Anticoagulation Dosing at UCDMC

Indication	Agent	Standard Dose	Comments and Dose Adjustments
VTE Prophylaxis			
All Services	UFH	▪ 5,000 units SC q 8 h ▪ See EMR adult VTE prophylaxis CI order set	▪ Assess bleeding risk factors ▪ Age greater than 85 years old and body weight less than 50 kg: may use UFH 5,000 units SC q 12 h ▪ Preferred agent in CrCl less than 20 ml/min including ESRD receiving renal replacement ▪ Obesity: consider doses greater than 5000 units ▪ See service specific considerations
	Enoxaparin	See service specific dosing	▪ CrCl less than 30 ml/min: reduce dose to 30 mg SC daily ▪ Hemodialysis: avoid, use UFH instead ▪ Obesity: if weight greater than 100kg in surgical patients, a dose of 40mg SC twice daily can be considered; however, it is unclear if the higher dose is warranted in the obese medical patient
Trauma	UFH	5000 units SC q 8 h	
	Enoxaparin	30 mg SC q 12 h or 40mg once daily	30mg q 12 h for NWB injuries, 40 mg q 24 h if not a NWB injury of LE/spine
Ortho-Trauma	UFH	5000 units SC q 8 h	
	Enoxaparin	30 mg SC q 12 h	40 mg q 24 h if not a NWB injury of LE/spine
	Fondaparinux	2.5 mg SC daily	▪ Anticoagulation, CPCS or hematology service approval required ▪ CrCl less than 30 ml/min: avoid use
	Warfarin	INR Target: 2-3	
Orthopedic Joint	UFH	5000 units SC q 8 h	
	Enoxaparin	▪ 30 mg SC q 12 h ▪ 40 mg SC daily	Use 40 mg once daily if given pre-operative as well, or if it has been over 1 week after surgery . If no preoperative LMWH given, dose is initially 30mg SC q 12 hours
	Rivaroxaban	10 mg PO g day	▪ Not required to give dose with evening meal ▪ First dose should be given 6-10 hrs after surgery ▪ CrCl is less than 30 ml/min: avoid use
	Apixaban	2.5 mg PO q 12 h	First dose should be given 12-24 hrs after surgery
	Warfarin	▪ INR: 1.5-2.5 ▪ INR: 1.5-2	Physician directed target
Orthopedic Spine	UFH	5000 units SC q 8 h	
	Enoxaparin	30 mg SC q 12 h	
GI Surgery	UFH	5,000 units SC q 8 h	
	Enoxaparin	40 mg SC q 24 h	Bariatric Surgery: enoxaparin 40 mg SC pre-op and post-op, then 40 mg SC q 12 h for duration of stay (if the patient is re-admitted within 30 days of surgery, but more than 7 days after the operation, use the currently approved LMWH)
Surgical Oncology	UFH	5,000 units SC q 8 h	
	Enoxaparin	40 mg SC q 24 h	
Burn Surgery	UFH	5,000 units SC q 8 h	
	Enoxaparin	30 mg SC q 12 h	
Vascular Surgery	UFH	5,000 units SC q 8 h	

