THERAPY FOR THROMBOEMBOLIC DISORDERS* Part 1 of 3

Brand	Generic	Indication(s)	Usual Adult Dosing
ANTICOAGULANTS			
ANTICOAGULANT PROTEINS			
Ceprotin	protein C concentrate [human]	Prophylaxis and treatment of venous thrombosis and purpura fulminans in severe congenital protein C deficiency	Individualize. ≥10kg: max infusion rate 2mL/min. *Acute episodes/short term prophylaxis:* initially 100–120 Units/kg, then 60–80 Units/kg every 6hrs for 3 doses (titrate to maintain target peak protein C activity of 100%); maintenance: 45–60 Units/kg every 6 or 12hrs (After resolution of acute episode, continue patient on same dose to maintain trough protein C level above 25% for duration of therapy); continue until desired anticoagulation achieved. *Long-term prophylaxis:* 45–60 Units/kg every 12hrs (maintain trough protein C level above 25%).
ANTITHROMBINS			
ATryn	antithrombin [recombinant]	Prevention of peri-operative and peri-partum thromboembolic events in hereditary antithrombin deficient patients	Individualize. Administer loading dose as 15min IV infusion, followed by continuous IV infusion of maintenance dose. Monitor antithrombin activity once or twice daily and adjust to maintain antithrombin activity between 80%–120%. *See literature.*
Thrombate III	antithrombin III [human]	Treatment of hereditary antithrombin III deficiency (AT-III) in surgical or obstetrical procedures or patients who suffer from thromboembolism	Individualize. Dose (units required) = [desired (% of normal) – baseline (% of normal) AT-III level] X weight (kg)/1.4. Give by IV infusion over 10–20min. *Loading dose:* increase AT-III to 120% of normal. Subsequent dose should be based on AT-III levels obtained 20min post-infusion, every 12hrs, and before the next dose. Maintain AT-III levels at 80–120% of normal for 2–8 days. *See literature.*
COUMARINS			
Coumadin	warfarin	Prophylaxis and treatment of DVT or PE Prophylaxis and treatment of thromboembolic complications of atrial fibrillation and/or cardiac valve replacement Reduce risk of death, recurrent MI, and thromboembolic events post-MI	Individualize. IV: give as slow bolus dose over 1–2min into a peripheral vein. Initially 2–5mg orally or IV daily. *Usual maintenance:* 2–10mg daily. Variations in CYP2C9 or VKORC1 enzymes: use lower initial dose. Adjust dose and interval to maintain target INR 2.5 (2–3).
DIRECT THROMBIN INHIBITORS			
Angiomax	bivalirudin	Unstable angina undergoing PTCA PCI with provisional GP IIb/IIIa blocker use PCI with or at risk of HIT/HITTS	0.75mg/kg IV bolus (may give 0.3mg/kg bolus after 5min if needed), followed by 1.75mg/kg/hr during PCI/PTCA procedure. May continue infusion up to 4hrs post-op; after 4hrs, may give additional infusion of 0.2mg/kg/hr up to 20hrs, if needed. Give with aspirin 300–325mg daily. *Renal impairment:* CrCl <30mL/min: reduce infusion rate to 1mg/kg/hr; hemodialysis: 0.25mg/kg/hr.
