Hypothalamic & Pituitary Hormones

1. Anterior pituitary hormones and their hypothalamic regulators – targets of pharmacologic intervention.
2. Functions of growth hormone and insulin-like growth factor 1.
3. Recombinant form of GH
4. Clinical use of Somatropin in children.
5. Use of Somatropin for children with idiopathic short stature who are not GH deficient.
6. Use of GH analogs in adults.
7. Adverse effects of GH in children and adults.
8. Clinical use of recombinant human IGF-1 - Mecasermin
9. Main adverse effect of Mecasermin and its prevention
10. Combination of Mecasermin with insulin-like growth factor binding protein 3
11. Mechanism of action of Somatostatin and its synthetic analogs – Octreotide and Lanreotide
12. Adverse effects of Octreotide and Lanreotide.
13. Pegvisomant interaction with GH receptors
14. Clinical use of gonadotropins and their analogs
15. Gonadotropin preparations – Menotropins
16. FSH and its analogs
17. LH and its analogs – Human chorionic gonadotropin and Lutropin
18. Effects of GnRH on gonadotropin release during pulsatile use and steady dosing
19. Synthetic GnRH agonists – Leuprolide, Goserelin, Histrelin, Nafarelin and triptorelin.
20. Clinical use of GnRH agonists
21. Adverse effects of continuous treatments with GnRH agonist
22. GnRH antagonists – clinical use.
23. Adverse effects of GnRh antagonists and difference with adverse effects of GnRH agonists
24. Clinical use of D2 receptor agonists in hyperprolactinemia and acromegalia
25. Pharmacologic causes of hyperpolactinemia
26. Action of oxytocin and its clinical use.
27. Tocolytic action of oxytocin antagonist.
28. Functions of vasopressin receptors
29. Clinical use of V2 receptors agonist Desmopressin
30. Clinical use of vasopressin in patients with bleeding from esophageal varices or colon diverticula
31. Clinical use of vasopressin receptor antagonists – Conivaptan, Tolvaptan and Demeclocycline

Thyroid and Antithyroid drugs

1. Production and realize of thyroid hormones, thyroxine-binding protein
2. Receptors of thyroid hormones and their function.
3. Receptors of TSH
4. Mechanism of levothyroxine and liothyronine, difference and toxicity
5. Clinical use of levothyroxine and liothyronine
6. Distinguish exogenous hyperthyroidism from endogenous hyperthyroidism.
7. Mechanism of action of thioamides and its onset
8. Drugs acting on peripherial conversion of T4 to T3.

9. Clinical use of thioamides.
10. Use of thioamides during pregnancy and lactation
11. treatment of Graves opthalmopathy
12. Toxicities of thioamides.
13. Mechanism of action of iodide salts and iodine
14. "Escape" of the thyroid gland.
15. Clinical use of iodide salts
16. Adverse effects of iodide salts
17. Mechanism of action of radioactive iodine
18. Clinical use of radioactive iodine and contraindications
19. Mechanism of action of anion inhibitors and their adverse effects.
20. Use of beta-blockers for the treatment of thyrotoxicosis.
21. Use of propranolol in thyroid storm
22. Amiodarone action on thyroid gland and treatment of amiodarone induced hypo- and hyperthyroidism.
23. Action of iodinated radiocontrast media on conversion of T4 to T3.

Adrenocorticosteroids & Adrenocortical Antagonists

1. Major naturally occurring glucocorticosteroid and its actions.
2. Major pathways in adrenocortical hormone biosynthesis
3. Synthetic glucocorticoids, and differences between these agents and the naturally occurring hormone.
4. Actions of the naturally occurring mineralocorticoid and 1 synthetic agent in this subgroup.
5. Indications for the use of corticosteroids in adrenal and nonadrenal disorders.
6. Name 3 drugs that interfere with the action or synthesis of corticosteroids, and, for each, describe its mechanism of action.

Gonadal hormones and inhibitors

1. Mechanism of action of estrogen and progesterone
2. Bioavailability of estradiol and its synthetic analogs
3. Effects of estrogens on reproductive development and metabolism.
4. Clinical uses of estrogens
5. Toxicities in different age groups
6. Hepatic effects of estrogens and their prevention.
7. Toxicity of Diethylstilbestrol
8. Bioavailability and androgenic effects of different progestins.
9. Effects of progesterone
10. Clinical uses of progestins.
11. Effect of progestins on the risk of endometrial and breast cancers.
12. Toxicities of progestins.
13. Types of oral contraceptives

14. Types of postcoital contraceptives
15. Mechanism of action of the hormonal contraceptives
16. Clinical uses of the contraceptives
17. Thromboembolism related with the use of contraceptives.
18. Brest cancer and other toxicities of contraceptives.
19. Mechanism of action of selective estrogen receptor modulators
20. Targets of Tamoxifen action
21. Clinical use and toxicity of Tamoxifen and Toremifene.
22. Targets of Raloxifene action
23. Mechanism of action, clinical use and toxicities of Clomiphene
24. Mechanism of action of Fulvestrant
25. Mechanism of action and clinical use of nastrozole, letrozole, exemestane.
26. Mechanism of action, clinical use and toxicity of danazol
27. Clinical use and adverse effects of GnRH agonists and antagonists.
28. Mechanism of action and clinical use of mifepristone and ulipristal
29. Metabolism and mechanism of action of testosterone and methyltestosterone
30. Clinical use and adverse effects of testosterone and methyltestosterone
31. Anabolic actions of androgenic hormones
32. Different types of antiadrogens
33. Clinical use of androgen receptor inhibitors
34. Antiandrogenic action of ketoconazole and spironolactone
35. Mechanism of action and clinical use of Finasteride
36. Mechanism of action and clinical use of tamsulosin
37. Mechanism of action and clinical use of minoxidil
38. Clinical use of tocolytics
39. Mechanism of action, clinical use and adverse effects of copper intrauterine device
40. Treatment of androgen-induced hirsutism with combined contraceptives
41. Cytochrome P450 and hormonal contraceptives

