IV TH CONCLUDING
DRUGS ACTING ON THE RESPIRATORY, CARDIOVASCULAR AND DIGESTIVE SYSTEMS. DIURETICS. ANTIGOUT DRUGS. DRUGS USED IN NEPHROLITHIASIS AND ACID-BASE BALANCE DISORDERS. CEREBRAL AND PERIPHERAL VASODILATOR DRUGS.
DRUGS USED IN MIGRAINE. VENOTROPIC DRUGS.

A. Actuality. The medication of diseases of the internal organs occupies a special place in the practical activity of the doctor. In most cases, the treatment of pathologies of the respiratory, cardiovascular, digestive and urinary systems is long-term and requires drugs from various pharmacological groups (especially in elderly patients). All this requires a deep study of the drugs in the respective groups.

B. The purpose of the training consists in consolidating students' knowledge about the drugs used in the treatment of respiratory, cardiovascular, digestive and urinary system diseases, systematizing the material and forming the general concept of selecting drugs in the treatment of diseases and corresponding pathological conditions.

C. Learning objectives:

1) The student **must know:** the pharmacological characteristics of the groups of drugs (pharmacodynamics and pharmacokinetics) used in diseases of internal organs, the general principles of treatment of diseases of internal organs, emergency medical assistance.

2) The student **must be able to:** prescribe the mandatory drugs, indicate drugs in various diseases and emergency situations, apply the accumulated knowledge to solving situational problems.

D. Self-training questions:

1. Classification of antitussive drugs. Central acting antitussives: classification, mechanism of action and indications of opioid and non-opioid antitussives.
2. Peripherally acting and mixed antitussives: mechanisms of action and indications.
3. Classification of expectorants. Secretion enhancers: classification, mechanism of action, indications.
4. Mucolytics: classification, mechanisms of action, indications and adverse reactions of thiol derivatives, vasigin and proteolytic enzymes.
5. Classification of drugs used in broncho-obstructive diseases:

   (a) Adrenomimetics: classification. Beta-2-adrenomimetics:

   classification by duration of action, mechanism of action, effects, indications, adverse reactions.

   (b) M-cholinoblockers: classification by duration of action, effects, indications, adverse reactions.

   c) Corticosteroids: classification by route of administration, effects, indications. Adverse reactions of inhaled glucocorticoids.

   d) Methylxanthines as bronchodilators: classification, mechanism of action, effects, indications, adverse reactions;

   e) Mast cell stabilizers and leukotriene antagonists: classification, mechanism of action, effects, indications, adverse reactions.
6. Classification of drugs used in heart failure.
7. Cardiac glycosides: classification by solubility and duration of action, mechanism of action, influence on cardiac parameters (inotropic-positive, batmotropic-positive, dromotropic-negative, chronotropic-negative, tonotropic-positive action) and mechanisms of these phenomena. Electrocardiography (ECG) changes when using cardiac glycosides in therapeutic doses.
8. Influence of cardiac glycosides on systemic and regional hemodynamics, CNS, kidney, respiratory system and gastrointestinal tract.
9. Indications of cardiac glycosides. Pharmacokinetics. Dosing principles.
10. Poisoning with cardiac glycosides. Clinical picture and treatment.

11. Non-glycosidic (synthetic, non-steroidal) cardiotonics. Classification, mechanisms of action, effects, indications, adverse reactions.
12. Cardiostimulators (α,β- and β-adrenomimetics, dopaminomimetics): classification, mechanisms of action, effects, indications, adverse reactions.
13. Drugs that increase the sensitivity of contractile proteins to calcium ions. Mechanisms of action, effects, indications, contraindications and adverse reactions.
14. Classification of antihypertensives (neurotropic drugs, musculotropic drugs, drugs regulating hydrosaline metabolism, renin-angiotensin inhibitors).
15. Neurotropic antihypertensive drugs with central action: classification, mechanisms of action, pharmacological effects, indications, adverse reactions.
16. Neurotropic antihypertensive drugs with peripheral action: classification.

- Ganglioplegics: mechanism of action, antihypertensive effect, indications.
- Sympatholytics: mechanisms of action, antihypertensive effect, indications.
- α-adrenoblockers: classification, mechanism of action, effects, indications, reactions adverse.
- β-adrenoblockers: classification, mechanism of action, effects, indications, adverse reactions.
- αβ-adrenoblockers: mechanism of action, effects, indications, adverse reactions.