Argatroban	argatroban	Prophylaxis and treatment of thrombosis in HIT/HITTS PCI with or at risk of HIT/HITTS	Before administering, discontinue heparin and obtain a baseline aPTT. Initially 2micrograms/kg/min continuous IV infusion; check aPTT 2hrs after starting; titrate to 1.5–3x baseline aPTT (max 100sec); max 10micrograms/kg/min. Initially 25micrograms/kg/min by IV infusion, and a 350micrograms/kg bolus by large bore IV line over 3–5min; ACT should be checked 5–10min after bolus, and titrate to therapeutic ACT of 300–450sec.
Iprivask	desirudin	DVT prophylaxis—hip replacement surgery	Administer 15mg SC inj (preferably in the abdomen or thigh) every 12hrs starting up to 5–15min before surgery (after induction of regional block anesthesia, if used); may continue for 9–12 days post-op.
Pradaxa	dabigatran	Reduce risk of stroke and systemic embolism in non-valvular atrial fibrillation	Swallow whole. CrCl>30mL/min: 150mg twice daily. Renal impairment (CrCl 15–30mL/min): 75mg twice daily; CrCl<15mL/min or on dialysis: not recommended.
Refludan	lepirudin	HIT and associated thromboembolic disease	≤110kg: Initial 0.4mg/kg slow IV bolus inj for 15–20sec, then 0.15mg/kg/hr as continuous infusion for 2–10 days or longer if needed. >110kg: max initial bolus dose 44mg; max initial infusion dose 16.5mg/hr.
FACTOR Xa INHIBITORS			
Arixtra	fondaparinux	DVT prophylaxis—abdominal surgery; hip replacement or fracture surgery; knee replacement Acute DVT or PE (with warfarin)	2.5mg SC once daily (after hemostasis is established, no earlier than 6–8hrs post-op) for 5–9 days. *Abdominal:* max 10 days. *Hip or knee replacement:* max 11 days. *Hip fracture:* give for up to 24 more days (max 32 days total). (<50kg): 5mg; (50–100kg): 7.5mg; (>100kg): 10mg; for all: give SC once daily for at least 5 days (usually 5–9 days; max 26 days) until adequately anticoagulated with warfarin (INR 2–3); start warfarin within 72hrs.
Eliquis	apixaban	Reduce risk of stroke and systemic embolism in non-valvular atrial fibrillation	5mg twice daily; 2.5mg twice daily if patient has any 2 of the following: age ≥80yrs, ≤60kg, or creatinine ≥1.5mg/dL. CrCl <15mL/min or dialysis: not recommended.
Xarelto	rivaroxaban	Reduce risk of stroke and systemic embolism in non-valvular atrial fibrillation DVT prophylaxis—hip or knee replacement	CrCl >50mL/min: 20mg once daily with PM meal; CrCl 15–50mL/min: 15mg once daily with PM meal; CrCl <15mL/min: not recommended. 10mg once daily 6–10hrs after surgery once hemostasis established. *Hip:* 35 days. *Knee:* 12 days

