

## Parenteral Anticoagulants

Indirect



Direct



Differences	HMWH	LMWH eg: Enoxaparin – Dalteparin - Danaproid.	Lepirudin
	↑ activity of a antithrombin III against active factor II, IX, X, XI, and XII.	↑↑ activity of antithrombin III against Xa	-acts via direct binding to active site on activated factor II (thrombin) - is antithrombin III- independent. - Prepared by recombinant DNA technology
<b>Bleeding tendency</b>	High	Low	-----
<b>thrombocytopenia</b>	High	Low	-----
<b>T ½</b>	Short	Long ( double )	-----
<b>Bioavailability</b>	Low	High	-----
<b>Control of dose</b>	aPTT, WBC.	Plasma factor Xa	It is monitored by aPTT
<b>Administration</b>	3 - 4 dose / day ( I.V. or S.C )	1 - 2 dose / day S.C. only	Has short duration of action (1 hr)  Given I.V.
<b>Efficacy</b>	Equal	Equal	-----
<b>MW</b>	5000 - 30.000	2000 - 9000	-----
<b>use</b>	----	----	Used for treatment of thrombosis in HIT patients.

Oral anticoagulants

	MOA	PK	Side effect	Drug interactions	Contraindications
<b>warfarin</b>	<p>-are vitamin K antagonists (vitamin K epoxide reductase inhibitors).</p> <p>-reduced vitamin K is required for hepatic synthesis of several clotting factors II, VII, IX, X (gamma carboxyglutamic acid residues).</p> <p>-This results in the production of inactive clotting factors lacking <math>\gamma</math>-carboxyglutamyl residues</p>	<p>-Taken orally.</p> <p>-Highly bound to plasma protein (low Vd).</p> <p>-Long plasma half life (36 h).</p> <p>-Cross placenta</p> <p>-Metabolized in the liver by cytochrome P450</p> <p>-Excreted in urine and stool.</p> <p>-Delayed onset of action (12 h).</p> <p>-Acts in vivo only.</p>	<ol style="list-style-type: none"> <li>1. Hemorrhage : treated by vitamin K 1</li> <li>2. Soft tissue necrosis</li> <li>3. Drug interactions</li> <li>4. Teratogenicity: <ul style="list-style-type: none"> <li>■ hemorrhagic disorder</li> <li>■ abnormal bone formation in the fetus.</li> </ul> </li> <li>5. slow onset of action</li> </ol>	<ol style="list-style-type: none"> <li>1. Broad spectrum antibiotics sulfonamides increase warfarin action</li> <li>2. Hepatic P450 Inhibitors increase warfarin action Cimetidine, erythromycin</li> <li>3. Hepatic P450 Inducers decrease warfarin action rifampicin, phenobarbitone</li> <li>4. NSAIDs, aspirin</li> </ol>	<p>-Pregnancy</p> <p>-Hypoprothrombinemia (Liver disease).</p>