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	Enoxaparin	40 mg SC q 24 h	
CT Surgery	UFH	5,000 units SC q 8-12 h	5,000 units SC q 12 h may be used post- OP day 1
	Enoxaparin	▪ 30 mg SC q 12 h ▪ 40 mg SC q 24 h	May prefer 40 mg SC q 24 h on post-OP day 1
GYN/GYN Oncology	UFH	5000 units SC q 8 h	
	Enoxaparin	40 mg SC q 24 h	
OB	UFH	5,000 units SC q 8 h	May be considered at time of delivery
	Enoxaparin	▪ 30 mg SC q 12 h ▪ 40 mg SC q 24 h	▪ Post-delivery prophylaxis may continue for up to 6 to 8 weeks ▪ Call Pharmacy or Anticoagulation Service for dosing assistance
Rehab Medicine	UFH	5,000 units SC q 8 h	
	Enoxaparin	40 mg SC daily	30 mg q 12 h if NWB injury of lower extremity or injury of spine
Medicine	UFH	5,000 units SC q 8 h	
	Enoxaparin	40 mg SC daily	
HIT history	Bivalirudin	Call Anticoagulation Service for assistance	▪ See bivalirudin guidelines for renal adjustment ▪ Anticoagulation, CPCS or hematology service approval required
	Fondaparinux	2.5 mg SC q 24 h	▪ Anticoagulation, CPCS or hematology service approval required ▪ CrCl less than 30 ml/min: avoid use
VTE Treatment			
All Services	UFH Cl	See EMR VTE treatment order set	
	Enoxaparin	1 mg/kg SC q 12 h	▪ In high risk patients (e. g. obesity, cancer, high clot burden), 1 mg/kg q 12 h is preferred; lower risk patients unable to tolerate q 12 h dosing, 1.5mg/kg SC daily can be considered if CrCl greater than 30 ml/min ▪ CrCl 30-60 ml/min: can reduce dose ~25%, or round down to next syringe size ▪ CrCl 20-30 ml/min: reduce dose to 1 mg/kg SC daily ▪ CrCl less than 20 ml/min or on HD: 0.7 mg/kg SC daily (range 0.4-1 mg/kg SC daily) ▪ Obesity: use actual body weight; dose capping not recommended
	Dabigatran	150 mg PO bid	▪ Parenteral therapy should be provided for at least 5 days prior to initiating dabigatran for acute VTE treatment ▪ CrCl less than 50 ml/min and receiving a P-gp inhibitor: avoid use ▪ CrCl less than 30 ml/min: no dosing recommendations; avoid use
	Rivaroxaban	15 mg PO bid for 21 days, then 20 mg PO daily	▪ Dose must be given with food ▪ CrCl less than 30 ml/min: avoid use
	Apixaban	10 mg PO bid for 7 days, then 5 mg PO bid	▪ If treatment is continued after 6 months of therapy, can reduce dose to 2.5 mg PO bid ▪ CrCl less than 25 ml/min or SCr ≥ 2.5 mg/dl: no dosing

			recommendations
	Edoxaban	60 mg PO daily	▪ Parenteral therapy should be provided for at least 5 days prior to initiating edoxaban for acute VTE treatment ▪ CrCl 15-50 ml/min, weight ≤ 60 kg, or use of P-gp inhibitor: 30 mg PO daily ▪ CrCl less than 15 ml/min: avoid use
Pediatrics	UFH CI	See EMR order sets	
	Enoxaparin	1 mg/kg SC q 12 h	▪ Adjust to anti-Factor Xa activity ▪ Age less than 2 months: 1.5 mg/kg SC q 12 h ▪ Call 6th floor pharmacy or Anticoagulation Service for dosing assistance
OB	UFH CI	See EMR order set	Started just prior to delivery
	Enoxaparin	1 mg/kg SC q 12 h	▪ Adjusted to anti-Factor Xa activity ▪ Call Pharmacy or Anticoagulation Service for dosing assistance
HIT	Bivalirudin	Call Anticoagulation Service for assistance	▪ See bivalirudin guidelines for renal adjustment ▪ Anticoagulation, CPCS or hematology service approval required
	Fondaparinux	Call Anticoagulation Service for assistance	▪ Anticoagulation, CPCS or hematology approval required ▪ CrCl less than 30 ml/min: avoid use
Cardiac Indications			
Atrial Fibrillation ($CHADS_2$ or CHA_2DS_2-VASc greater than or equal to 2, or history of embolic stroke or TIA; also see bridging guidelines)	Warfarin	INR 2-3	See comments below when considering bridge with UFH/LMWH
	UFH CI	See EMR ACS order set	▪ Typically no bolus is necessary ▪ Presence of a closure device or concern for thrombus on ECHO despite a $CHADS_2$ of 2 or less may still warrant parenteral anticoagulation
	Enoxaparin	1 mg/kg SC q 12 h	▪ Presence of a closure device or concern for thrombus on ECHO despite a $CHADS_2$ of 2 or less may still warrant parenteral anticoagulation ▪ CrCl 30-60 ml/min: can reduce dose ~25%, or round down to next syringe size ▪ CrCl 20-30 ml/min: reduce dose to 1 mg/kg daily ▪ CrCl less than 20 ml/min or on HD: 0.7 mg/kg SC daily (range 0.4-1 mg/kg SC once daily)
	Dabigatran	150 mg PO bid	▪ For nonvalvular atrial fibrillation only ▪ Do not open capsule; cannot be administered via NG tube ▪ CrCl 30-50 ml/min and receiving a P-gp inhibitor: consider 75 mg PO bid ▪ CrCl less than 30 ml/min: avoid use
	Rivaroxaban	20 mg PO daily	▪ For nonvalvular atrial fibrillation only ▪ Dose must be given with evening meal ▪ CrCl 15-50 ml/min: 15 mg PO daily ▪ CrCl less than 15 or on HD: avoid use
	Apixaban	5 mg PO bid	▪ For nonvalvular atrial fibrillation only ▪ If patient meets two of the following criteria - age ≥ 80 years, body weight ≤ 60 kg, SCr ≥ 1.5 mg/dL: 2.5 mg PO bid

