1. mention mechanism of action of heparin

Its action depends on the presence of anatural clotting inhibitor called antithrombin III.

♣ Small quantities of heparin can activate antithrombin III, inhibiting several clotting factors especially [factor X & thrombin (factor II)].

2. Enumerate therapeutic uses of of heparin

3. Enumerate side effects of heparin

1-Bleeding is the most common and dangerous adverse effect can be reversed by antidote protamine sulfate a basic +ve charged protein that combines with heparin

2-Heparin-induced Thrombocytopenia (HIT) (autoimmune) arises from the development of antibodies to the heparin–platelet factor 4 complex.

3-Hematoma if given IM

4-Osteoporosis

5-Alopecia

4. Compare between heparin and enoxaparin

Type of heparin	Unfractionated heparin	LMWH (Enoxaparin)
Molecular weight range	High	Low
Anti-factor Xa activity	Less specific	More specific
Non-specific binding to plasma proteins	High	Low
Bioavailability after s. c. injection	Low (due to binding to s.c. tissue)	High
Half-life	Short (given 3 times/d)	Long (given once/d)
Thrombocytopenia	Common (10%)	Less common (<2%) less affinity for platelet factor 4
Risk of bleeding	High	Low
Lab monitoring	APTT (Essential)	Extent of inhibition of factor Xa,(May be unnecessary)

5. Enumerate 3 drugs that potentiate the action of warfrin

Microsomal enzyme inhibitors (e.g. cimetidine) ↓ metabolism of warfarin.

♣ Oral antibiotics: ↓ vit K synthesis by killing the gut flora

♣ Liquid paraffin: ↓ vit K absorption

♣ NSAIDs: displace warfarin from pp

6. Enumerate 3 drugs that decrease the action of warfarin

♣ Microsomal enzyme inducers (e.g. phenobarbital) ↑ metabolism of warfarin.

♣ Oral contraceptives and vit K. ↑ synthesis of clotting factors

♣ Aluminum hydroxide: ↓ warfarin absorption

7. Mention mechanism of action of warfarin

Warfarin inhibits vitamin K epoxide reductase enzyme In the liver leading to inhibition of formation of the active form of vitamin K → ↓ synthesis of vitamin Kdependent clotting factors (II, VII, IX, and

8. Enumerate side effects of warfarin

Bleeding: gingival bleeding, nose bleeding.

♣ Teratogenicity: serious birth abnormalities

♣ Serious thrombosis: on sudden withdrawal

9. Mention treatment of bleeding due to warfarin over dose

a) Immediate stopping of the drug.

b) Fresh frozen plasma (FFP).

c) Vitamin K1 (phytomenadione): to enhance synthesis of clotting factors

10. Compare between heparin and warfarin

	Heparin	Warfarin
Source	Natural.	Synthetic
Action	In vivo and in vitro	In vivo
Kinetics	Ineffective orally Not cross the placenta or milk	Absorbed from GIT Cross the placenta and milk
Mech	Activates antithrombin III	Compete with Vit. K. on vit K epoxide reductase
Route	S.C.	Oral
Control	Blood coagulation time APTT	Prothrombin time , INR
Onset	Immediate	Delayed1-3 days
Duration	Short 2-4 hrs	Long 4-7 days
Antidote	Protamine sulphate + Fresh blood transfusion	Vitamin K +Fresh blood transfusion

11. Mention mechanism of action of fibrinolytic drugs

Activation plasminogen (inactive) to active plasmin which breaks down fibrin clots

12. Enumerate therapeutic uses of fibrinolytic drugs

♣ Acute Coronary Syndrome (within 12 hrs): The maximum benefit is obtained if treatment is given within 90 minutes of the onset of pain.

♣ Pulmonary embolism

♣ Other arterial thrombosis

13. Enumerate side effects of streptokinase

Systemic bleeding:

ﻨ Allergy, fever, and hypotension during i.v. infusion

14. Mention mechanism of action of aspirin as antiplatlets

♣ Irreversible inhibition of COX-1 enzyme → ↓ TXA2 → ↓ platelet aggregation.

