SAB Surveillance at the Princess Alexandra Hospital

‘Preventability’: our approach and findings

Naomi Runnegar
Overview

• Life in Queensland and PAH

• SAB Surveillance at PAH
  – Assessment of ‘preventability’
  – Feedback to clinicians
  – Proportion preventable
  – Impact of above on SAB rate
Recent events in Queensland that could effect SAB surveillance

- Queensland Health decentralised into 14 ‘Hospital and Health Services’ (HHSs)
- A QH KPI of 80% reduction in HA-BSI was introduced (then retracted)
- Negative financial adjustments for healthcare-associated bloodstream infections
  - $12 500 per Criterion 1 BSI episode above the lower quintile rate for peer grouped hospitals
Metro South HHS

- Most populated HHS
  - > 1 million 2011
  - 23% of population of Qld

- 27% born overseas
  - 42% speak a language other than English at home

- 2% Indigenous
Princess Alexandra Hospital

- 800 bed Tertiary hospital
- State centre for
  - Renal and liver transplantation
  - Spinal injury acute care and rehabilitation
  - Brain injury rehabilitation
- Not provided
  - O&G
  - Paediatrics
  - Allo HSCT
  - Burns care
CHRISP HA-BSI Surveillance Classification

- All HA-BSI followed
- Diagnosis Criterion
  - Diagnosis Criterion 1: isolate is ‘confirmed pathogen’
  - Diagnosis Criterion 2/3: ‘common commensal’ in >1/<1 yo
- Acquisition
  - Community / maternally acquired
  - Healthcare-inpatient
  - Healthcare-non-inpatient
- ‘Focus’
  - Neutropenia-associated
  - Specific organ site-associated
    - +/- SSI, procedure, implanted or indwelling device associated
  - IVD-associated
  - Unknown or Disseminated
Recent Infection Control Interventions at the PAH
Vascular Access Surveillance Team (VAST)

- Replaced IV cannulation service Dec 2012
- Policy, Education, Audit, e.g.
  - Quarterly hospital-wide IVD audits & feedback
  - Training nurses and junior doctors re: PIVC insertion
  - ED education re: PIVC insertion
  - Regular audit and feedback re: redundant PIVCs
  - Formal credentialing of junior doctors for PIVC insertion
Bloodstream Infection Meeting

- ICP, VAST, IC scientist, micro, IDP, IDAT
- Weekly for 30 mins to 1 hour
- SAB November 2011
- all HA-BSI May 2012

- Agree on surveillance classification
- Determine whether preventable contributors were present or more investigation required
- Write feedback letter to clinicians
Process for determining ‘preventability’
Our approach to preventability

• Look for “preventable potential contributors”
• Defined as identifiable non-compliance with relevant existing hospital procedures or other accepted guidelines
  • ~Established management protocols not adhered to Kok JHI 2011;79:108-14.
• Evolved over time
• Currently a standard checklist
  – Most review carried out by VAST, ICPs and clinical ID team as a component of routine work
### IVD-associated BSI

<table>
<thead>
<tr>
<th>Condition</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-compliance with aseptic non-touch technique for insertion of IV device (IVD)</td>
<td>Y / N / n/a / UTA</td>
</tr>
<tr>
<td>Non-compliance with aseptic non-touch technique for manipulation of IVD</td>
<td>Y / N / n/a / UTA</td>
</tr>
<tr>
<td>IV device left in situ without a clear indication</td>
<td>Y / N / n/a / UTA</td>
</tr>
<tr>
<td>IV device left in situ with evidence of infection or inflammation (before BSI)</td>
<td>Y / N / n/a / UTA</td>
</tr>
<tr>
<td>IV device not removed or changed in recommended timeframe</td>
<td>Y / N / n/a / UTA</td>
</tr>
<tr>
<td>PIVC inserted in an emergency situation or at another facility and not removed within 24h</td>
<td>Y / N / n/a / UTA</td>
</tr>
<tr>
<td>Inadequate documentation on the IV devices log or care plan</td>
<td>Y / N / n/a / UTA</td>
</tr>
<tr>
<td>Non-compliance with mupirocin procedure in a haemodialysis patient</td>
<td>Y / N / n/a / UTA</td>
</tr>
</tbody>
</table>