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THERAPY FOR THROMBOEMBOLIC DISORDERS* Part 2 of 3

Brand	Generic	Indication(s)	Usual Adult Dosing
ANTICOAGULANTS (continued)			
HEPARINS			
—	heparin sodium	Anticoagulation therapy	*See literature.* Individualize based on lab results and disease.
LOW MOLECULAR WEIGHT HEPARINS			
Fragmin	dalteparin	Prophylaxis of ischemic complications of unstable angina and non-Q-wave MI	120 Units/kg SC (max 10,000Units) every 12hrs until stabilized with aspirin 75–165mg once daily for 5–8 days.
		DVT prophylaxis—abdominal surgery	2500 Units SC once daily 1–2hrs before surgery and repeated once daily postoperatively. *High risk:* 5000 Units SC evening before surgery then once daily after surgery OR 2500 Units SC 1–2hrs before surgery followed by 2500 Units SC 12hrs later, then 5000 Units SC once daily. *Usual duration of administration:* 5–10 days.
		DVT prophylaxis—hip replacement	*Post-op start:* 2500 Units SC 4–8hrs after surgery, then 5000 Units SC once daily. *Pre-op (day of surgery):* 2500 Units SC 2hrs before surgery, followed by 2500 Units SC 4–8hrs after surgery, then 5000 Units SC once daily. *Pre-op (evening before surgery):* 5000 Units SC 10–14hrs before surgery, followed by 5000 Units SC 4–8hrs after surgery, then 5000 Units once daily. *Usual duration of administration:* 5–10 days after surgery.
		DVT prophylaxis—medical patients	5000 Units SC once daily (usually for 12–14 days).
		Extended treatment of symptomatic VTE in cancer	200 Units/kg once daily for 1 month, then 150 Units/kg SC once daily for months 2–6; max 18,000 Units/day.
Lovenox	enoxaparin	Prophylaxis of ischemic complications of unstable angina and non-Q-wave MI	1mg/kg SC every 12hrs for 2–8 days; with aspirin 100–325mg once daily.
		Acute STEMI (patients <75yrs); with or without subsequent PCI	30mg IV bolus + 1mg/kg SC dose then 1mg/kg SC every 12hrs at least 8 days (max 100mg for first 2 doses only); with aspirin 75–325mg once daily. If last dose given <8hrs before balloon inflation, no dose needed; >8hrs before balloon inflation: give 0.3mg/kg IV bolus.
		Acute STEMI (patients ≥75yrs)	0.75mg/kg SC every 12hrs (no bolus) at least 8 days (max 75mg for first 2 doses only); with aspirin 75–325mg once daily.
		DVT prophylaxis—abdominal surgery	40mg SC once daily 2hrs prior to surgery for up to 12 days.
		DVT prophylaxis—hip replacement	30mg SC every 12hrs or 40mg SC once daily starting 12hrs before surgery for up to 14 days.
		DVT prophylaxis—knee replacement	30mg SC every 12hrs for up to 14 days.
		DVT prophylaxis—medical patients	40mg SC once daily for up to 14 days.
		Acute DVT with or without PE (*inpatient*) Acute DVT without PE (*outpatient*)	*Inpatient:* 1mg/kg SC every 12hrs or 1.5mg/kg SC once daily for up to 17 days with warfarin; start warfarin within 72hrs. *Outpatient:* 1mg/kg SC every 12hrs for up to 17 days; with warfarin; start warfarin within 72hrs.
ANTIPLATELETS			
Persantine	dipyridamole	Adjunct prophylactic therapy to coumarin anticoagulants after cardiac valve replacement	75–100mg four times a day as an adjunct to usual warfarin therapy.
ANTIPLATELET + NONSTEROIDAL ANTIINFLAMMATORY DRUGS (NSAID)			
Aggrenox	dipyridamole and aspirin	Reduce risk of stroke after transient ischemia of the brain or complete ischemic stroke due to thrombosis	Take one capsule twice daily (AM and PM) with or without food; swallow whole.
GLYCOPROTEIN IIb/IIa (GP IIb/IIIa) BLOCKERS			
Aggrastat	tirofiban	ACS: managed medically or those undergoing PTCA or atherectomy	Give initial rate of 0.4micrograms/kg/min IV for 30min then 0.1micrograms/kg/min. Concomitant use with aspirin and heparin.
Integrilin	eptifibatide	ACS: managed medically and those undergoing PCI	180micrograms/kg IV bolus, then continuous IV infusion of 2micrograms/kg/min until discharge or CABG surgery, up to 72hrs. If PCI planned, continue infusion until discharge, or for up to 18–24hrs after procedure, whichever comes first, allowing up to 96hrs of therapy. Concomitant use with aspirin and heparin.
		PCI, including those undergoing intracoronary stenting	180micrograms/kg IV bolus immediately before PCI followed by 2micrograms/kg/min continuous infusion; repeat 180micrograms/kg IV bolus 10min after the 1st bolus; continue infusion until discharge, or for up to 18–24hrs, whichever comes first, minimum 12hr-infusion recommended. Concomitant use with aspirin and heparin.

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THERAPY FOR THROMBOEMBOLIC DISORDERS* Part 3 of 3