♣ Irreversible acetylation of platelet cell membranes → ↓ platelet adhesions.

♣ Decrease platelet ADP synthesis → decrease platelet accumulation

15. Why use of aspirin in low dose as antiplatlet

♣ At higher doses (> 325 mg/day), aspirin may decrease endothelial synthesis of PGI2, which inhibits platelet aggregation (protective).

♣ Low doses (75-150 mg/day) ↓ synthesis of platelet TXA2 more than PGI2 in endothelial cells and avoid this effect

16. When to stop aspirin before surgery

♣ Platelet do not contain DNA or RNA they cannot synthesize new COX1 ♣ Inhibition is effective for the life of platelet (7-9 days)

17. Mention mechanism of action of clopidogrel and its uses

Irreversibly inhibits ADP mediated platelet aggregation

Uses

Prophylaxis of thrombosis in both cerebrovascular and cardiovascular disease (secondary prevention)

18. Mention mechanism of action of abciximab

Monoclonal antibody blocks glycoprotein IIb/IIIa receptor The final common pathway of platelet aggregation

19. Enumerate 3 local hemostatics

♣ Physical methods: application of pressure, cooling or heat coagulation.

♣ Vasoconstrictor drugs: e.g. adrenaline nasal pack in epistaxis.

♣ Astringents: drugs which precipitate surface proteins e.g., Alum sulphate.

♣ Thrombin and thromboplastin: applied on the bleeding surface as powders.

♣ Fibrin and fibrinogen: available as dried sheets and used in surgery.

20. Enumerate 3 systemic hemostatics

♣ Vitamin K: essential for synthesis of factors II, VII, IX, X by the liver.

♣ Fresh blood or plasma transfusion: as sources of coagulation factors.

♣ Aminocaproic acid and Tranexamic acid: inhibitors of fibrinolytic system.

21. Enumerate 3 uses of vit k

To reverse bleeding episodes caused by overdose of warfarin, salicylates.

♣ To correct vitamin deficiency caused by dietary deficiency, or in patients receiving oral antibiotics.

♣ To prevent hypothrombinemia of the newborn

22. Enumerate uses of aminocaproic acid / tranexemic acid

To stop bleeding caused by toxicity of fibrinolytic drugs

♣ To prevent bleeding from tissues rich in plasminogen activators e.g., lung, prostatic surgery, menorrhagia and ocular trauma.

♣ Prophylaxis for rebleeding from Intracranial aneurysm

23. Mention mechanism of action of glucocorticoids as immunosuppressive drug

♣ Interfere with the cell cycle of activated T cells (inhibit IL2).

♣ Decreased production of T and B lymphocytes and macrophages, involution of lymphoid tissue

♣ Decreased function of T and B lymphocytes, and reduced responsiveness to cytokines.

♣ Inhibit the functions of tissue macrophages and other antigen-presenting cells.

♣ Inhibition of complement system.

24. Enumerate uses of glucocorticoids

♣ Rheumatoid arthritis.

♣ Bronchial asthma

♣ First-line immunosuppressive therapy for both solid organ and hematopoietic stem cell transplantation.

25. Enumerate side effects of glucocorticoids

- Increased susceptibility to infection. - Osteoporosis - Fluid retention - Electrolyte imbalances (especially hypokalemia) - Raised blood pressure - Elevated blood glucose levels - Iatrogenic Cushing (moon face buffalo hump

26. Mention mechanism of action of cyclosporine

Cyclosporine binds to cyclophilin then cyclosporine and cyclophilin form a complex that inhibits the cytoplasmic phosphatase, calcineurin, which is necessary for the activation of a T-cell-specific transcription factor. NF-AT, is involved in the synthesis of interleukins (eg, IL-2, IL-3, IFN-γ) by activated T cells.

