



Weight-Based IV Unfractionated Heparin **Dosing in Adult**

Prepared by :

- ✓ **Eshraq Al-abweeny: Supervisor of DIC/KAUH**
- ✓ **Isra'a Al-bawaneh : Clinical Pharmacist in**
CCU/CICU

EXT: 41417

Treatment of Venous Thromboembolism^{a,b}

Initial dose and monitoring	80 units/kg bolus (maximum dose: 10,000 units) ^c , then 18 units/kg/hour (maximum initial infusion: 2,000 units/hour) ^c	Obtain aPTT ^{d,e} 6 hours after initial heparin bolus
-----------------------------	---	--

Dosing adjustments and monitoring	
aPTT (seconds)	Response
<40	<ul style="list-style-type: none"> • Bolus 25 units/kg • Increase infusion by 3 units/kg/hour • Repeat assay in 6 hours
40 to 49	<ul style="list-style-type: none"> • Increase infusion by 2 units/kg/hour • Repeat assay in 6 hours
50 to 69	<ul style="list-style-type: none"> • Increase infusion by 1 unit/kg/hour • Repeat assay in 6 hours
70 to 110 ^e	<ul style="list-style-type: none"> • No change (within therapeutic range) • Repeat assay in 6 hours • Once therapeutic for 2 consecutive assays, may change to once-daily assays
111 to 120	<ul style="list-style-type: none"> • Decrease infusion by 1 unit/kg/hour • Repeat assay in 6 hours
121 to 130	<ul style="list-style-type: none"> • Stop infusion for 1 hour, then decrease by 2 units/kg/hour • Repeat assay 6 hours after restarting the infusion
131 to 140	<ul style="list-style-type: none"> • Stop infusion for 1 hour, then decrease by 3 units/kg/hour • Repeat assay 6 hours after restarting the infusion
141 to 150	<ul style="list-style-type: none"> • Stop infusion for 2 hours, then decrease by 4 units/kg/hour • Repeat assay 6 hours after restarting the infusion
>150	<ul style="list-style-type: none"> • Stop infusion for 2 hours, then decrease by 5 units/kg/hour and notify clinician • Repeat assay 6 hours after restarting the infusion

^aHull 2019a

^bThis is one example of a weight-based heparin dosing nomogram. Each institution should establish their own heparin dosing nomogram. Other heparin nomograms based on aPTT or anti-Factor Xa monitoring may be employed. Therapeutic range for aPTT must be established at each individual laboratory (Dager 2018).

^cUse total body weight for calculations.

^daPTT: activated partial thromboplastin time

^eThe therapeutic ranges for the aPTT are dependent on local reagents and instrumentation and must be established by each individual institution.

Note:

Optimal dosing of UFH in obese patients is unknown. Most physicians use ideal body weight to guide dosing and increase the aPTT accordingly to the target. The clinical efficacy of this approach is unknown.

Atrial fibrillation (to prevent stroke and systemic embolism)

IV: Initial bolus of 60 to 80 units/kg (maximum: 5,000 units), followed by a continuous infusion of 12 to 18 units/**kg**/hour (maximum: 1,000 units/hour). Institutional dosing protocols may vary; adjust infusion rate to maintain anticoagulation target (aPTT 1.5 to 2.0 times control)*.

Acute coronary syndromes

☒ ST-elevation myocardial infarction :

- ✓ Adjunct to fibrinolysis: IV: Bolus 60 units/kg (maximum: 4,000 units), followed by 12 units/kg/hour (maximum: 1,000 units/hour); adjust infusion rate to maintain anticoagulation target based on institutional protocol; continue for ≥ 48 hours or until revascularization (if performed).
- ✓ No planned reperfusion: IV: Bolus 50 to 70 units/kg (maximum: 5,000 units), followed by 12 units/kg/hour; adjust infusion rate to maintain anticoagulation target based on institutional protocol; continue for ≥ 48 hours.

☒ Non-ST-elevation acute coronary syndromes :

Ischemia-guided (conservative) approach (alternative agent): IV: Bolus 60 units/kg (maximum: 5,000 units), followed by 12 units/kg/hour (maximum: 1,000 units/hour); adjust infusion rate to maintain anticoagulation target based on institutional protocol; continue for ≥ 48 hours or until management changes to an invasive strategy.

Mechanical heart valve, postsurgical management ,bridging anticoagulation with warfarin

Note: Bridging during intervals of subtherapeutic anticoagulation should be considered for patients with mechanical mitral or tricuspid valve replacement; however, for patients with mechanical aortic valve replacement, bridging is not required unless an additional thromboembolic risk factor is present or patient has an older-generation mechanical aortic valve.

IV: Initial: 12 to 18 units/kg/hour (no bolus) starting when INR falls below the therapeutic range; adjust infusion rate to maintain anticoagulation target based on institutional protocol. If patient is to undergo an invasive procedure, discontinue heparin 4 to 6 hours prior to procedure; reinitiate heparin infusion as soon as possible after the procedure when bleeding risk is acceptable. Continue heparin until warfarin has been reinitiated and INR is within therapeutic range for 2 consecutive days.

Acute peripheral arterial occlusion

Note: Specific dosing information is limited, but anticoagulation is commonly used at the time of diagnosis to limit thrombus propagation while the patient is evaluated for other possible interventions.

IV: Initial bolus of 60 to 80 units/kg, followed by an initial continuous infusion of 12 to 18 units/kg/hour; adjust infusion rate to maintain anticoagulation target based on institutional protocol.

References:

* Robert Phang, Warren J Manning,(2019). Prevention of embolization prior to and after restoration of sinus rhythm in atrial fibrillation.Gordon M Saperia(Ed.) *Uptodate*. Retrieved July 29,2020, from <https://www.uptodate.com/contents/prevention-of-embolization-prior-to-and-after-restoration-of-sinus-rhythm-in-atrial-fibrillation>

Russell D Hull, David A Garcia, Allison E Burnett.(2019). Heparin and LMW heparin: Dosing and adverse effects. Jennifer S Tirnauer(Ed.) *Uptodate*. Retrieved July 29,2020, from <https://www.uptodate.com/contents/heparin-and-lmw-heparin-dosing-and-adverse-effects>

Heparin. In: Lexi-drugs online [database on the Internet]. Hudson (OH): Lexicomp, Inc.; [updated 24 July 2020; cited 29 July 2020]. Available from: <http://online.lexi.com>.