Audit of Prescribing Patterns for Restricted Antibiotics in an Inpatient Setting (APPRAIRS): Appraisal Reveals Hospital Overuse and Underdosing of Carbapenems

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Background
Restriction of certain broad spectrum, high cost, or resistance promoting antimicrobials is a recognized method of antimicrobial stewardship

A province wide Restricted Antimicrobials policy exists but has been variably implemented and utilized. Prior to implementing restrictions, we evaluated the utilization of the restricted list

Objectives
• To inform site based administration, prescribers, pharmacists and other allied health workers on the current state of practice surrounding the following restricted antimicrobials, daptomycin, imipenem, meropenem, ertapenem, linezolid and tigecycline.
• To examine the usability of the current formulary guidelines
• Identify possible stewardship interventions to support best practices in use of these

Methods
• All adult inpatients at the UAH started on a restricted antibiotic from January 9th - February 6th, 2014 were prospectively enrolled and followed.
• Patient charts were reviewed to collect relevant patient, microbiological and clinical data. Indication for use and guideline concordance was determined by the researcher, Drug Stewardship Pharmacist and Physician.
• Data was de-identified, entered into a secure database, and analyzed using Excel pivot tables and descriptive statistics.

Results

Patient Demographics .

Table 1. Patient characteristics (N=85)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>47</td>
<td>38</td>
</tr>
<tr>
<td>Age (years)</td>
<td>55</td>
<td>18-90</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>81</td>
<td>42-200</td>
</tr>
<tr>
<td>CrCl (ml/min)</td>
<td>82</td>
<td>8-192</td>
</tr>
</tbody>
</table>

Provincial Guidelines for Use: Target Antimicrobials

Meropenem - As part of combination therapy of infections with Nocardia spp or nontuberculous Mycobacteria spp

Results

Figure 1. Breakdown of identified restricted antibiotic orders

Ordering Service
The attending service ordered 77% of restricted antibiotics; only 23% (n=21/92) of orders came from the Transplant Infectious Disease or Infectious Disease service.

Discussion and Conclusions

Restricted antimicrobial use was 72% guideline concordant, with opportunities identified for a proposed stewardship team to
• Educate on antibiotic guidelines and dosing
• Improve streamlining by culture review (and encourage appropriate microbiologic diagnostics)
• Focus intervention on wards with highest use and highest rate of guideline discordant use

The antibiotic guidelines were revised for improved clarity of application for both education and audit purposes.