MRSA in Correctional Facilities

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CA-MRSA Background

- Injection drug users - Detroit, 1980
  - Identified injection drug users as high risk\(^1\)

- Jail outbreaks

- Prisons

- SF County jail
  - MRSA increased from 29% of isolates in 1997 to 74% in 2002\(^2\)

\(^2\) Clin Inf Dis 2003; 37(10):1384
Georgia Prison 1

- 200 bed, short-term (90 days)
- Rate - 423 infections/1,000 offender-years
- Interventions
  - Screening for skin disease
  - Standard antibiotic recommendations
  - Inmate education
  - Alcohol-based hand rubs
- No cases for 8 months after interventions
- 94.3 infections/1,000 offender-years in next 6 months

MMWR 2003; 52(41):992-6
Inf Cont Hosp Epidemiol 2004; 25(5):402-7
Georgia Prison 2

- 1,500 bed, long term
- Rate - 60.4 infections/1,000 offender-years
- Risk factors
  - Previous antibiotic use
  - Self-draining of boils
  - Skin laceration
  - Washing clothes by hand
  - Sharing soap
  - Incarcerated in 2001 or later

MMWR 2003; 52(41):992-6
Georgia Prison 2

- **Initial Interventions**
  - “Appropriate” laundering
  - Improved access to wound care
  - Increased access to soap
  - Offender education

- **Later Interventions**
  - Cohorting of infected offenders
  - 5-day course of chlorhexidine soap for all offenders

- No sustained response to interventions seen
Mississippi Prison

- Risk Factors (multivariate analysis)
  - Sharing pillows or bed sheets (AOR = 40.6)
  - Touching another offender’s boil (AOR = 21.4)
  - Beta-lactam prescription within 1-12 months (AOR = 5.7)
  - Using state-issued soap (AOR = 5.0)
  - Self-reported insect bites (AOR = 4.2)

AOR = adjusted odds ratio

MMWR 2001; 50(42):919-22
Mississippi Prison

- Nasal Colonization with MRSA
  - Female - 5.9%, Male - 2.5%
- Risk factors for colonization (multivariate)
  - Housed in disability section
  - Picking/popping furuncles
  - Doctor visit in past year
  - Longer incarceration
Mississippi Prison

- Interventions
  - Improved surveillance
  - Optimized antibiotic recommendations
  - Reinforcing infection control practices in clinics
  - Offender education
  - Use of antimicrobial soap
Georgia jail

- 2,800 beds, average stay 25 days
- Rate
  - 13.7 infections/1,000 offender-years initially
  - 84.3/1,000 offender-years with case finding
- Inappropriate antibiotic use (beta-lactams) noted, even when MRSA cultured
- Interventions
  - Screening for skin infection
  - Standardized treatment regimens
  - Hygiene education for offenders
  - Changes in laundry practice

MMWR 2003; 52(41):992-6
Other jails

■ Tennessee
  ■ Associated MRSA infection with tattooing
  ■ Not associated with the tattooing apparatus
  ■ Contact with infected offenders after skin was broken by tattooing

■ LA County
  ■ Large numbers reported after surveillance started (46.1 - 77.6/1,000 offender-years)*

* MMWR 2003; 52(5):88
  MMWR 2003; 52(41):992-6
Staph Infections in TDCJ

MRSA  MSSA

Infections/1,000/year


*projected as of 6/30/04
TDCJ

- 149,424 Offenders
  - Prison - 104,430
  - State Jail and SAFP - 28,887
  - Transfer - 16,107
- 106 facilities
- About 1/3 population turnover/year
- 1-2% in transit on any given day
- Facilities are not air conditioned
### MRSA by Facility Type - 2002

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>MRSA Rate</th>
<th>MRSA Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer</td>
<td>56.5</td>
<td>74%</td>
</tr>
<tr>
<td>State Jail</td>
<td>53.1</td>
<td>79%</td>
</tr>
<tr>
<td>Prison</td>
<td>29.7</td>
<td>60%</td>
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</table>

