Managing a Hidden Reservoir: Outbreak of Invasive Group A *Streptococcus* in a Skilled Nursing Facility

Presentation to: Council of State and Territorial Epidemiologists
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Group A *Streptococcus* (GAS)

- *Streptococcus pyogenes*
- **Characteristics**
  - Gram-positive cocci
  - Form chains
  - Wide range of presentations
- **Host**
  - Often carried on the throat & skin
- **Transmission**
  - Direct contact with mucus from the nose/throat of infected person
  - Contact with infected wounds/sores on skin
Epidemiologic Curve

Jan 2010
- Case finding
- Prevention recs

Nov 2011
- Facility-wide GAS screening
- Prophylaxis of carriers

June 2012
- Limited GAS screening
- Facility-wide prophylaxis
## Case Definitions

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Invasive GAS</th>
<th>Non-invasive GAS</th>
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</thead>
<tbody>
<tr>
<td>Resident of SNF</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>+ GAS culture</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Diagnosis after January 2009</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Isolation of GAS from a normally sterile site (e.g. blood, CSF)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Isolation of GAS from a non-sterile site (e.g. wound) &amp; clinical syndrome consistent with GAS infection</td>
<td></td>
<td>✓</td>
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**Recurrent cases:**
- >1 episode
- >1 month apart
Prior Investigation Findings

- 7 non-invasive cases
- Lapses in hand hygiene
- Infection associated with:
  - Being bedbound
  - Non-surgical wounds
  - Indwelling medical devices
  - Residence on Wing A
- Wound care nurse turnover
- Poor documentation of iGAS
- Screening cultures
  - 3 residents (same \textit{emm} type)
  - 1 staff member (different \textit{emm} type)
  - All were treated
Recommendations

Exit Meeting with SNFA senior staff:

1. Enhanced surveillance
2. Improve hand hygiene training and access
3. Revised sick leave policy
4. Require transferring hospital to complete Inter-facility Infection Control Transfer Form
Additional Cases

• No cases from Nov 2011- Feb 2012

• 4 new invasive cases between March 24 and May 19, 2012 (for a total of 15 invasive cases)
  – 3 previously GAS culture negative
  – 1 not in facility in November
  – No attributable deaths (1 later died of GI bleed)

• All *emm* type 11
  – Same *emm* type as previous cases
  – 3.4% of iGAS isolates in metro-Atlanta

• All same antibiotic sensitivity panel
Response to Outbreak Resurgence

• Contacted SNFA
  – Staff turnover
  – Ceased using transfer form after 3 months: Unaware of new cases

• Involved corporate nursing operations director
  – In-service on hand hygiene
  – In-service on transfer form

• Notified Healthcare Facility Regulation (HFR): Investigated as formal complaint

• Communications with CDC and health district
Interventions:

• Additional case finding
  – Obtained microbiology records from 2 referral hospitals
  – All positive GAS cultures in patients >40 yrs of age
  – Compared to SNFA census from just prior to the culture date
  – 2 non-invasive cases identified

• Antibiotic prophylaxis
  – Test and treat had failed
  – Cases rooms were spread throughout the facility
  – Decision made to treat all residents and staff
Treatment

- PCN IM injection + rifampin p.o. x 4 days (1st line)
- Keflex p.o. x 10 days (2nd line)

- If declined or antibiotics contraindicated:
  - Staff- OP swab & furloughed until swab negative
  - Resident- OP swab & contact precautions used (activities not restricted) until swab negative

- Close to new admissions during treatment
Pre-Treatment Culture Results

• Wound cultures
  – All non-surgical wounds
  – Some had multiple swabs
  – 4 positive cultures

• Oropharyngeal cultures
  – Residents who were GAS cases
  – Residents with positive screening cultures from previous investigation
  – All negative
<table>
<thead>
<tr>
<th>Facility Employees</th>
<th>Contracted Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient Care</td>
<td>• Physicians</td>
</tr>
<tr>
<td>• Administration</td>
<td>• Therapists</td>
</tr>
<tr>
<td>• Cafeteria</td>
<td>• Hospice</td>
</tr>
<tr>
<td>• Maintenance</td>
<td>• Dentists</td>
</tr>
<tr>
<td>• Replacement Staff</td>
<td>• Barber/Hairdresser</td>
</tr>
<tr>
<td></td>
<td>• Chaplains</td>
</tr>
</tbody>
</table>
## Prophylaxis

<table>
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<tr>
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<th>PCN/rifampin</th>
<th>Keflex</th>
<th>Swab</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residents</strong></td>
<td>157 (75%)</td>
<td>47 (22%)</td>
<td>5 (2%)</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-house</td>
<td>181 (80%)</td>
<td>40 (18%)</td>
<td>5 (2%)</td>
</tr>
<tr>
<td>Contracted</td>
<td>21 (40%)</td>
<td>4 (8%)</td>
<td>27 (52%)</td>
</tr>
</tbody>
</table>

*Facility administered and strongly promoted PCN/rifampin to employees
*Keflex administered through modified DOT system

(2 allergies 3 refusals)
Test of GAS Eradication

• Repeat swabs 1 month after treatment on:
  – Prior cases
  – Positive wounds
  – Admissions during treatment
  – Antibiotic refusals

• All negative
Other Changes

• Facility
  – New executive director with microbiology experience
  – New Director of Nursing
  – Hired Infection Control Consultant

• GDPH
  – Screen monthly for iGAS cases in long term care facilities
  – Send letters and guidelines to long term care facilities with 1 case
  – Maintain list of facilities with a case to identify facilities with >1 case in a 90 period
NO FURTHER CASES HAVE OCCURRED AT THE FACILITY SINCE MAY 2012
Summary

- Prolonged (36 months) outbreak of GAS in a SNF with:
  - high case fatality rate
  - high rate of recurrence
  - all emm type 11

- Poor communication between SNF and referral hospitals caused difficulty in facility recognition of cluster

- Assertive facility-wide prophylactic antibiotic treatment was necessary to stop this outbreak of invasive GAS

- All residents and staff were targeted for treatment

- High treatment rates were achieved through partnership with clinical and administrative leadership of the SNF

- No further iGAS cases have occurred in >12 months
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Questions?

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