Brand	Generic	Indication(s)	Usual Adult Dosing
ANTIPLATELETS (continued)			
GLYCOPROTEIN IIb/IIa (GP IIb/IIIa) BLOCKERS (continued)			
Reopro	abciximab	Adjunct to PCI for prevention of cardiac ischemic complications	Give 0.25mg/kg IV bolus administered 10–60min before start of PCI, then a continuous IV infusion of 0.125micrograms/kg/min (max 10micrograms/min) for 12hrs. Use with heparin and aspirin.
		Unstable angina not responding to conventional therapy, undergoing PCI within 24hrs	Give 0.25mg/kg IV bolus followed by an 18–24hr IV infusion of 10micrograms/min, concluding 1hr after PCI.
PLATELET REDUCING AGENTS			
Agrylin	anagrelide	Treatment of thrombocythemia secondary to myeloproliferative disorders	Initially 0.5mg four times daily or 1mg twice daily for ≥1week. May increase dose by 0.5mg/day weekly to maintain normal platelet count; max 10mg/day or 2.5mg/dose.
$P2Y_{12}$ PLATELET INHIBITOR (cyclopentyltriazolopyrimidine)			
Brilinta	ticagrelor	Reduce thrombotic CV events in patients with ACS	*Loading dose:* 180mg once. *Maintenance:* 90mg twice daily. Take with aspirin: *loading dose:* 325mg; *maintenance:* 75–100mg daily.
$P2Y_{12}$ PLATELET INHIBITOR (thienopyridine)			
Effient	prasugrel	Reduce thrombotic CV events in patients with ACS, managed with PCI	*Loading dose:* 60mg once. *Maintenance:* 10mg once daily. <60kg: consider 5mg once daily. Take with aspirin (75mg–325mg daily).
Plavix	clopidogrel	Acute coronary syndrome (ACS)	75mg once daily. *Non-ST-segment acute coronary syndrome* (give with aspirin 75–325mg once daily): give one 300mg loading dose first. *ST-segment elevation acute MI* (give with aspirin, with or without thrombolytics): may start with or without a loading dose. CYP2C19 poor metabolizers: may need higher doses.
		Recent MI, stroke or established peripheral arterial disease	75mg once daily. CYP2C19 poor metabolizers: may need higher doses.
—	ticlopidine	Reduce risk of thrombotic stroke in aspirin intolerant patients who've had a completed thrombotic stroke	250mg twice daily with food.
		Reduce incidence of subacute stent thrombosis for successful coronary artery stenting	250mg twice daily with food together with antiplatelet doses of aspirin for up to 30 days of therapy following successful stent implantation.
ANTICOAGULANTS			
TISSUE PLASMINOGEN ACTIVATORS (tPA)			
Activase	alteplase	Management of acute MI	*Max total dose:* 100mg. *Accelerated infusion:* (>67kg): 15mg IV bolus, then 50mg infused for 30min, then 35mg infused for 60min; (≤67kg): 15mg IV bolus, then 0.75mg/kg (max 50mg) infused for 30min, then 0.5mg/kg (max 35mg) for 60min. *3-hr infusion:* (>65kg): 60mg infused for 1hr (of which 6–10mg is given as bolus), then 20mg/hr for 2hrs. (≤65kg): 1.25mg/kg for 3hrs (as described above). Concomitant use with heparin.
		Management of acute ischemic stroke	0.9mg/kg (max 90mg) infused for 60min with 10% of total dose given as initial IV bolus for 1min.
		Management of acute massive PE	100mg IV infusion over 2hrs. Concomitant use with heparin.
Retavase	reteplase	Management of acute MI	Give 10 Units as IV bolus over 2min; repeat dose 30min after initiation of 1st bolus.
TNKase	tenecteplase	Reduce mortality associated with AMI	Give as single IV bolus over 5sec. (<60kg): 30mg; (≥60kg–<70kg): 35mg; (≥70kg–<80kg): 40mg; (≥80kg–<90kg): 45mg; (≥90kg): 50kg; Max: 50mg.

NOTES

ACS = acute coronary syndrome; ACT = activated clotting time; AMI = acute myocardial infarction; CV = cardiovascular; DVT = deep vein thrombosis; HIT = heparin-induced thrombocytopenia; HITTS = HIT and thrombosis syndrome; MI = myocardial infarction; PCI = percutaneous coronary intervention; PE = pulmonary embolism; PM = evening; PTCA = percutaneous transluminal coronary angioplasty; SC = subcutaneous; VTE = venous thromboembolism

*Usual adult dosing based on manufacturers' PI. For more information see individual drug monographs. (Rev. 3/2013)