Agents That Affect Bone Mineral Homeostasis

1. Major and minor endogenous regulators of bone mineral homeostasis.
2. Pathway and sites of formation of 1,25-dihydroxyvitamin D.
3. Clinical uses and effects of the major forms of vitamin D and its active metabolites.
4. Effects of PTH and vitamin D derivatives on the intestine, the kidney, and bone.
5. Agents used in the treatment of hypercalcemia and the agents used in the treatment of osteoporosis.
6. Effects of adrenal and gonadal steroids on bone structure and the actions of diuretics on serum calcium levels.

Pancreatic Hormones, Antidiabetic drugs and Glucagon

1. Effects of Insulin in liver, skeletal muscle and adipose tissue
2. The available insulin preparations –onset, peak and duration of action
3. Routs of administration of insulins
4. Modes of insulin therapy
5. Complications of insulin use
6. Mechanism of action of insulin secretagogues
7. Chemical classes of insulin secretagogues
8. Adverse effects of secrettagogues
9. Mechanism of action and clinical use of metformin
10. Adverse effects of insulin
11. Mechanism of action and effects of thiazolidinediones
12. Toxicities of thiazolidinediones
13. Analog of glucagon-like peptide-1 –mechanism of action, clinical use and toxicity
14. Mechanism of action, clinical use and toxicity of sitagliptin
15. Mechanism of action, clinical use and toxicity of alpha-glucosidase inhibitors
16. Mechanism of action, clinical use and toxicity of pramlintide
17. mechanism of action, clinical use and toxicity of sodium-glucose transporter 2
18. Therapy of type 1 and type 2 diabetes
19. mechanism of action and clinical use of glucagon

Drugs Used in Gastrointestinal Disorders

1. Groups of drugs with the ability to reduce intragastic acidity
2. Mechanism of action of antacids and their application for peptic ulcer disease.
3. Possible toxicity of different antacids
4. Effect of different antacids on stool consistency and their absorption
5. Mechanism of action of H2 antagonists, pattern of inhibition of stomach acid production (duration, nocturnal or meal-stimulated acidity).
6. Main clinical uses, toxicity of different representatives of H2 antagonists and drug-to-drug interactions.
7. Mechanism and duration of action of Proton Pump inhibitors and recommendations for administration.
8. Clinical use of PPIs, comparison with H2 antagonists.
9. Toxicity related to PPI use, potential problem due to hypergastrinemia.
10. Chemistry and mechanism of action of Sucralfate; needed environment for action.
11. Mechanism of action and toxicities of Misoprostol and its application for prevention of peptic ulcer disease.
12. Mechanism of action and toxicities of Colloidal bismuth, its different effects.
13. Antibiotics recommended for treatment of *H.pylori* induced peptic ulcer.
14. Drugs with promoting effect on upper gastrointestinal motility (prokinetics), groups, mechanisms of action, effects on GI tract and lower esophageal sphincter.
15. Prokinetics - D2 receptor antagonists – permeability through blood-brain barrier, toxicity.

16. Classification of laxatives in accordance with mechanism of action, adverse effects.
17. Use of Lactulose in hepatic encephalopathy
18. Antidiarrheal agents - opioids and derivatives of opioids, permeation in blood-brain barrier,
19. Combination of diphenoxilate with antimuscarinics.
20. Mechanism of action of Kaolin, its interaction with other drugs, clinical use and contraindications.
21. Octreotide, clinical use and adverse effects.
22. Groups of drugs used for Irritable Bowel Syndrome.
23. Mechanism of action of Alosetron and adverse effects.
24. Lubipristone and Linaclotide, mechanism of action on type 2 chloride channels.
25. Groups and mechanisms of action of antiemetic drugs, use in chemotherapy induced vomiting.
26. Drugs used for Inflammatory Bowel Disease (IBD) - 5-aminosalicilic acid (Mesalamine) containing drugs and their mechanism of action.
27. Sulfasalazine, mechanism of action, clinical use and adverse effects.
28. Other groups of drugs used for Inflammatory Bowel Disease.
29. Mechanism of action of Orlistat, its clinical use and adverse effects.
30. Drugs used for replacement of pancreatic enzymes and their interaction with acid.
31. Clinical use of Ursodiol.

Agents Used in Dyslipidemia

- Describe pathogenesis of hyperlipoproteinemia
- Understand the general treatment strategies for hyperlipoproteinemia
- Understand the metabolism of lipoprtoteins (Figure 35-1)
- Describe HMG-CoA reductase inhibitors

_ Mechanism of action
_ Effects
_ Clinical use
_ Toxicity

- Describe bile acid-binding resins

_ Mechanism of action
_ Effects
_ Clinical use
_ Toxicity

- Describe ezetimibe

_ Mechanism of action
_ Effects
_ Clinical use
_ Toxicity

- Describe niacin

_ Mechanism of action
_ Effects
_ Clinical use
_ Toxicity

- Describe fibric acid derivatives

_ Mechanism of action
_ Effects

_ Clinical use
_ Toxicity

- Understand the risks and benefits of combination therapy
- Know the mechanisms of action of lomitapide and mipomersen
- Describe evolocumab and alirocumab _ mechanism of action and effects (listed in First Aid)