University Health System
Anticoagulation Safety Committee

Unfractionated Heparin Infusion Protocol

Objective: To standardize heparin anticoagulation therapy at University Hospital. It has been recognized in the literature that patients in whom heparin infusion therapy is dosed according to weight-based nomograms achieve earlier therapeutic range, shorter length of stay, and fewer thromboembolic recurrences than patients who received “fixed-dose” therapy. This protocol was updated in June 2009 to include dosage adjustments based on the results of a heparin assay test.

Population: Adult patients requiring IV unfractionated heparin anticoagulation therapy. (For use when anticoagulation therapy with Low Molecular Weight Heparins or Fondaparinux is not indicated)

Dosing and Monitoring Guidelines

I. Baseline Labs (within 24 hrs prior to initiation of therapy)
   a. CBC (Hgb, Hct, platelet count)

II. Dosing
   a. Determine initial bolus dose and infusion rate
      i. Initial Bolus dose is indication specific, see tables below
      ii. Initial max infusion rate is indication specific, see tables below
   b. Total body weight (TBW as dry weight) will be used to calculate doses
   c. Be sure to not exceed max doses in obese patients

III. Routine Labs and Monitoring
   a. Heparin assay 6 hours after initiating heparin
   b. Heparin assay 6 hours after each dosage change, until 2 consecutive therapeutic levels are reached at a constant rate of infusion, then can begin monitoring once daily
   c. Target therapeutic heparin level by Anti Xa assay is 0.3-0.7 U/mL
   d. Order CBC at least every other day and more frequently if deemed medically necessary
   e. Monitor for signs of HIT (Platelet drop by > 50% OR decrease < 150 K/µL)
      i. Treatment of HIT
         a. Stop all sources of heparin
         b. Refer to Guidelines for the use of Argatroban and Lepirudin posted on the clinical intranet.
### Venous Thromboembolism Treatment* (Target AntiXa 0.3 - 0.7 U/mL)$^{1,2}$

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<td>&lt; 0.15</td>
<td>80 unit/kg bolus, then increase by 4 units/kg/hr</td>
</tr>
<tr>
<td>0.15 – 0.29</td>
<td>40 unit/kg bolus, then increase by 2 units/kg/hr</td>
</tr>
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<td><strong>0.3 - 0.7</strong></td>
<td><strong>No Change</strong></td>
</tr>
<tr>
<td>0.71 - 1</td>
<td>Decrease by 2 units/kg/hr</td>
</tr>
<tr>
<td>&gt; 1</td>
<td>Stop infusion 1 hr then decrease by 3 units/kg/hr</td>
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Monitor: Heparin Assay at least 6 hours after initiation and 6 hours after each dosage change

Indications - DVT, PE, Atrial fibrillation

### Acute Coronary Syndrome Cardiology (Target AntiXa 0.3 - 0.7 U/mL)$^{2-4}$

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Indications - Non-STEMI, Unstable Angina, STEMI

### IV. Warfarin Bridging

- a. Overlap heparin and warfarin for at least 4-5 days and until 2 therapeutic INRs are achieved 24 hours apart
- b. If patient will be discharged prior to 4 days, use LMWH to bridge
- c. **IV heparin to SQ LMWH conversion** - give first LMWH injection, then discontinue heparin immediately after

### V. Treatment of IV Heparin Overdose

- a. Protamine sulfate injection – 1 mg of protamine sulfate neutralizes 100 heparin units
- b. Only the heparin dose given over the last 3-4 hours needs to be included in the protamine dose calculation. (Based on heparin half-life 45-60 min)
- c. Give dose by slow IV push, never to exceed 50 mg over a 10-minute period

### References

2. Hirsh J, Bauer KA, Donati MB et al. Chest 2008;133(suppl)141S-155S.