed.
Someone Close to You Gets MRSA

• Do not touch another person’s wounds, infected skin, or soiled bandages with bare hands.

• Wash your hands frequently.

• Use alcohol-based hand gel (>62%) if soap and water are not available.
Someone Close to You Gets MRSA (cont.)

• Seek healthcare advice for any boils or new sores that are red or inflamed.

• Be alert for any skin infections following hospital discharge.
If You Have MRSA: Personal Hygiene

• Wash your hands frequently with soap and water.
• Use alcohol-based hand gel (>62%) if soap and water are not available.
If You Have MRSA: Relationships

- Tell your close contacts.
- Follow doctor’s orders.
If You Have MRSA: Laundry

• Wash contaminated clothes separately.
• Don’t allow dirty laundry to touch your clothes.
• Change sheets regularly.
  ▪ Wash with hot water / detergent
  ▪ Use hot dryer
If You Have MRSA: Wound Care

• Cover all “weeping” sores with a bandage.

• Change dressings when soiled or damp.
  ▪ Place old dressings in paper bag.
  ▪ Place bag in garbage.
  ▪ Wash your hands after every wound contact.
If You Have MRSA: House Cleaning

• Clean commonly touched surfaces in the home
  ▪ Door knobs
  ▪ Light switches
  ▪ Toilet handles
If You Have MRSA: No Pools!

• Avoid whirlpools, hydrotherapy pools, cold tubs, swimming pools if you have an open wound

• Wash your hands!
MRSA and Your Pet
Feedback Poll

Your community educational outreach about MRSA should focus on:

A. Schools
B. Childcare centers
C. Jails
D. All of the above
Prevention Is Most Important

The single most important thing you can do to prevent the spread of disease:

WASH YOUR HANDS!
References/Acknowledgements


• Brinsley-Rainisch K, et al. The general public’s awareness, knowledge, and perceptions of “staph”—with a focus on CA-MRSA. *Am J Inf Control* 2007:35(6);pp425-426

• Gorwitz RJ, and Participants in the CDC-Convened expert’s meeting on management of MRSA in the community. Summary of an expert’s meeting convened by the CDC 2006 [www.cdc.gov/ncidod/dhqp/ar_mrsa_ca.html](http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca.html)
References/Acknowledgements


• Living with MRSA www.tpchd.org

• MRSA fact sheet www.doh.wa.gov

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