THROMBOEMBOLIC DISORDERS: TREATMENTS (Part 1 of 3)

Generic	Brand	Form	Indication	Adult Dose*
ANTICOAGULANTS				
Anticoagulant Proteins				
protein C concentrate [human]	**Ceprotin**	inj	Venous thrombosis and purpura fulminans in severe congenital Protein C deficiency	Give by IV infusion only. <10kg: max rate 0.2mL/kg/min; ≥10kg: max rate 2mL/min. Individualize. *Acute episodes/short term prophylaxis:* initially 100–120 IU/kg, then 60–80 IU/kg every 6hrs for 3 doses (adjust dose to maintain target peak protein C activity of 100%); maintenance: 45–60 IU/kg every 6 or every 12hrs (maintain trough protein C level above 25% for duration of therapy); continue until desired anticoagulation achieved. *Long-term prophylaxis:* 45–60 IU/kg every 12hrs (maintain trough protein C level above 25%).
Antithrombins				
antithrombin [recombinant]	**ATryn**	inj	Prevention of peri-operative and peri-partum thromboembolic events in hereditary antithrombin deficiency	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% of normal. See full labeling.
antithrombin III [human]	**Thrombate III**	inj	Hereditary antithrombin III (AT-III) deficiency in surgical or obstetrical procedures and thromboembolism	Infuse over 10–20mins. Dose (units required) = [desired (% of normal) – baseline (% of normal) AT-III level] × weight (kg)/1.4. 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 full labeling.
Coumarins				
warfarin	**Coumadin**	tabs	DVT/PE prophylaxis or treatment	Initially 2–5mg daily. *Usual maintenance:* 2–10mg once daily; adjust based on INR. *CYP2C9 or VKORC1 enzyme variations, elderly, debilitated, Asians:* use lower initial and maintenance doses.
			Atrial fibrillation and/or cardiac valve replacement; post-MI	
Direct Thrombin Inhibitors				
argatroban	—	inj	Prophylaxis and treatment of thrombosis in HIT	Discontinue heparin and obtain baseline aPTT before initiation. Initially 2mcg/kg/min by IV infusion; check aPTT 2hrs after starting. Titrate to 1.5–3x baseline aPTT (max 100sec); max 10mcg/kg/min.
			PCI with or at risk of HIT	350mcg/kg bolus by large bore IV line over 3–5mins, then infuse at 25mcg/kg/min. Check ACT 5–10mins after bolus; titrate based on ACT to therapeutic ACT of 300–450secs (see full labeling).
bivalirudin	**Angiomax**	inj	Unstable angina undergoing PTCA; PCI with or at risk of HIT/HITTS; PCI with provisional GPI use	Give with aspirin 300–325mg daily. 0.75mg/kg IV bolus (may give additional bolus of 0.3mg/kg after 5mins, if needed in those without HIT/HITTS), followed by 1.75mg/kg/hr for duration of procedure. May continue infusion up to 4hrs post-procedure; after 4hrs, may give additional infusion of 0.2mg/kg/hr up to 20hrs, if needed.
