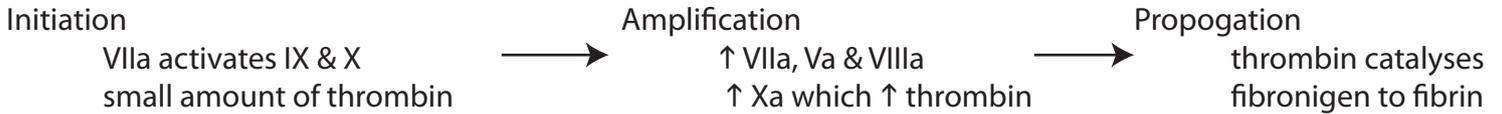


Second 2010  
VIVA 6

This viva will test your knowledge on blood coagulation, and the pharmacology of heparin. Candidates had a good knowledge of the coagulation cascade. Heparin pharmacology proved to be an area of weakness, particularly concepts relating to loading dose, and its dose-response characteristics.

**“Describe the coagulation cascade”**



In vitro

Intrinsic 12 - 11 - 9 - 10

Extrinsic TF - 7 - 10

Common 10 - prothrombin - thrombin - fibrinogen - fibrin

**“Please describe the pharmacology of heparin”**

Heparin is an anionic, mucopolysaccharide, organic acid

It occurs naturally in the liver and mast cell granules.

It has a molecular weight of 5000-25000 Daltons

Activates antithrombin which then inhibits clotting factors thrombin and factor Xa

Side effects include; bleeding, HITS, osteoporosis, transient transaminitis

Bioavailability is reduced due to endothelial binding (SC)

distribution is characterised by very high protein binding

metabolism is hepatic via heparinases / desulfation, variable half life due to protein binding

half life is 30 - 150 mins depending on dose

urine as inactive metabolites, little change in renal failure

**“How would you calculate a loading dose of heparin?”**

Loading doses are usually calculated according to hospital protocols. Due to its variable half life, small doses are rapidly eliminated, hence the need for a bolus dose initially.

**“How would you monitor the effect of heparin”**

APTT

**“Can you discuss any agents which may be used in heparin overdose”**

Protamine

is a purified mixture of low molecular weight cationic proteins prepared from fish sperm.

it is used to reverse the effects of heparin and to prolong the action of insulin.

Mechanism of action

It is a strongly basic compound which complexes with the strongly acidic compound of heparin to form an inactive salt which is subsequently removed by the reticuloendothelial system. The intrinsic anticoagulant activity appears to be due to inhibition of the formation and activity of thromboplastin.

Side effects

Cardiovascular

Release of histamine from mast cells causes vasodilation and hypotension

Complement activation leads to decreased contractility

Pulmonary hypertension and acute right ventricular dilatation has been reported

The role of NO in these mechanisms remain controversial

Respiratory

Pulmonary hypertension and anaphylactoid reactions can lead to dyspnoea

Haematological