Extended Infusion Beta-lactam Protocols
Go-Live: December 22, 2015
Emily Mui, PharmD, BCPS
Lina Meng, PharmD, BCPS
Stanford Antimicrobial Safety and Sustainability (SASS) Program

Rationale

- Maximize the time-dependent bactericidal activity
  - Time which the free drug concentration exceeds the MIC of the organism (fT>MIC)
- Target pathogens with high MIC (e.g. pseudomonas)
- Improved mortality and lower length of stay

<table>
<thead>
<tr>
<th>Pathogens</th>
<th>Carbapenems</th>
<th>Cephalosporins</th>
<th>Penicillins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram-positive</td>
<td>20-30% fT&gt;MIC</td>
<td>40-50% fT&gt;MIC</td>
<td>30-40% fT&gt;MIC</td>
</tr>
<tr>
<td>Gram-negative</td>
<td>40-50% fT&gt;MIC</td>
<td>60-70% fT&gt;MIC</td>
<td>50-50% fT&gt;MIC</td>
</tr>
</tbody>
</table>


Process

- All orders will default to the extended-infusion regimen for Zosyn®, cefepime, and meropenem except:
  - One-time orders in the ER
  - OR/PACU/pre-op
  - Ambulatory care areas

- Please contact floor pharmacist to opt out
- Medication scheduling and/or drug compatibility conflicts that cannot be resolved without placing additional lines
- Patients who are on a prolonged course of antibiotics (e.g. osteomyelitis), are clinically improving, AND the organism has an MIC ≤ 4

Policy

- Upon provider request, SHC pharmacists will manage inpatient IV vancomycin therapy in accordance with evidence-based guidelines and best practice standards

- Pharmacist will:
  - Based on MD/APP specified indication, select goal trough level per protocol/IDSA guidelines
  - Enter necessary drug and lab orders
  - Vancomycin doses
  - Vancomycin troughs ($342 each)
  - SCr

- Exclusion Criteria:
  - One-time dose
  - Surgical/per-operative prophylaxis
  - Pediatric patients (<18 years of age)
Provider Responsibility

- Select “Vancomycin per Pharmacy Protocol” to indicate that pharmacist should manage therapy
  - Modeled after “Warfarin per Protocol”
  - Do NOT need to enter a vancomycin dose

- Specify:
  - Initial Indication: Prophylaxis, empiric, definitive
  - Suspected or definitive infection type: pneumonia, cellulitis, etc.
  - Anticipated duration of therapy (days)

- May discontinue or re-initiate protocol at any time
  - If discontinued, provider assumes responsibility for monitoring vancomycin therapy

Initial Dosing*

<table>
<thead>
<tr>
<th>CrCl (mL/min)</th>
<th>Optional Loading Dose**</th>
<th>Initial Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 90</td>
<td>25-50 mg/kg x1</td>
<td>15-30 mg/kg Q8-12H</td>
</tr>
<tr>
<td>51-90</td>
<td>25-50 mg/kg x1</td>
<td>15-30 mg/kg Q12H</td>
</tr>
<tr>
<td>30-50</td>
<td>20-30 mg/kg x1</td>
<td>10-15 mg/kg Q12-24H</td>
</tr>
<tr>
<td>10-29</td>
<td>20-30 mg/kg x1</td>
<td>10-15 mg/kg Q24-48H</td>
</tr>
<tr>
<td>&lt;10, AKI</td>
<td>15-25 mg/kg x1</td>
<td>10-15 mg/kg Q24-72H O/D dose by level</td>
</tr>
<tr>
<td>IND</td>
<td>15-20 mg/kg x1</td>
<td>5-10 mg/kg x1, then dose by level (See Section IV-E – Special Populations)</td>
</tr>
<tr>
<td>CRRT</td>
<td>15-25 mg/kg x1</td>
<td>10-15 mg/kg Q24H (See Section IV-E – Special Populations)</td>
</tr>
<tr>
<td>CAPD</td>
<td>1000 mg x1</td>
<td>500-1000 mg Q9-12H</td>
</tr>
</tbody>
</table>

* Dose using TBW; Maximum single dose = 2.5 gm
** Loading Dose is recommended to critically ill patients with serious infections (pneumonia, endocarditis, meningitis, deep seated infections, mediasitis, meningitis, sepsis, intra-abdominal infections, necrotizing fasciitis, febrile neutropenia (empiric therapy; suspected MRSA or severe infection))
***Dose by level, timing & administration: consult pharmacist/physician

Goal Trough Levels

- Pharmacist to select based on indication:
  - Cellulitis, skin/soft tissue infections not penetrating bone: 10 – 15
  - Pneumonia, bacteremia, endocarditis, cellulitis, deep seated infections, mediastinitis, meningitis, sepsis, intra-abdominal infections, necrotizing fasciitis, febrile neutropenia: 15 – 20

- What if you request a goal that does not match the protocol?
  - If it is close to/within the protocol goal range, pharmacist will document the rationale and proceed
  - If it is significantly different than protocol goal range, pharmacist will request that it not be managed per protocol

Documentation

- Pharmacist progress note will not be entered daily
  - Daily documentation will occur in pharmacist EPIC flowsheet

- Pharmacists will only enter notes in the following instances:
  - Initiation of protocol (new start)
  - New trough level results
  - Change in dose
  - Change in patient’s status that impacts vancomycin dosing

Questions?

- Protocol links
  - SHC Intranet → Policies → Pharmacy Policies Manual → Section 7: Medication Monitoring

- Contact:
  - ID Pharmacists: ABX@stanfordhealthcare.org
  - Janji Desai, Pharmacy Manager of Clinical Effectiveness: jdesai@stanfordhealthcare.org

- Website: