VUMC Surgical Intensive Care Unit Antibiotic Stewardship Guideline

Purpose: To promote appropriate use of antimicrobials and decrease microbial resistance in the surgical intensive care unit (SICU).

Background: The multidisciplinary SICU team employs infection reduction and antibiotic stewardship practices. Such practices have resulted in a dramatic reduction in multidrug resistant pathogens, a significant increase in the percentage of pathogens that are pan-sensitive, and a significant reduction in broad spectrum antibiotic use per patient day.1,2,4,5

Antibiotic Stewardship Program Components:

1. Antibiotic Prophylaxis
   - All antibiotic prophylaxis will be discontinued ≤ 24 hours post operatively
   - Use narrowest spectrum antibiotics based on type of surgery

2. Quantitative Cultures
   - Quantitative bronchoalveolar lavage for diagnosis of hospital acquired pneumonia (HAP)
     o Quantitative culture ≥ 10,000 cfu/mL

3. Empiric Antibiotic Protocols
   - Indication specific empiric antibiotic therapy
   - Empiric antibiotics driven by unit data and hospital antibiogram
   - Evidence-based antibiotic treatment durations

4. Quarterly Antibiotic Rotation
   - Maintenance of antibiotic heterogeneity
   - Avoidance of an antibiotic class each quarter

5. Narrowing of Antimicrobial therapy
   - De-escalate therapy as soon as possible based on culture results

SICU Antibiotic Rotation Schedule:

<table>
<thead>
<tr>
<th>Excluded Class</th>
<th>1st Quarter</th>
<th>2nd Quarter</th>
<th>3rd Quarter</th>
<th>4th Quarter</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital-</td>
<td>BLIC</td>
<td>FQ</td>
<td>CARB</td>
<td>3/4 CEPH</td>
<td>7 – 14 days</td>
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<tr>
<td>Acquired</td>
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<tr>
<td>Pneumonia*</td>
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<td></td>
<td>Levofloxacin (+) Tobramycin (+) Vancomycin</td>
<td>Meropenem (+) Vancomycin</td>
<td>Cefepime (+) Vancomycin</td>
<td>Piperacillin/tazobactam (+) Vancomycin</td>
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<tr>
<td>Intraabdominal</td>
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<tr>
<td>Infection</td>
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<tr>
<td></td>
<td>Cefepime (+) Metronidazole (+) Vancomycin</td>
<td>Piperacillin/tazobactam</td>
<td>Levofloxacin (+) Metronidazole</td>
<td>Meropenem</td>
<td>4 – 7 days</td>
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<tr>
<td>Bacteremia</td>
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<tr>
<td></td>
<td>Cefepime (+) Metronidazole (+) Vancomycin</td>
<td>Piperacillin/tazobactam (+) Vancomycin</td>
<td>Levofloxacin (+) Metronidazole (+) Vancomycin</td>
<td>Meropenem (+) Vancomycin</td>
<td>7 – 14 days</td>
</tr>
</tbody>
</table>

BLIC = beta-lactam/beta-lactamase inhibitor combinations, FQ = fluoroquinolone, CARB = carbapenems, 3/4CEPH = 3rd and 4th generation cephalosporins

*Hospital-acquired pneumonia (HAP) is defined as a pneumonia not incubating at the time of hospital admission and occurring 48 hours or more after admission and includes ventilator-associated pneumonia.
Intraabdominal Infection Protocol Considerations:

- **Antifungal Coverage**
  - Consider addition of fluconazole for:
    - Upper gastrointestinal perforations
    - Recurrent bowel perforations
    - Surgically treated pancreatitis
    - Candida growth on cultures or known to be colonized with candida
    - Immunocompromised patients

- **MRSA coverage**
  - Consider addition of vancomycin for:
    - Prior MRSA infection
    - Recent hospitalization and/or nursing facility exposure
    - Intravenous antibiotic use within the past 90 days

Pneumonia Protocol Considerations:

- Consider double gram-negative coverage with tobramycin
  - Prior intravenous antibiotic use within the past 90 days
  - Prior multi-drug resistant infections
  - Septic shock
  - Failure to improve on current regimen

Exceptions to the Antibiotic Protocol

- Solid organ transplant recipients
  - Should not receive an aminoglycoside unless deemed appropriate by the primary transplant team
- Necrotizing skin and soft tissue infections
  - Should be given either piperacillin/tazobactam or meropenem for empiric gram negative coverage

References:


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