27. Enumerate 2 uses and 4 side effects of cyclosporine

Uses

♣ Cadaveric transplants of the kidney, pancreas, liver, and cardiac transplants.

♣ Ocular graft-versus-host disease.

♣ Psoriasis.

Adverse effects

- Nephrotoxicity - Hepatotoxicity - Bone marrow toxicity. – Seizures
- Hypertension - Hyperglycemia - Hyperkalemia - Hirsutism (hypertricosis)

28. Mention mechanism of action of tacrolimus

bind to the immunophilin FK-binding protein (FKBP). Both complexes inhibit calcineurin.

29. Mention mechanism of action of azathioprine

♣ Interferes with purine nucleic acid metabolism and stops lymphoid cell proliferation ♣ It inhibits both denovo and salvage pathway of purine synthesis

30. 3numerate 2 uses and 2 side effects of azathioprine

Uses

♣ Solid organ transplantation
♣ Acute glomerulonephritis
♣ Systemic lupus erythematosus.
♣ Rheumatoid arthritis, Crohn's disease, multiple sclerosis.

Adverse effects

♣ Bone marrow suppression
♣ Hepatic dysfunction

31. Mention side effects of mycophenolate mofetil

♣ Hypertension.
♣ Myelosuppression (less).

32. Enumerate mechanism of action of infliximab

a. Bind TNF-α, a proinflammatory cytokine.
b. b. Block TNF-α from binding to its receptors on inflammatory cell surfaces.
c. c. Suppress downstream release of inflammatory cytokines such as IL-1 and IL-6 and adhesion molecules involved in leukocyte activation and migration

33. Enumerate 3 uses of infliximab

♣ Rheumatoid arthritis
♣ Psoriatic arthritis.
♣ Inflammatory bowel disease
♣ Organ transplantation

34. Enumerate side effects of first generation H1 blocker

♣ Sedation but excitation and convulsions may occur in children after toxic doses.

♣ Atropine-like action

♣ Orthostatic hypotension (alpha blocking)

35. Mention uses of first generation H1 blocker

♣ Allergic conditions: e.g. allergic rhinitis and urticarial (H1).

♣ Motion sickness and vestibular disturbances (M1&H1)

♣ Carcinoid syndrome (serotonin

36. Compare between first and second generation H 1 blocker

	1st generation H1 blockers	2nd generation H1 blockers
Examples	▪ Diphenhydramine ▪ Dimenhydrinate ▪ Clemastine ▪ Cyclizine ▪ Cyproheptadine (serotonin)	▪ Loratadine ▪ Cetirizine ▪ Fexofenadine ▪ Ketotifen.
CNS effects	They can cross BBB (more lipophilic) →exert significant CNS actions	Cannot cross BBB (less lipophilic) →little CNS actions
Potency	Less	More
Duration of action	Shorter	Longer
Effects related to H1 blocking	▪ Relief of itching, pain and allergic response. ▪ ↓ capillary permeability and inflammatory edema induced by histamine ▪ ↓ bronchoconstriction, bronchial secretions, lacrimation, etc.	The same
Other effects	▪ Sedation ▪ Atropine-like actions (muscarinic) ▪ Antiemetic action ▪ Serotonin receptor blocking action ▪ α-receptor blocking action	Not present
Therapeutic uses	▪ Allergic conditions: ▪ e.g. allergic rhinitis and urticarial (H1). ▪ Motion sickness and vestibular disturbances (M1&H1) ▪ Carcinoid syndrome (serotonin)	▪ Allergic conditions: e.g. allergic rhinitis and urticarial (H1).
Adverse effects	▪ Sedation but excitation and convulsions may occur in children after toxic doses. ▪ Atropine-like action ▪ Orthostatic hypotension (alpha blocking)	▪ Prolonged QT interval (torsade de pointes) serious arrhythmia when given with other drugs that inhibit CYP450 and in patients with liver disease (↑level of the drug).