Piperacillin/Tazobactam (Zosyn) Desensitization Protocol

1. Initiation of Protocol Requirements:
   ☑ Admit patient to ICU: _________________________
   ☑ Patient MUST be full code for the desensitization procedure and thru the next full dose is administered. If patient is DNR/DNI, the primary team should discuss with the patient or legal guardian whether they are willing to reverse the status to FULL CODE for the duration of the procedure.
   ☐ Consult UM Allergist
   ☐ If patient is taking a beta blocker, HOLD beta blocker for 24 hours before protocol is administered.

2. Monitoring Requirements:
   ☑ Monitor and chart vital signs and oxygen saturation prior to the first dose and prior to each dose escalation (5min during dose and 10minutes after each dose = every 15 minutes).
   ☑ Assess breath sounds prior to first dose, prior to each dose escalation, and upon complaints of respiratory symptoms including dyspnea or chest tightness.
   ☑ Notify ICU fellow/attending or allergist at: ____________________ and hold subsequent doses until further orders if any of the following signs or symptoms occur:
     b. Skin: localized or generalized itching, flushing, hives, swelling (angioedema), morbilliform rash.
     c. GI: abdominal cramps or pain (colic), nausea, vomiting, diarrhea, loss of bowel control.
     d. Respiratory: nasal congestion or sneezing, rhinorrhea, tightness in the throat, hoarseness, “barky” cough, difficulty swallowing, dyspnea, chest tightness, wheezing, stridor, drop in oxygen saturation, cyanosis, respiratory distress.
     e. Cardiovascular: tachycardia (increase >15 beats/min), dysrhythmia, mild hypotension, bradycardia, profound hypotension, cardiac arrest.
   ☑ If allergic reaction occurs call physician at phone number listed above and administer the following agents in the listed sequence:
     a. Give 0.3mg (0.3mL) of 1:1000 epinephrine IM x1. May repeat Q5Min x2 as needed for allergic reaction.
     b. After epinephrine, Give 0.9% NaCl 1000mL IV bolus x 1 as needed for systemic reaction.
     c. After 0.9% NaCl, give Methylprednisolone 125mg IV x 1 dose PRN for systemic reaction.
     d. After Methylprednisolone, administer diphenhydramine 50mg IV X 1 PRN systemic reaction.
     e. After diphenhydramine, administer ranitidine 150mg IV x1 PRN systemic reaction.

3. Drug Desensitization Procedures:
   ☑ Start with bag labeled solution #1.
   ☑ Give each dose over 5 minutes. Then, allow a 10 minute monitoring period for signs/symptoms of allergic reaction before giving the next dose. If tolerating, modify infusion rate and volume to be infused (VTBI) on the pump in an escalating manner per protocol.
   ☑ Document each dose as “given” on the flowsheet on page 2 of this protocol.
   ☑ Monitor for 30 minutes after the final dose. If no reaction occurs, start the scheduled piperacillin/tazobactam dose as follows 8 to 12 hours from the last desensitization dose as ordered by the treating physician:
     Piperacillin/Tazobactam ________________   IV Q__________H
   ☑ If dose is held for more than 24 hours, notify allergist prior to re-administration of the drug.

4. Pharmacy Compounding Instructions:
   ☑ Pharmacist: Enter set named Piperacillin/Tazobactam Desensitization protocol
   ☑ Technician: Make doses as follows:
     a. Solution #3: Piperacillin/Tazobactam 3.375g in 100mL D5W. Remove equivalent volume being added to bag to keep concentration consistent. Label as solution #3.
     b. Solution #2: Remove 5mL from Solution #3 and add to a 50mL bag of D5W. Label as solution #2.
     c. Solution #1: Remove 2mL from Solution #2. Place in a 100mL bag of D5W to create a piperacillin/tazobactam (6.75mg/100mL) bag. Label as solution #1.

