



Adult 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 on page 2
 - ii. Initial max infusion rate is **indication specific**, see tables on page 2
 - b. Total body weight (TBW as dry weight) will be used to calculate doses¹
 - 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 unit/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/ μ L)
 - i. **Treatment of HIT**
 - a. Stop **all** sources of heparin
 - b. Refer to **Guidelines for the use of Argatroban** are posted on the Clinical Pathways and Guidelines page.

Venous Thromboembolism Treatment* (Target AntiXa 0.3 - 0.7 unit/mL)^{1,2}

Initial Bolus: 80 units/kg (Max Bolus 10,000 units)	
Initial Infusion Rate: 18 unit/kg/hr (Max initial rate 2,000 units/hr)	
Monitor: Heparin Assay at least 6 hours after initiation and 6 hours after each dosage change	
Heparin Assay AntiXa (unit/mL)	Action
< 0.15	80 unit/kg bolus, then increase by 4 units/kg/hr
0.15 – 0.29	40 unit/kg bolus, then increase by 2 units/kg/hr
0.3 - 0.7	No Change
0.71 - 1	Decrease by 2 units/kg/hr
> 1	Stop infusion 1 hr then decrease by 3 units/kg/hr

Indications - DVT, PE, Atrial fibrillation

Heparin assay of 0.3-0.7 currently corresponds to an aPTT range of 70-120 seconds. Therapeutic aPTT range may change based on the aPTT reagent used in lab. Heparin assay therapeutic range will not change.

Acute Coronary Syndrome Cardiology (Target AntiXa 0.3 - 0.7 unit/mL)²⁻⁴

Initial Bolus: 60 units/kg (Max Bolus 4,000 units)	
Initial Infusion Rate: 12 units/kg/hr (Max initial rate 1,000 units/hr)	
Monitor: Heparin Assay at least 6 hours after initiation and 6 hours after each dosage change	
Heparin Assay AntiXa (unit/mL)	Action
< 0.15	80 unit/kg bolus, then increase by 4 units/kg/hr
0.15 - 0.29	40 unit/kg bolus, then increase by 2 units/kg/hr
0.3 - 0.7	No Change
0.71 – 1	Decrease by 2 units/kg/hr
> 1	Stop infusion 1 hr then decrease by 3 units/kg/hr

Indications - Non-STEMI, Unstable Angina, STEMI

IV. Warfarin Bridging

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

V. Treatment of IV Heparin Overdose

- Protamine sulfate injection – 1 mg of protamine sulfate neutralizes 100 heparin units
- 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)
- Give dose by slow IV push, never to exceed 50 mg over a 10-minute period

References

- Spruill WJ, Wade WE, Huckaby WG, et al. Achievement of anticoagulation by using a weight-based heparin dosing protocol for obese and nonobese patients. Am J Health Syst Pharm 2001;58:2143-2146.
- Hirsh J, Bauer KA, Donati MB et al. Chest 2008;133(suppl)141S-155S.
- O'Gara PT, Kushner FG, Ascheim DD, et al. JACC 2013;61(4):486-508.
- Amsterdam EZ, Wenger NK, Brindis RG, et al. JACC 2014;64(24):e142-e228.

Developed by: Anticoagulation Safety Committee, 8/2008

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