Rate expressed as cases/1000 offender-years
Surveillance Jan-July 2004

- <1% of MRSA cases serious - pneumonia, sepsis, etc.
- 15% classified as “serious skin infection” or cellulitis
- 85% minor skin infections
- Females - 28.3 cases/1000 offender-years
- Males - 32.0 cases/1000 offender-years
Risk Factors - surveillance data (MRSA+MSSA)

- 4.6% of infections with known HIV status were HIV + (81% w/status known)
- 5.1% had diabetes mellitus
- 20% had a prior skin rash or lesion
- 2.9% had been hospitalized within 30 days

Rate of staph infections in 2002:
- HIV + - 163 infections/1000/year (MRSA=101)
- Diabetics - 82 infections/1000/year (MRSA=53)
- General Population - 74.5 infections/1000/year
Case-control study - MRSA

- Weak association with conviction in Harris County (OR 1.53, 95% CI 1.00-2.33)

- Associated factors:
  - School attendance
  - Previous skin infection
  - Close contact to case within 30 days

- No association with
  - Job assignment
  - Sharing soap, clothing, linen, grooming items
  - Recent tattoo
  - Recent medical encounter
Medical Risk Factors in TDCJ

- Offenders incarcerated 1999-2001
- Medical Alert Codes reviewed
- Increased risk of MRSA if
  - Female
  - Age < 30
  - Non-Hispanic white
  - State Jail or SAFP inmate

Clin Inf Dis 2004; 38:e92-5
<table>
<thead>
<tr>
<th>Condition</th>
<th>Rate</th>
<th>RR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circulatory</td>
<td>18</td>
<td>1.5</td>
<td>1.2-2.0</td>
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<tr>
<td>Cardiovascular</td>
<td>17</td>
<td>1.3</td>
<td>1.1-1.7</td>
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<tr>
<td>Diabetes</td>
<td>20</td>
<td>1.7</td>
<td>1.5-1.9</td>
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<tr>
<td>ESLD</td>
<td>24</td>
<td>2.0</td>
<td>1.4-2.9</td>
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<tr>
<td>ESRD</td>
<td>27</td>
<td>2.3</td>
<td>1.5-3.3</td>
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<tr>
<td>HIV/AIDS</td>
<td>32</td>
<td>2.6</td>
<td>2.3-3.0</td>
</tr>
</tbody>
</table>
Medical Risk Factors in TDCJ

- Overall risk for MRSA was 12 initial infections/1,000 offender-years
- No association found with skin disease
- Medical Alert Codes may be inaccurate
- Cannot r/o associations being a surrogate for frequent medical encounter
- 84% of infections not associated with any of the medical risk factors listed
## Nasal Colonization

<table>
<thead>
<tr>
<th>Facility</th>
<th>Nasal Carriers</th>
<th>Infection Rates*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MSSA</td>
<td>MRSA</td>
</tr>
<tr>
<td>A</td>
<td>30.5%</td>
<td>3.1%</td>
</tr>
<tr>
<td>B</td>
<td>33.0%</td>
<td>2.7%</td>
</tr>
<tr>
<td>C</td>
<td>15.1%</td>
<td>15.1%</td>
</tr>
<tr>
<td>D</td>
<td>25.8%</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

*Infections/1000/year
MRSA (and MSSA) Control in TDCJ

- Treat dermatitis promptly and aggressively
- Stress good hygiene with staff and offenders
- Culture draining lesions - diagnose early
- Treat appropriately
- Cover draining lesions or single-cell
  - Do not routinely isolate
Treatment

- Assure drainage is contained
- Assure adherence to therapy
- Empiric initial therapy trimethoprim/sulfa and/or clindamycin
What Hasn’t Worked

- Decolonization after first infection
- Cohorting
- Chlorhexidine for cohoorted offenders
- Frequent (TID) disinfection of common areas
- Not clear whether the intervention was ineffective or the implementation was inadequate
Total Staph Infections/month

- Triclocarban stopped
- Lab reporting
- Triclocarban resumed
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- Triclocarban resumed
- Lab reporting