Heparin Infusion Guidelines

Dosing: Discontinue all other orders for heparin products (i.e. heparin subcutaneous, enoxaparin)

Venous Thromboembolic Disorder: DVT, PE
- Initial bolus: 80 units/kg (max of 10,000 units)
- Initial infusion: 18 units/kg/hr (initial max of 18 ml/hr (1,800 units/hr)

Cardiac: Unstable angina, ST elevation MI, non-ST elevation MI
- Initial bolus: 60 units/kg (max of 5,000 units)
  (max of 4,000 units for ST elevation MI with thrombolytics
- Initial infusion: 12 units/kg/hr (initial max of 10 ml/hr (1,000 units/hr)

Neuro: Ischemia/strokes with a suspected embolic source in which thrombolytics have not been given and a CT has confirmed no cerebral hemorrhage
- Initial bolus: None
- Initial infusion: 12 units/kg/hr (initial max of 12 ml/hr (1,200 units/hr)

- The standard concentration for heparin is 25,000 units/250 ml D5W
- Heparin doses should be rounded to the nearest 100 units/hr increment

Monitoring:

- Baseline labs
  - PT/INR
  - aPTT
  - CBC

- Monitoring while on heparin
  - Anti-Xa level 6 hours after starting the infusion and 6 hours after each change in the infusion rate;
  May decrease to daily anti-Xa once two consecutive anti-Xa levels are within the therapeutic range.
  - Call physician if 2 consecutive anti-Xa levels greater than 0.9 or less than 0.2
  - Daily CBC
    - If platelet count decreases by 50% of baseline or falls below 100,000 notify physician for possible HIT.
    - If Hemoglobin decreases by 2 g/d, notify physician.
    - If signs of bleeding occur, notify physician.

- For patients receiving large doses of heparin such as cardiac procedures, an ACT may be used to monitor heparin therapy.

Dose Adjustments:

<table>
<thead>
<tr>
<th>Anti-Xa (units/mL)</th>
<th>Re-bolus</th>
<th>Hold Infusion</th>
<th>Rate Adjustment</th>
<th>Next Anti-Xa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.2</td>
<td>80 units/kg</td>
<td>0 mins</td>
<td>Increase 4 units/kg/hr</td>
<td>6 hours</td>
</tr>
<tr>
<td>0.2-0.29</td>
<td>40 units/kg</td>
<td>0 mins</td>
<td>Increase 2 units/kg/hr</td>
<td>6 hours</td>
</tr>
<tr>
<td>0.3-0.7</td>
<td>No bolus</td>
<td>0 mins</td>
<td>No Change</td>
<td>6 hours*</td>
</tr>
<tr>
<td>0.71-0.8</td>
<td>No bolus</td>
<td>0 mins</td>
<td>Decrease 1 units/kg/hr</td>
<td>6 hours</td>
</tr>
<tr>
<td>0.81-0.9</td>
<td>No bolus</td>
<td>30 mins</td>
<td>Decrease 2 units/kg/hr</td>
<td>6 hours</td>
</tr>
<tr>
<td>Greater than 0.9</td>
<td>No bolus</td>
<td>60 mins</td>
<td>Decrease 3 units/kg/hr</td>
<td>6 hours</td>
</tr>
</tbody>
</table>

* Once two consecutive anti-Xa levels are within range, may collect daily with AM labs
Reversal Recommendations:

- **Protamine sulfate**
  - Reserve for patients with clinically significant bleeding episodes
  - Dosing: (time elapsed since heparin administration)
    - **Immediate:**
      - Administer 1 mg of protamine for every 100 USP units of heparin. Dose may be repeated in 10 to 15 minutes
      - Do not exceed 50 mg in any 10 to 15 minute period, or 100 mg in 2 hours
    - **30-60 minutes:**
      - Administer 0.5 to 0.75 mg for every 100 USP units of heparin
    - **Less than 2 hours:**
      - Administer 0.25 to 0.375 mg for every 100 USP units of heparin

**Bridge Therapy:**

- Overlap warfarin with heparin for at least 5 days and until the INR is within the therapeutic range for 2 consecutive days.

Source: February 2012; 141(2_suppl) Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

Version: 2 Reviewed: 12.17.14