MRSA point prevalence survey – March 2013 – Surgical wards

Background

- HA-MRSA 13 of 58 (22%)
- MRSA positive 22 of 58 (38%)
- Not tested
MRSA point prevalence survey – March 2013 – Surgical wards

Patient isolates by genotype
- 280845
- 280841
- 13184
- 13185
- 78720
- 289165
- 144261
- 12928
- 14208
- 37248

HA-MRSA
Known MRSA
› High incidence of infections
› Difficult to determine transmission sources, transmission pathways
› Difficult to conduct targeted and efficient infection control
› Blanket infection control strategies
› Costly, time and resource intensive

Aim: Timely and efficient outbreak investigation and management
Current situation
Current situation

Apply Informatics!
What is informatics?

The way we:

› collect, store, and access data
› transform data into useful information
› use this information to inform actions
   - here, infection control actions.
Automated MRSA Outbreak Detection System

Data

› Health information exchange (HIE) database
› Hospital patient information systems
› Pathology database
› Infection control management system
› MRSA genotype database
› Cleaning logs
Automated MRSA Outbreak Detection System
Information produced

› Notification of individual MRSA transmission events
› Likely locations where MRSA transmission may have occurred
› Likely sources for MRSA transmission
   - other patient/s
   - health care worker/s
   - environment
› Ranks the sources of transmission
   - admitted to the same bed as an MRSA patient (without a terminal clean in between)
   - in the same room
   - has the same medical team
   - in the same ward
   - in the hospital
   (the same time or two weeks prior to admission of HA-MRSA patient)
Actions taken

Immediate actions

› Identify and address breeches in infection control
  - Bed cleaning
  - Patient and staff education
  - Patient management e.g. single bed room

Long term actions

For reoccurring situations that cause outbreaks:

› Policy/process changes e.g. terminal cleans for beds occupied by patient found to be MRSA positive after discharge

› New policies e.g. patient education and communication
Transmission pathways (genotype 280845)
Transmission pathways (genotype 280841)
Transmission pathway (genotype 13184)

Transmission pathway (genotype 13185)

Transmission pathway (genotype 78720)
Results

Environment contamination

8% (12 of 144) MRSA positive (after cleaning)

handsets, patient curtain, bedside table, trolley, nurse station, procedure room curtain

Environmental isolates

- 280845
- 280841
- 13184
- singleton
Results

MRSA transmission pairs

2 patients in same bed consecutively

Patient isolates by genotype
- 280845
- 280841
- 13184
- 13185
- 78720

Environmental isolates
- 280845
- 280841
- 13184
The 13 HA-MRSA patients

<table>
<thead>
<tr>
<th></th>
<th>Entire stay</th>
<th>Surgical wards</th>
<th>Emergency</th>
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<tbody>
<tr>
<td>Avg. no. possible transmission sources</td>
<td>8 (range 1 – 15)</td>
<td>4.7</td>
<td>4</td>
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<td>(same ward, same time or up to 2 weeks prior)</td>
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<tr>
<td>Avg. no. possible ward locations where transmission occurred</td>
<td>3 (range 1 – 6)</td>
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<tr>
<td>Avg. exposure duration</td>
<td>2 days 13 hours</td>
<td>1 day 22 hours</td>
<td>4 hours</td>
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<td>(same ward, same time)</td>
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(n.b. consistent with 4 hour ED admission target)
Next steps

- Evaluation of automated MRSA outbreak detection system
- Manual investigation of situations not captured by system
- Routine transmission information for ICPs
- Ward transmission analysis
- MRSA genotype transmissibility
- MRSA genotype population dynamics
- Whole Genome Sequencing
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Questions

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