dabigatran	**Pradaxa**	caps	DVT/PE treatment; reduce DVT/PE recurrence	*CrCl>30mL/min:* 150mg twice daily (if treatment, give after 5–10 days of parenteral anticoagulation). *CrCl ≤30mL/min or on dialysis:* not recommended.
			DVT/PE prophylaxis post hip replacement	*CrCl>30mL/min:* 110mg for first day (given 1–4hrs post surgery and after hemostasis achieved), then 220mg daily for 28–35 days. *CrCl ≤30mL/min or on dialysis:* not recommended.
			Reduce risk of stroke and systemic embolism in non-valvular AF	*CrCl>30mL/min:* 150mg twice daily. *Renal impairment (CrCl 15–30mL/min):* 75mg twice daily; *CrCl<15mL/min or on dialysis:* not recommended. *Moderate renal impairment (CrCl 30–50mL/min) with concomitant dronedarone or systemic ketoconazole:* 75mg twice daily.
lepirudin	**Refludan**	inj	HIT and associated thromboembolic disease	≤110kg: initially 0.4mg/kg slow IV bolus for 15–20secs, 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. Adjust dose based on aPTT ratio; usual target range (1.5–2.5).
Factor Xa Inhibitors				
apixaban	**Eliquis**	tabs	DVT/PE treatment	10mg twice daily for 7 days, then 5mg twice daily.
			Reduce DVT/PE recurrence	2.5mg twice daily after at least 6mos of DVT/PE treatment.
			DVT prophylaxis post hip or knee replacement	2.5mg twice daily; initially give 12–24hrs after surgery. *Hip:* treat for 35 days. *Knee:* treat for 12 days.
			Reduce risk of stroke and systemic embolism in non-valvular AF	5mg twice daily; 2.5mg twice daily if patient has any 2 of the following: age ≥80yrs, ≤60kg, or creatinine ≥1.5mg/dL.
betrixaban	**Bevyxxa**	caps	VTE prophylaxis (hospitalized patients)	Initially 160mg as a single dose, then 80mg once daily for 35–42 days. *Severe renal impairment (CrCl ≥15–<30mL/min) or concomitant P-gp inhibitors:* initially 80mg as a single dose, then 40mg once daily for 35–42 days.
fondaparinux	**Arixtra**	inj	DVT/PE treatment (with warfarin)	*<50kg:* 5mg; *50–100kg:* 7.5mg; *>100kg:* 10mg.Give SC once daily for at least 5 days and until INR 2–3 (usually 5–9 days; max 26 days); start warfarin within 72hrs.
			DVT prophylaxis post surgery	2.5mg SC once daily (after hemostasis is established, no earlier than 6–8hrs post-op) for 5–9 days. *Hip or knee replacement:* max 11 days. *Hip fracture:* give for up to 24 more days (max 32 days total).*Abdominal:* max 10 days.