			▪ ESRD on HD: 5 mg PO bid, or reduce to 2.5 mg PO bid if age ≥ 80 years or body weight ≤ 60 kg (based on single dose pharmacokinetic study only)
	Edoxaban	60 mg PO daily	▪ For nonvalvular atrial fibrillation only ▪ CrCl greater than 95 ml/min: avoid use; increased risk of stroke when compared to warfarin ▪ CrCl 15-50 ml/min: 30 mg PO daily ▪ CrCl less than 15 ml/min: avoid use
Mechanical Valve Replacement	Warfarin	▪ AVR – INR: 2-3 ▪ MVR – INR: 2.5-3.5	▪ Avoid DOACs and fondaparinux ▪ UFH/LMWH are options, but no clear recommendations for dosing; consider therapeutic dosing for MVR ▪ Physician guided goals for bioprosthetic valves
Ablation	Warfarin	INR 2-3	Procedure may be performed with INR in target range
	UFH	5,000 units SC q 8 h	
	Enoxaparin	0.5-1 mg/kg SC q 12 h	Call Anticoagulation Service for assistance if CrCl less than 30 ml/min
Acute Coronary Syndrome	Enoxaparin	30 mg or up to 0.5 mg/kg IV bolus at presentation	▪ See below for subsequent NSTEMI and STEMI dosing; initial SC dose administered at the time of IV bolus ▪ Age greater than 75 years: no bolus dose
NSTEMI	UFH Cl or intermittent bolus	See ACS order set	UFH bolus adjusted to ACT in cardiac cath lab
	Enoxaparin	1 mg/kg SC q 12 h	▪ CrCl less than 30 ml/min: 1 mg/kg SC q 24 hr ▪ Obesity: dose capping not recommended
STEMI	UFH Cl or intermittent bolus	See ACS order set	UFH bolus adjusted to ACT in cardiac cath lab
	Enoxaparin	1 mg/kg SC q 12 h	▪ Use actual body weight, but maximum 100 mg for the first two doses ▪ Age greater than 75: 0.75 mg/kg SC q 12 hr (maximum dose of 75 mg for the first two doses) ▪ CrCl less than 30 ml/min: 1 mg/kg SC q 24 hr

Abbreviations: SC = subcutaneously; CI = continuous infusion; CrCl = creatinine clearance; LMWH = low molecular weight heparin; UFH = unfractionated heparin; DOAC = direct oral anticoagulant; HD = hemodialysis; ESRD = end stage renal disease

Dalteparin Dosing:

Dalteparin may be used for patients here for a limited stay when using prior to admission for VTE treatment (e.g. cancer patients), or those who may be discharged and need 24 hour coverage while transitioning to a different anticoagulant. Give 200 units/kg/day SC if VTE event > 30 days. After 30 days, decrease to 150 units/kg/day. No adjustment if CrCl > 20 ml/min.

For VTE event < 1 month prior (200 units/kg):
<57Kg: 10,000 units
57-68kg: 12,500 units
69-82kg: 15,000 units
83-98kg: 18,000 units
99-106kg: 20,000 units
107-119kg: 22,500 units
120-131kg: 25,000 units
132-143kg: 27,500 units

For VTE related event > 1 month or other indications for treatment (≥ 150 units/kg):
<57Kg: 7,500 units
57-68kg: 10,000 units
69-82kg: 12,500 units
83-98kg: 15,000 units
99-120kg: 18,000 units
121-133kg: 20,000 units
134-150kg: 22,500 units

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144-150kg: 30,000 units >150kg: Call CLOT or pharmacy for dosing assistance

>150kg: Call CLOT or pharmacy for dosing assistance

LMWH Dose Rounding:

For patients weighing less than 50kg, call primary service to adjust to nearest syringe size. For enoxaparin, round up or down to nearest syringe based on assessment of thrombosis vs bleeding risk if > 50 kg. Consider rounding down if renal impairment, higher bleeding risk, elderly, frail etc. Consider rounding up if normal renal function, higher clotting risk, young, few comorbidities etc. For obese patients, call Anticoagulation service for dosing assistance.

Renal Impairment:

Use Cockcroft and Gault equation and total body weight for calculations. CrCl < 20 ml/min for either enoxaparin, dalteparin or fondaparinux: Call the Anticoagulation service for assistance.

Approved by P&T Committee 11/2015