Antimicrobial Stewardship: Pharmacist perspective

Tony Lai
AMS pharmacist CHW
September 2017
CHW AMS team

CHW Antimicrobial Stewardship AMS Team
Tony Lai, Alex Outhred, Sofia Badran, Alison Kesson, Shobini Sivagnanam, Julie Huynh and Laila Al Yazidi (Absent: Phil Britton)
AMS program since 2008

Essential AMS strategies (ACSQHC):

- Formulary restriction and approval system
- Implement clinical antibiotic guidelines
- Review antimicrobial prescribing with direct feedback and intervention
  - Intensive care (PICU/NICU) ward round
  - Oncology AMS ward round
  - CEC 5x5 audit
- Education
- Monitor performance of antimicrobial prescribing
Cost avoidance reports

Table 1: Annual expenditure and cost avoided attributable to the AMS Program at CHW

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of antimicrobials*</th>
<th>Cost avoided</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$1,802,686</td>
<td>$563,282</td>
</tr>
<tr>
<td>2009</td>
<td>$1,743,065</td>
<td>$786,249</td>
</tr>
<tr>
<td>2010</td>
<td>$2,279,841</td>
<td>$412,818</td>
</tr>
<tr>
<td>2011</td>
<td>$1,845,752</td>
<td>$1,010,253</td>
</tr>
<tr>
<td>2012</td>
<td>$1,633,972</td>
<td>$1,385,378</td>
</tr>
<tr>
<td>2013</td>
<td>$2,637,312</td>
<td>$545,384</td>
</tr>
<tr>
<td>2014</td>
<td>$2,315,152</td>
<td>$1,030,889</td>
</tr>
<tr>
<td>2015</td>
<td>$2,605,667</td>
<td>$903,720</td>
</tr>
<tr>
<td>2016</td>
<td>$2,815,538</td>
<td>$857,195</td>
</tr>
<tr>
<td>Cumulative cost avoided due to AMS program</td>
<td>$7,495,168</td>
<td></td>
</tr>
<tr>
<td>Average cost avoided per annum</td>
<td>$832,796</td>
<td></td>
</tr>
</tbody>
</table>

*excluding hospital in the home antimicrobials

Figure 2: Annual expenditure and cost avoided attributable to the AMS Program at CHW
AMS program since 2008

Essential AMS strategies (ACSQHC):

- Formulary restriction and approval system
- Implement clinical antibiotic guidelines
- Review antimicrobial prescribing with direct feedback and intervention
  - Intensive care (PICU/NICU) ward round
  - Oncology AMS ward round
  - CEC 5x5 audit
- Education
- Monitor performance of antimicrobial prescribing

ABS 4 kids
Antibiotic Stewardship 4 kids
Febrile Neutropenia Power Plan

1st line empirical abx
2nd line empirical abx
Fluids Pathology Imaging
# eMM Power Plans

## Appendicitis Power Plan

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Analgesia</th>
<th>Imaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>MENINGITIS</td>
<td>PNEUMONIA</td>
<td>UTI</td>
</tr>
<tr>
<td>INTRA-AB</td>
<td>CELLULITIS</td>
<td>SEPSIS KILLS</td>
</tr>
</tbody>
</table>

1. **1st line empirical abx**
2. **2nd line empirical abx**

**Pathology Analgesia Imaging**
Surgical Power Plan

Single dose cephazolin (up to 24 hours)*

Analgesia
Anti-emetics
Fluids
Pre eMM

- AMS ward rounds, audits, post prescription review, and feedback
- Limited to:
  - Med charts and notes
  - Online approval systems
  - iPharmacy dispensing data

Enter eMM
Single source of Truth

• MAR: Medication administration record
• 8 am every morning I get an automated email with an excel spread sheet:
  – **EVERY** inpatient prescribed an antimicrobial due for a dose that morning*
AMS ward rounds with eMM
“Virtual AMS Ward rounds”

- Source: (MAR) Medication Administration Record
  - Patient MRN, DOB, sex,
  - Ward
  - Antimicrobial prescribed
    - Dose, frequency
    - Duration
    - Indication*
  - Prescriber and team
- Ability to review and give AMS advice **daily!!**
  - target AMS ward rounds
  - Stock shortages management
Improvements in Antimicrobial Appropriateness of Prescribing

**Proportion of inappropriate prescribing according to teams**

- Oncology: 36%
- Respiratory: 13%
- General medicine: 12%
- Ophthalmology: 7%
- Gastroenterology: 4%
- Haematology: 4%
- BMT: 6%
- CF: 3%
- ENT: 3%
- Orthopedics: 3%
- Surgical: 3%
- Rehab: 2%
- Plastic: 1%
- N/A: 1%

**Compliance to AMS advice**

- Yes: 54%
- No: 37%
- No response: 8%
- N/A: 1%

2014-2016 based on hospital wide NAPS
Mar-Sept 2017 based on Virtual AMS ward rounds

National average 78%
Improvements in the duration of Antibiotic Surgical prophylaxis

Percentage antibiotic surgical prophylaxis >24 hours in duration (LOWER IS BETTER)

Pre-eMM

2014
44%

2015
56%

2016
71%

2017
19%

National average
27%

Surgeons with surgical antibiotic >24 hours in duration

Orthopaedics
60%

Plastics
12%

Neurosurgery
12%

Cardiac Surgery
1%

Cardiology
1%

Cardiothoracic
3%

Surgery
4%

Trauma
4%

N= 71 / 382

2014-2016 based on hospital wide NAPS
March- September 2017 based on virtual AMS ward rounds
Thank you for listening

- Acknowledgements:
  - Alison Kesson, Alex Outhred, Phil Britton, Shobini Sivagnananam, Sofia Badran, Julie Huynh and Laila Al Yazidi
  - Jillian Campbell and Daniel Trajkov
  - Fiona Doukas
  - David Andresen
  - Peter Barclay