continued

Generic	Brand	Form	Indication	Adult Dose*
ANTICOAGULANTS (continued)				
Factor Xa Inhibitors (continued)				
rivaroxaban	**Xarelto**	tabs	DVT/PE treatment	15mg twice daily for first 21 days, then 20mg once daily for the remaining treatment. *CrCl<15mL/min:* avoid.
			Reduce DVT/PE recurrence	10mg once daily (after ≥6mos of standard anticoagulant therapy). *CrCl<15mL/min:* avoid.
			DVT prophylaxis post hip or knee replacement	10mg once daily (6–10hrs after surgery once hemostasis established) for 35 days (hip) or 12 days (knee). *CrCl<15mL/min:* avoid.
			VTE prophylaxis in acutely ill medical patients (in hospital and after discharge)	10mg once daily for 31–39 days. *CrCl<15mL/min:* avoid.
			Reduce risk of stroke and systemic embolism in non-valvular AF	*CrCl>50mL/min:* 20mg once daily with PM meal; *CrCl ≤50mL/min:* 15mg once daily with PM meal.
			Reduce risk of major CV events in chronic CAD or PAD (with aspirin)	2.5mg twice daily with aspirin
Heparins				
heparin sodium	—	inj	VTE, peripheral arterial embolism, coagulopathy treatment	See full labeling. Individualize based on lab results and disease.
			VTE, peripheral arterial embolism prophylaxis	
			AF with embolization	
			Anticoagulant in surgery, transfusions, extracorporeal circulation, dialysis	
Low Molecular Weight Heparins				
dalteparin	**Fragmin**	inj	Extended VTE treatment (cancer patients)	200 IU/kg SC once daily for 30 days, then 150 IU/kg SC once daily for 2–6mos; max 18,000 IU/day.
			DVT prophylaxis	*Hip replacement:* post-op start: 2500 IU 4–8hrs after surgery, then 5000 IU once daily (≥6hrs after 1st dose); pre-op start day of surgery: 2500 IU within 2hrs before surgery, then 2500 IU 4–8hrs after surgery, then 5000 IU once daily (≥6hrs after previous dose); pre-op evening before surgery: 5000 IU 10–14hrs before surgery, then 5000 IU 4–8hrs after surgery, then 5000 IU once daily (allow 24hrs between doses); for all hip replacement regimens: usually treat for 5–10 days; max up to 14 days post-op. *Abdominal surgery:* 2500 IU once daily (usually for 5–10 days) starting 1–2hrs pre-op; for high risk of thromboembolism (eg, malignancy): see full labeling. *Severely restricted mobility:* 5000 IU once daily (usually for 12–14 days).
			Prophylaxis of ischemic complications in unstable angina and non-Q-wave MI	120 IU/kg SC (max 10,000 IU) every 12hrs until stabilized with aspirin 75–165mg once daily for 5–8 days.
enoxaparin	**Lovenox**	inj	DVT treatment: with or without PE (inpatient); without PE (outpatient)	*Inpatient:* 1mg/kg SC every 12hrs or 1.5mg/kg SC once daily with warfarin. *Outpatient:* 1mg/kg SC every 12hrs with warfarin. *Both:* start warfarin usually within 72hrs, continue enoxaparin at least 5 days and until INR 2–3 (usually 7 days; usual max 17 days).
			DVT prophylaxis	*Knee replacement:* 30mg SC every 12hrs for 7–10 days; max 14 days (1st dose 12–24hrs post-op). *Hip replacement:* 30mg SC every 12hrs (1st dose 12–24hrs post-op), or 40mg SC once daily (1st dose 9–15hrs pre-op), for 7–10 days, then 40mg SC once daily for 3wks. *Abdominal surgery:* 40mg SC once daily (1st dose 2hrs pre-op) for 7–10 days; max 12 days. *Severely restricted mobility due to acute illness:* 40mg SC once daily for 6–11 days, max 14 days.
			Prophylaxis of ischemic complications in unstable angina and non-Q-wave MI	1mg/kg SC every 12hrs for at least 2 days, with aspirin 100–325mg once daily, until stable (usually 2–8 days; usual max 12.5 days).
			Acute STEMI	*<75yrs:* 30mg IV bolus + 1mg/kg SC, then 1mg/kg SC every 12hrs (max 100mg for 1st 2 doses only, then 1mg/kg dosing for remaining doses). *≥75yrs:* 0.75mg/kg SC every 12hrs (no bolus; max 75mg for 1st 2 doses only, then 0.75mg/kg dose for remaining doses). *Both:* give with aspirin 75–325mg once daily; treat usually for 8 days or until hospital discharge.
ANTIPLATELETS				
anagrelide	**Agrylin**	caps	Thrombocythemia due to myeloproliferative disorders	*≥16yrs:* initially 0.5mg 4 times daily or 1mg twice daily for ≥1wk. May increase dose by 0.5mg/day weekly to maintain normal platelet count; max 10mg/day or 2.5mg/dose. *Moderate hepatic impairment:* initially 0.5mg/day.
dipyridamole + aspirin	—	caps	Reduce risk of stroke in TIA or ischemic stroke	1 cap twice daily (AM and PM). Alternative if intolerable headaches: switch to 1 cap at bedtime and low-dose aspirin in AM; return to usual regimen within 1wk.

continued

THROMBOEMBOLIC DISORDERS: TREATMENTS (Part 3 of 3)