**Hospital procedures and CHRISP I-CARE guidelines**

**TPN:** Y / N / n/a / UTA  
**Heparin:** Y / N / n/a / UTA  
**Dialysis Centre:**

**Site clinically infected?** Y / N / UTA

### Organ Site Focus – Procedure, Implanted Device or SSI-related

**Procedure:** ____________________________  
**Surgeon/Proceduralist:** ____________________________  
**Antibiotic Prophylaxis:** Drug/dose: ____________________________  
**Before incision:** Y / N

**Prophylaxis for surgery or procedure not consistent with guidelines:** Y / N / n/a / UTA

**Local surgical prophylaxis guidelines or TG:Antibiotic**

### Organ Site Focus – IDC-associated

**Indication for IDC:**
- [ ] Acute urinary retention or obstruction
- [ ] Monitoring U/O in critically ill
- [ ] Healing of wounds (sacral/perianal) in incontinent patients
- [ ] Prolonged immobilisation (e.g. unstable spine, pelvic trauma)
- [ ] Exceptional circumstances e.g. end of life care

**Peri-op (selected procedures):**
- [ ] Urological or of contiguous structures of GUT
- [ ] Prolonged duration of surgery (removed in recovery)
- [ ] Large volumes of infusions or diuretics administered intra-operatively
- [ ] Urinary incontinence
- [ ] Need for intra-op monitoring of output

**ASID (HICSIG)/AICA Position Statement:** Preventing CAUTI  
*HI* 2011;16:45-52.

### Any BSI

**Delayed diagnosis or treatment of infection at another site:** Y / N / n/a / UTA

**New acquisition of a multi-resistant organism during this admission:** Y / N / n/a / UTA

**Kok et al JHI 2011;79:108-14.**
Feedback to clinicians

• Formulate a feedback letter based on assessment re: preventable contributors
• all HA-BSI episodes other than neutropenic sepsis
• to relevant consultant and NUM by email
  • +/- ICU, Radiologist, Surgeon/Proceduralist
• Not filed in patient notes
• Feedback invited from treating team
• Excel + mail merge to word template
Feedback letter

Healthcare-associated
Bloodstream Infection (BSI)
Surveillance Feedback form

This form is to provide feedback to you regarding Infection Management Services’ evaluation of a healthcare-associated BSI in a patient who you have been involved in the care of.

<table>
<thead>
<tr>
<th>Patient BSI Episode</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>org. 1</td>
</tr>
<tr>
<td>Consultant</td>
<td>Unit</td>
</tr>
<tr>
<td>Also sent to:</td>
<td></td>
</tr>
<tr>
<td>Infection Control Surveillance Classification:</td>
<td></td>
</tr>
<tr>
<td>Acquisition</td>
<td></td>
</tr>
<tr>
<td>Focus</td>
<td></td>
</tr>
<tr>
<td>Associated with</td>
<td></td>
</tr>
</tbody>
</table>

Evaluation of Preventable Contributors to BSI

No preventable contributors were identified.

<table>
<thead>
<tr>
<th>Intravascular device-associated BSI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-compliance with aseptic non-touch technique for insertion of IV device (IVD)</td>
<td></td>
</tr>
<tr>
<td>Non-compliance with aseptic non-touch technique for manipulation of IVD</td>
<td></td>
</tr>
<tr>
<td>IV device left in situ; without a clear indication</td>
<td></td>
</tr>
<tr>
<td>IV device left in situ; with evidence of infection or inflammation [before BSI]</td>
<td></td>
</tr>
<tr>
<td>IV device not removed or changed in recommended timeframe</td>
<td></td>
</tr>
<tr>
<td>PIVC inserted in an emergency situation or at another facility and not removed within 24 h</td>
<td></td>
</tr>
<tr>
<td>Inadequate documentation on the IV devices log or care plan</td>
<td></td>
</tr>
<tr>
<td>Non-compliance with aseptic non-touch technique for insertion of IV device (IVD)</td>
<td></td>
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<tr>
<td>Non-compliance with aseptic non-touch technique for manipulation of IVD</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>IV device left in situ; with evidence of infection or inflammation [before BSI]</td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
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<tr>
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<tr>
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<tr>
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<td></td>
</tr>
<tr>
<td>IV device not removed or changed in recommended timeframe</td>
<td></td>
</tr>
<tr>
<td>PIVC inserted in an emergency situation or at another facility and not removed within 24 h</td>
<td></td>
</tr>
<tr>
<td>Inadequate documentation on the IV devices log or care plan</td>
<td></td>
</tr>
</tbody>
</table>

Current PAH Hand Hygiene compliance for moment 2 (i.e. before a procedure) 50%

PA Procedures: 05555 PIVC Insertion and Care, 05505 Management of CVADs, CHIRP I CARE

Other BSI

- Prophylaxis for surgery or procedure not consistent with guidelines
- Delayed diagnosis or treatment of infection at another site
- New acquisition of a multi-resistant organism during this admission

N/A Not applicable; UTA unable to assess

Comment

Your Feedback To Us (optional)

You may print and post or fax this form, or respond by email.

