The Problem
Methicillin-resistant *Staphylococcus aureus* (MRSA) is a common cause of nosocomial pneumonias. Its role in healthcare-associated pneumonia (HCAP) however, is less well-defined. A national shortage of vancomycin during the first quarter of 2015 prompted re-evaluation of our institutional utilization.

- For HCAP, the benefit of broad Gram-negative and MRSA coverage over narrower agents has recently been challenged.
- Nationally, MRSA is implicated as a pathogen in 2-25% of HCAP cases, with institutional MRSA rates at BIDMC falling from 2010 to 2015.
- Infectious Diseases Society of America guidelines recommend de-escalation of empiric antibiotic therapy with clinical improvement and microbiologic data.
- MRSA nasal swab cultures achieve greater than 95% negative predictive value for MRSA pneumonia and can be leveraged as a de-escalation tool.
- Efforts to curb overuse and misuse of antimicrobials are a mainstay of national stewardship goals to reduce resistance, adverse drug events and costs.

Aim/Goal
The purpose of this retrospective review was to describe vancomycin prescribing patterns in patients with HCAP between fiscal years 2014 and 2015 and to determine the utility and benefit of structured, early vancomycin de-escalation. Using documented antimicrobial stewardship interventions, this review also aimed to describe the frequency with which specific discussions of early vancomycin de-escalation occurred.

The Team
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The Interventions
The following represent criteria used by the antimicrobial stewardship team (AST) when considering early vancomycin de-escalation for patients with HCAP:

- Nasal swab negative for MRSA
- No pertinent history of multidrug-resistant, Gram-positive organisms
- Resolving or absent radiographic evidence of pneumonia
- Microbiologic data not consistent with resistant Gram-positive organisms
- Patient clinically improved at the time of AST intervention

The Results/Progress to Date

<table>
<thead>
<tr>
<th>Outcome</th>
<th>FY14 (n=25)</th>
<th>FY15 (n=25)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin Levels/Patient Days</td>
<td>0.13</td>
<td>0.15</td>
<td>0.639</td>
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<tr>
<td>Average Level (mcg/mL)</td>
<td>17.6</td>
<td>16.0</td>
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<td>Dose Adjustments/Patient</td>
<td>0.0</td>
<td>0.08</td>
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<tr>
<td>Length of Stay (Mean Days)</td>
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<td>11.0</td>
<td>0.157</td>
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<td>Discharge Status</td>
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<tr>
<td>Home</td>
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<td>9</td>
<td>0.254</td>
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<tr>
<td>Long Term Care</td>
<td>11</td>
<td>14</td>
<td>0.369</td>
</tr>
<tr>
<td>Expired</td>
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<td>2</td>
<td>0.651</td>
</tr>
<tr>
<td>AST Interventions Suggesting De-escalation</td>
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<td>14</td>
<td>0.0106</td>
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</table>

Lessons Learned
- Early vancomycin de-escalation in HCAP patients may be an effective way to limit broad-spectrum antibiotic use.
- Most patients treated for HCAP lacked appropriate sputum cultures.
- The short median duration of vancomycin (4 days) for HCAP over both fiscal years may reflect an institutional change in practice.

Next Steps/What Should Happen Next
- For mildly ill patients with HCAP lacking MRSA risk factors, narrower therapy (i.e., regimens appropriate for CAP) may be appropriate.
- When considering HCAP as a diagnosis, providers are encouraged to obtain high-quality sputum samples. For patients unable to produce quality sputum, a nasal MRSA swab may help target antibiotic therapy.
- A targeted course of antibiotics for HCAP with clinical improvement (i.e., 7 days versus 14 days for most non- *Pseudomonas* infections) is an additional goal.

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