Pharmacology Examination Topics

1st semester

1. Pharmacodynamic principles. Receptors and subtypes
   - General description of parasympathetic nervous system from pharmacological point of view (neurotransmitters and receptors)
   - Antihypertensive mode of action of thiazide diuretics and the side effects, osmotic diuretics
2. Dose-response relationships. Efficacy and potency
   - Directly acting parasympathomimetics
   - Calcium channel blockers
3. Graded and quantal dose-response relationships. Therapeutic index, therapeutic window
   - Parasympatholytics
   - Centrally acting sympathoplegic drugs
4. Agonists and antagonists. Antagonism on the receptor level
   - Sympathomimetics
   - Pharmacology of renin/angiotensin system
5. Antagonism. Non-receptorial antagonism
   - Non-selective α-adrenoceptor blockers
   - General description of antiarrhythmic drugs. Vaughan Williams classification
6. Control of receptor expression. Receptor diseases and receptors and disease
   - β-adrenoceptor blockers
   - Treatment of myocardial ischemia especially the treatment of angina pectoris
7. Desensitization, tachyphylaxys and tolerance
   - Indirectly acting parasympathomimetics
   - Drugs used in the treatment of hyperlipidemias
8. The movement of drugs through biological membranes
   - Structure-activity relationships demonstrated among sympathomimetics
   - Drugs used for the treatment of congestive heart failure
9. Distribution of drugs in the body: the apparent volume of distribution (V_d)
   - General description of sympathetic nervous system from pharmacological point of view (neurotransmitters and receptors)
   - Characterization of quinidine, lidocaine, and amiodarone
10. Elimination of drugs: the half-life ($T_{1/2}$)
    - Pharmacological tools to influence the sympathetic neurotransmission
    - Expectorants and antitussives
11. The clearance
    - Selective α-adrenoceptor blockers
    - Pharmacology of the liver and the gall bladder
12. Plasma concentrations after repeated administration: loading dose and maintenance dose
    - Metabolism of chatecholamines and pharmacological modulation
    - Pharmacological treatment of bronchial asthma
13. Absorption of drugs and ion trap
    - Comparison of elimination of acetylcholine (Ach) and norepinephrine/noradrenaline from the synaptic cleft and the possibilities of pharmacological modulation
    - Therapeutic importance of diuretics, mode of action and classification. Antialdosterone compounds and other potassium-sparing diuretics

14. Bioavailability. AUC
    Compare the effects of norepinephrine/noradrenaline, epinephrine/adrenaline and isoprenaline
    Inhibitors of carboanhydrase enzyme, thiazides and other sulfonamide type diuretics, high-ceiling diuretics (loop diuretics) and antidiuretics
15. First pass effect
    Synthesis, storage, release and elimination of acetylcholine (Ach). Demonstration of Dale's experiment
    Agents used in anemias
16. Drug elimination: I. Biotransformation
    Non-adrenergic, non-cholinergic (NANC) transmission
    Drugs used in coagulation disorders
17. Factors influencing the drug elimination
    Uptake mechanisms, substrates and inhibitors
    Drugs used in acid-peptic disease
18. Drug elimination: II. Excretion
    α2 sympathomimetics and the concept of "false transmitter"
    Laxatives, antidiarrheal drugs. Drugs in the treatment of chronic inflammatory bowel disease, antiobesity drugs
19. Factors influencing the drug effect. Preclinical phase of drug development
    Pharmacology of cardiac glycosides
    Drugs promoting gastrointestinal motility. Emetics and antiemetic drugs
20. Drug interactions. Biologicals (biological therapy), special considerations with respect to their development.
    Positive inotropic substances except cardiac glycosides
    Pharmacotherapeutic approach to exocrine pancreatic diseases
21. Clinical phase of drug development.
    Adrenergic neuron blockers and reserpine. Antihypertensive mode of action of β-blockers
    Botanical/herbal remedies