Patient | BSI Date
---|---
Were there any preventable contributors to this BSI that were not identified in this evaluation?

Can you suggest any system changes that could prevent a similar episode in the future?

Do you disagree with the evaluation or have any other comments?

Completed by:

Information about Healthcare associated BSI Surveillance

This form is to provide feedback to you regarding Infection Management Services’ evaluation of a healthcare-associated BSI in one of your patients. You do not need to act on this information. However, if a preventable BSI has occurred we encourage you to disseminate this information to your team and consider whether processes could be changed to reduce the risk of a similar episode in the future.

Up to 30% of healthcare associated BSIs are preventable. We are working towards a reduction in the incidence of preventable BSIs at PAH.

It is mandatory for infection control to report BSI rates externally and S. aureus BSI rates are reported publicly on the Myhospitals and Queensland Government Hospitals Performance websites.

Please note, BSI surveillance definitions are standardised to ensure consistent data collection over time. They may not always exactly align with your clinical assessment; however your feedback regarding the accuracy of the classification is always welcome.

Quality Improvement

The Venous Access Surveillance Team (VAST) are available to answer queries and provide in-services or other education regarding the insertion and management of IV devices. Phone 3176 5795, email VAST@health.qld.gov.au or page 530,105 or 1116.

For concerns regarding BSIs not related to IV devices, contact Infection Control on 3176 5920 or email infect@health.qld.gov.au.

Other Contact

You are also welcome to discuss this information with Dr Naomi Bunnage, phone 3176 7177 or 0422 393 117.
Feedback on feedback letters

- Last 18 months 312 letters sent
- 27 responses received (9%)
Specific Feedback when problems identified

• Renal unit non-compliance with mupirocin procedure (high risk S. aureus colonised HD patients)

• ERCP prophylaxis in patients not under gastroenterology team

• Post-TRUS biopsy sepsis rates after change in surgical prophylaxis
Findings
How many HA-SAB have preventable potential contributors?

<table>
<thead>
<tr>
<th>BSI Focus</th>
<th>sub-classification</th>
<th>No Preventable contributor identified</th>
<th>Preventable contributor identified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutropenic Sepsis</td>
<td></td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Organ Focus (n=48)</td>
<td>SSI</td>
<td>9</td>
<td>9 (50%)</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Procedure</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Implanted Device</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Indwelling Device associated</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>ICU VAP</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>17</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>Intravascular Device Associated</td>
<td>PIVC</td>
<td>5</td>
<td>22 (81%)</td>
<td>27</td>
</tr>
<tr>
<td>(n=79)</td>
<td>ICU CLABSI</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>non-ICU, non-HD CLABSI</td>
<td>23</td>
<td>5 (18%)</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>HD CLABSI</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>HD AVF/AVG</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Unknown</td>
<td></td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>86</td>
<td>53 (38%)</td>
<td>139</td>
</tr>
</tbody>
</table>
Preventable contributors identified

<table>
<thead>
<tr>
<th>Preventable contributor</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate documentation on the Invasive Devices Log or Vascular Access Device Care Plan</td>
<td>12</td>
</tr>
<tr>
<td>Antibiotic prophylaxis for surgery or procedure not consistent with guidelines</td>
<td>9</td>
</tr>
<tr>
<td>IVD not removed or changed in recommended timeframe</td>
<td>8</td>
</tr>
<tr>
<td>IVD left in situ after evidence of infection (before BSI)</td>
<td>7</td>
</tr>
<tr>
<td>IVD left in situ without IV therapy prescribed</td>
<td>7</td>
</tr>
<tr>
<td>Haemodialysis patient eligible for, but not given mupirocin</td>
<td>7</td>
</tr>
<tr>
<td>PIVC inserted in an emergency situation, by QAS or at another facility and not removed within 24 hours</td>
<td>6</td>
</tr>
<tr>
<td>Delayed diagnosis or treatment of infection at another site</td>
<td>4</td>
</tr>
<tr>
<td>Any other contributor that may be prevented by improved systems or processes or compliance with existing guidelines</td>
<td>4</td>
</tr>
<tr>
<td>New acquisition of a multi-resistant organism during this admission</td>
<td>3</td>
</tr>
<tr>
<td>Non-compliance with aseptic non-touch technique for insertion of IVD</td>
<td>2</td>
</tr>
<tr>
<td>Non-compliance with aseptic non-touch technique for manipulation of IVD</td>
<td>0</td>
</tr>
</tbody>
</table>
HA-SAB (n=139): 38% Preventable contributor identified
Non-SAB Criterion 1 HA-BSI (n=446): 14% Preventable contributor identified
Outcomes: SAB rates
Ipswich + PAH non-inpatient HD-SAB: improved since feedback
PAH non-inpatient HA-SAB