Physician Name and Signature:________________________________________ Date:_________________
Physician contact phone number: ___________________________________________
## Piperacillin/Tazobactam Desensitization Protocol

<table>
<thead>
<tr>
<th>Dose #</th>
<th>Protocol Time</th>
<th>Actual Time Given</th>
<th>Rate (mL/hr)</th>
<th>VTBI (mL)</th>
<th>Infusion time</th>
<th>Dose (mg)</th>
<th>Cumulative Dose (mg)</th>
<th>Next Dose Due at (time)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>0:00</td>
<td></td>
<td>9</td>
<td>0.8</td>
<td>5 min</td>
<td>0.05</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0:15</td>
<td></td>
<td>18</td>
<td>1.6</td>
<td>5 min</td>
<td>0.1</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0:30</td>
<td></td>
<td>36</td>
<td>3</td>
<td>5 min</td>
<td>0.21</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0:45</td>
<td></td>
<td>72</td>
<td>6</td>
<td>5 min</td>
<td>0.4</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1hr</td>
<td></td>
<td>144</td>
<td>12</td>
<td>5 min</td>
<td>0.8</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

Total bag infused: 23.4mL  
Total bag to waste: 76.6mL

**Change to Solution Bag #2 (162mg/48mL)**

<table>
<thead>
<tr>
<th>Dose #</th>
<th>Protocol Time</th>
<th>Actual Time Given</th>
<th>Rate (mL/hr)</th>
<th>VTBI (mL)</th>
<th>Infusion time</th>
<th>Dose (mg)</th>
<th>Cumulative Dose (mg)</th>
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</thead>
<tbody>
<tr>
<td>6</td>
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<td>6</td>
<td>0.5</td>
<td>5 min</td>
<td>1.6</td>
<td>3.5</td>
</tr>
<tr>
<td>7</td>
<td>1:30</td>
<td></td>
<td>12</td>
<td>1</td>
<td>5 min</td>
<td>3.3</td>
<td>6.5</td>
</tr>
<tr>
<td>8</td>
<td>1:45</td>
<td></td>
<td>24</td>
<td>2</td>
<td>5 min</td>
<td>6.6</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>2:00</td>
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<td>48</td>
<td>4</td>
<td>5 min</td>
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<td>8</td>
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<td>26.4</td>
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<tr>
<td>11</td>
<td>2:30</td>
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<td>192</td>
<td>16</td>
<td>5 min</td>
<td>52.7</td>
<td>105</td>
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</table>

Total bag infused: 31.5mL  
Total bag to waste: 16.5mL

**Change to Solution Bag #3 (3206/95mL)**

<table>
<thead>
<tr>
<th>Dose #</th>
<th>Protocol Time</th>
<th>Actual Time Given</th>
<th>Rate (mL/hr)</th>
<th>VTBI (mL)</th>
<th>Infusion time</th>
<th>Dose (mg)</th>
<th>Cumulative Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>2:45</td>
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<td>38</td>
<td>3</td>
<td>5 min</td>
<td>105.5</td>
<td>211</td>
</tr>
<tr>
<td>13</td>
<td>3:00</td>
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<td>75</td>
<td>6</td>
<td>5 min</td>
<td>210.9</td>
<td>422</td>
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<tr>
<td>14</td>
<td>3:15</td>
<td></td>
<td>156</td>
<td>12</td>
<td>5 min</td>
<td>241.9</td>
<td>844</td>
</tr>
<tr>
<td>15</td>
<td>3:30</td>
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<td>300</td>
<td>25</td>
<td>5 min</td>
<td>843.8</td>
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<td>3:45</td>
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<td>600</td>
<td>50</td>
<td>10 min</td>
<td>1687.5</td>
<td>3375</td>
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</tbody>
</table>

Total bag infused: 100mL  
Total bag to waste: 0mL

**Total Time to Desensitize: 4 hours**  
**Total Cumulative Dose: 3375mg**

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**References:**