Generic	Brand	Form	Indication	Adult Dose*
ANTIPLATELETS *(continued)*				
Glycoprotein IIb/IIIa (GP IIb/IIIa) Inhibitors				
eptifibatide	**Integrilin**	inj	ACS	180mcg/kg IV bolus, then continuous IV infusion of 2mcg/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. *CrCl <50mL/min:* reduce rate to 1mcg/kg/min. Concomitant use with aspirin and heparin.
			PCI, including those undergoing intracoronary stenting	180mcg/kg IV bolus, then 2mcg/kg/min infusion; repeat 180mcg/kg IV bolus 10mins after 1st bolus; continue infusion until discharge, or for up to 18–24hrs, whichever comes first, minimum 12-hr infusion recommended. *CrCl <50mL/min:* reduce rate to 1mcg/kg/min. Concomitant use with aspirin and heparin.
tirofiban	**Aggrastat**	inj	Reduce thrombotic CV events in non-ST elevation ACS	25mcg/kg IV within 5mins, then 0.15mcg/kg/min for up to 18hrs. *Renal impairment (CrCl ≤60mL/min):* 25mcg/kg IV within 5mins, then 0.075mcg/kg/min for up to 18hrs.
P2Y12 Platelet Inhibitors				
clopidogrel	**Plavix**	tabs	Reduce risk of MI and stroke in ACS	Initially 300mg loading dose, then 75mg once daily. Take with aspirin.
			Reduce risk of MI and stroke in recent MI, stroke or PAD	75mg once daily.
prasugrel	**Effient**	tabs	Reduce thrombotic CV events in ACS	60mg loading dose, then 10mg once daily. <60kg: consider 5mg once daily. Take with aspirin 75mg–325mg daily.
ticagrelor	**Brilinta**	tabs	Reduce risk of CV death, MI and stroke in ACS or history of MI	Initially 180mg loading dose, followed by 90mg twice daily for 1st yr, then 60mg twice daily thereafter. Take with aspirin 75–100mg daily.
			Stent thrombosis prophylaxis	
			Reduce risk of a first MI or stroke in CAD	60mg twice daily.
ticlopidine	—	tabs	Reduce risk of thrombotic stroke (aspirin-intolerant)	250mg twice daily with food.
Protease-Activated Receptor-1 (PAR-1) Antagonist				
vorapaxar	**Zontivity**	tabs	Reduce thrombotic CV events in MI or PAD	2.08mg once daily. Take with aspirin and/or clopidogrel based on indications.
THROMBOLYTICS				
Tissue Plasminogen Activators (tPA)				
alteplase	**Activase**	inj	Acute MI	Max 100mg total dose. *Accelerated infusion* (≤67kg): 15mg IV bolus, then 0.75mg/kg (max 50mg) infused over 30min, then 0.5mg/kg (max 35mg) over 60min; (>67kg): 15mg IV bolus, then 50mg infused over 30min, then 35mg infused over 60min; *3-hour infusion* (≥65kg): 60mg infused in the 1st hr (of which 6–10mg is given as bolus), then 20mg/hr for 2hrs; (<65kg): 1.25mg/kg over 3hrs (of which 0.075mg/kg as bolus, 0.675mg/kg for the rest of the 1st hr, then 0.25mg/kg/hr for 2hrs). May use concomitantly with heparin.
			Acute ischemic stroke	Initiate within 3hrs of symptom onset. 0.9mg/kg (max 90mg total dose) infused over 60min with 10% of total dose given as initial IV bolus over 1min.
			Acute massive PE	100mg IV infusion over 2hrs. May use heparin after infusion.
reteplase	**Retavase**	inj	Acute MI	10 Units as IV bolus over 2min; repeat dose 30min after initiation of 1st bolus.
tenecteplase	**TNKase**	inj	Acute MI	Give as single IV bolus over 5sec. <60kg: 30mg; ≥60–<70kg: 35mg; ≥70–<80kg: 40mg; ≥80–<90kg: 45mg; ≥90kg: 50mg. Max: 50mg.

NOTES

Key: ACS = acute coronary syndrome; ACT = activated clotting time; AF = atrial fibrillation; AMI = acute myocardial infarction; CAD = coronary artery disease; CV = cardiovascular; DVT = deep vein thrombosis; GPI = glycoprotein IIb/IIIa inhibitors; HIT = heparin-induced thrombocytopenia; HITTS = HIT and thrombosis syndrome; MI = myocardial infarction; NSTEMI = non-ST-elevation MI; PAD = peripheral artery disease; PCI = percutaneous coronary intervention; PE = pulmonary embolism; PM = evening; PTCA = percutaneous transluminal coronary angioplasty; SC = subcutaneous; STEMI = ST-elevation MI; VTE = venous thromboembolism

*For children's dosing, see drug monograph or full labeling.

Not an inclusive list of medications, official indications, and/or dosing details. Please see drug monograph at www.eMPR.com and/or contact company for full drug labeling.

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