Princess Alexandra Hospital Non-Inpatient Healthcare Associated SAB
GAM chart from Jan 2002 to Jun 2014.

Data blue, Fitted GAM red, 95% CI brown, Control limit black.

Seasonal Trend Test p-value 0.7206
Inpatient HA-SAB: MSSA

Princess Alexandra Hospital Inpatient Healthcare Associated MSSA BSI GAM Chart from Aug 2001 to Jun 2014.

Rate per 10000 OBD

Seasonal Trend Test p-value 0.008

Data blue, Fitted GAM red, 95% CI brown, Control limit black.
Princess Alexandra Hospital Inpatient Healthcare Associated MRSA BSI
GAM Chart from Jan 1995 to Jun 2014.

Seasonal Trend Test p-value < 0.001

Rate per 10000 OBD


Data blue, Fitted GAM red, 95% CI brown, Control limit black.
Princess Alexandra Hospital Inpatient PIVC Associated SAB
GAM Chart from Aug 2001 to Jun 2014.

Rate per 10000 OBD

Seasonal Trend Test p-value 0.6891

PIVC-associated SAB: No change

0.26 / 10 000 OBD July 11-Jun 14
(0.26 / 10 000 OBD Monash/Austin  Stuart MJA 2013;198:551-553.)
# IV Device Audits - VAST

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PIVC</td>
<td>236 (81%)</td>
<td>224 (79%)</td>
<td>207 (77%)</td>
<td>208 (78%)</td>
<td>222 (77%)</td>
<td>167 (75%)</td>
<td>230 (77%)</td>
</tr>
<tr>
<td>PICC</td>
<td>38 (13%)</td>
<td>40 (14%)</td>
<td>45 (17%)</td>
<td>40 (15%)</td>
<td>42 (14%)</td>
<td>38 (17%)</td>
<td>53 (18%)</td>
</tr>
<tr>
<td>Short term CVL</td>
<td>10 (4%)</td>
<td>11 (4%)</td>
<td>7 (3%)</td>
<td>7 (3%)</td>
<td>9 (3%)</td>
<td>8 (3%)</td>
<td>7 (2%)</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>13</td>
<td>16</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>291</td>
<td>284</td>
<td>269</td>
<td>268</td>
<td>289</td>
<td>221</td>
<td>299</td>
</tr>
<tr>
<td>Dressing intact</td>
<td>237 (81%)</td>
<td>242 (85%)</td>
<td>229 (85%)</td>
<td>253 (94%)</td>
<td>272 (94%)</td>
<td>208 (94%)</td>
<td>261 (87%)</td>
</tr>
<tr>
<td>Dressing secure</td>
<td>233 (80%)</td>
<td>243 (85%)</td>
<td>236 (88%)</td>
<td>252 (94%)</td>
<td>265 (92%)</td>
<td>208 (94%)</td>
<td>265 (89%)</td>
</tr>
<tr>
<td>PIVC No identified use</td>
<td>44 (18.5%)</td>
<td>47 (21%)</td>
<td>44 (21%)</td>
<td>57 (27%)</td>
<td>35 (15.5%)</td>
<td>26 (15.5%)</td>
<td>40 (17%)</td>
</tr>
</tbody>
</table>
Conclusion

- At PAH nearly 40% of HA-SAB have detectable preventable contributors
- Assessment of preventability can be sustainably integrated into routine surveillance if simple and focussed
- Useful for identifying specific areas for intervention
- Feedback re: individual episodes yet to impact on outcomes at PAH
- PIVCs a prominent problem
Acknowledgements

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Joel Douglas

Dr Nicola Townell
Dr James
Dr Evan Bursle
Dr Shradha Subedi

Dr Kylie Alcorn
Dr Lily Dang
Dr Letitia Gore

Dr Lana Sundac