Q5 Outline the mechanism of action of drugs used to promote haemostasis (March 2009)

Haemostasis → the physiological processes which arrest bleeding

Drugs which reduce blood flow:

- Adrenaline → causes local vasoconstriction
- Wound glue → physical barrier to reduce bleeding

Drugs which increase the available coagulation factors:

- Desmopressin → increases plasma levels of FVIII and von Willebrand Factor, which promote formation of the platelet plug and participate in the coagulation cascade
- Vitamin K → required for the gamma-carboxylation of coagulation factors II, VII, IX and X to activate them in the clotting cascade. Also activates proteins C and S. Vitamin K may be given to reverse supratherapeutic INR associated with warfarin use; may also be given in liver disease or other situations when the INR is elevated and potential bleeding is a concern.
- Prothrombinex → powder for injection containing 500IU each of FII, IX and X, low levels of FV and VII, 25mg of antithrombin which participate in the coagulation cascade as normal
- Biostate → Human derived FVIII/VWF complex which can participate in the coagulation cascade
- Other factor concentrates

Drugs which reduce clot breakdown:

- Tranexamic acid → acts by inhibiting the binding of plasminogen and plasmin to fibrin, to inhibit fibrinolysis of a formed clot
- Aprotinin → a naturally occurring proteolytic enzyme inhibitor acting on trypsin, plasmin and tissue kallikrein. It inhibits the fibrinolytic activity of the streptokinase-plasminogen complex and decreases activation of the clotting cascade.
- Aminocaproic acid → Binds competitively to plasminogen, blocks the binding of plasminogen to fibrin and subsequent conversion to plasmin, resulting in inhibition of fibrinolysis
- Osteogren → inhibits Protein C (naturally occurring regulator of haemostasis)

Drugs which reverse anticoagulants:

- Vitamin K → as above
- Protamine sulfate → binds to heparin in the circulation to produce a stable inactive complex for removal by the reticuloendothelial system. Useful in cases of bleeding associated with heparin use.