Drug	Action	Half-life	The peak	Bioavailability	How to use	Parameters require monitoring	Adverse effects	Antidote	Additional notes
Unfractionated Heparin (UFH)	1. Inactivates thrombin "IIa" (form a ternary complex bridging between antithrombin & thrombin) 2. Inactivates factor Xa (binds to antithrombin without forming a bridge)	*30 - 90 min. - dose dependant - Zero order elimination	At 3 hours	30% because it's metabolized by endothelial cells	- IV, SC - Cannot be given orally - IM is contraindicated	- Platelet count - APTT: Shouldn't increase 2/3 times normal	- Bleeding - Heparin induced thrombocytopenia (HIT): leads to atrial thromboembolic events. - Bone lose & osteoporosis	Protamine sulfate (neutralize UFH in 5 min & action persists for 2 hours)	doesn't affect the already formed thrombus
Low Molecular Weight Heparin (LMWHs)	↑ activity of antithrombin against factor Xa - has limited activity against thrombin (IIa)	*3 - 6 hours - dose independant - 1st order elimination	At 3 - 5 hours	90%	SC	- No routine monitoring required (except for obese individuals, children & pregnant ladies)	- Bleeding - HIT is 3 times < UFH - Osteoporosis & osteopenia	Protamine sulfate	- Ex: Enoxaparin, Dalteparin - Unit here is mg (we are sure of the molecular weights)
Fondaparinux	- binds reversibly to antithrombin, - inhibits only factor Xa activity	19 hours	- 2 h "after a single dose" - 3h "with repeated once daily dosing"		SC		- Bleeding - Rare cause of HIT	No antidote	- Effective in prevention of venous thromboembolism (VTE) - It's effect persists for 2 - 4 days
Lepirudin	Irreversible inhibitor, inactivates fibrin-bound thrombin				IV SC	APTT		No antidote	used for thrombosis related to HIT
Bivalirudin	- inhibits both circulating & clot-bound thrombin, reversibly - inhibits thrombin-mediated platelet activation & aggregation	25 min			IV	Thrombin inhibitor assay			- used in percutaneous coronary intervention (PCI) & for HIT - It's contraindicated in severe renal impairment.
Warfarin	- inhibits the reduction of vitamin K epoxide - No effect on performed clotting factors	- full antithrombotic effect is Not achieved for at least 6 days. - its pharmacologic effect depends on coagulation protein elimination half-lives. - we can avoid skin necrosis by overlapping between warfarin & heparin in the 1st week - CYP2C9 is responsible for metabolism of S-enantionmer of warfarin.				requires continuous patient monitoring	- Bleeding - Purple toe syndrome - Warfarin induced skin necrosis	Vitamin K Serious bleeding → IV no serious bleeding → oral	Half lives (hours) II = 72, VII = 6 IX = 24, X = 40 protein C = 8 protein S = 30
Dabigatran	prodrug, selective, reversible, direct factor IIa inhibitor	16	Idarucizumab: reverses the dabigatran effect following IV administration			Dabigatran anticoagulant	- gastrointestinal complaints - bleeding	*These 4 drugs are considered DOACs "direct acting anticoagulants" *Can be used for extended VTE treatment after the first 6 months of anticoagulant therapy.	
Rivaroxaban, apixaban & edoxaban	potent & selective inhibitors of both free & clot-bound factor Xa	10	Rivaroxaban & apixaban: are subject to interactions involving inhibitors or inducers of CYP3A4						