17. Musculotropic antihypertensive drugs: classification.
a) Potassium channel activators: mechanism of action, effects, indications, adverse reactions.
b) Myotropic antihypertensives with direct action: classification. Arteriodilators: mechanism of action, effects.
c) Nitric oxide donors: mechanism of action, effects, indications, adverse reactions.
d) Calcium channel blockers: mechanism of action, effects, indications, adverse reactions.
18. Antihypertensive drugs with influence on the renin-angiotensin-aldosterone system: classification.
a) Converting enzyme inhibitors: mechanism of action, effects, indications, adverse reactions.
b) Angiotensin receptor blockers: mechanism of action, effects, indications, adverse reactions.
c) Renin antagonists: mechanism of action, effects, indications, adverse reactions.
19. Groups and drugs used in hypertensive crises and hypertensive emergencies. Characteristic.
20. Classification of antihypotensive (hypertensive) drugs according to the mechanism of action.
21. Vasoconstrictor antihypotensives: classification.
a) alpha and alpha, beta-adrenomimetics: mechanism of action, antihypotensive effect, indications, adverse reactions.
b) isothiourea compounds: mechanism of action, effects, indications, adverse reactions.
c) vasoactive peptides: mechanisms of action, effects, indications, adverse reactions.
d) CNS stimulants (methylxanthines): mechanism of action, influence on the heart, vessels, blood pressure, indications, adverse reactions.
22. Antihypotensive drugs with influence on the heart: classification.
a) dopaminomimetics: effects, indications, adverse reactions.
b) beta-1-adrenomimetics: effects, indications, adverse reactions.
23. Antihypotensives with permissive action: the particularities of the antihypotensive action of corticosteroids.
24. Classification of antianginal drugs:
a) Drugs that reduce the myocardial need for oxygen and increase oxygen supply: classification:
- Organic nitrates. Mechanism of action at molecular and systemic level, pharmacological effects. The indications. Adverse reactions. Pharmacokinetics.
- The sydnonimines: the mechanism of action at the molecular and systemic level, the pharmacodynamic advantages, the indications, the adverse reactions.

- Calcium channel blockers: classification, mechanism of action at molecular and systemic level, pharmacological effects. The indications. Adverse reactions.

b) Second-line antianginal drugs: antianginal action and indications of ivabradin, ranolazine, nicorandil.

c) Beta-adrenoblockers as antianginal: classification, antianginal effect. The indications. Adverse reactions.

25. Cardioprotective drugs: mechanism of action, antianginal effect, indications.

26. Groups of drugs used for the treatment of acute myocardial infarction. The principles of their action.

27. Classification of antiarrhythmic drugs.

28. Drugs that block ion channels of cardiomyocytes, classification:

a) Sodium channel blockers (membrane stabilizers): mechanism of action.

- Class IA (quinidine group): antiarrhythmic effect, influence on conductivity, contractility, excitability, automatism. Indications, adverse reactions;
- Class IB (lidocaine group): antiarrhythmic effect, indications, adverse reactions, pharmacokinetics;
- Class IC (flecainide group): antiarrhythmic effect, indications, side effects, pharmacokinetics.

b) Calcium channel blockers (class II): antiarrhythmic effect, indications, adverse reactions.

c) Potassium channel blockers (drugs that mainly increase the effective refractory period - class III). Amiodarone: antiarrhythmic and antianginal effect, indications, side effects, pharmacokinetics. The particularities of sotalol and bretylium tosylate.

29. Beta-adrenoblockers: classification, antiarrhythmic effect, influence on the heart, indications.

30. Classification of drugs used in cerebral and peripheral circulation disorders.

31. Classification of antimigraine drugs. Drugs used in the suppression of migraine attacks: mechanisms of action. Groups of drugs used for migraine prophylaxis.

32. Classification of angioprotectors.

33. Classification of venotropic drugs.

34. Classification of diuretics according to the mechanism of action, place of action in the nephron, onset of action and duration of action.

35. Carbonic anhydrase inhibitors: mechanism of action, pharmacological effects, indications, adverse reactions.

36. Loop diuretics: mechanism of action, pharmacological effects, indications, adverse reactions.

37. Thiazide and thiazide-like diuretics: mechanism of action, pharmacological effects, indications, adverse reactions.

38. Competitive and non-competitive antagonists of aldosterone: mechanisms of action, pharmacological effects, indications, adverse reactions.

39. Osmotic diuretics: mechanism of action, pharmacological effects, indications, contraindications, adverse reactions.

40. Anti-gout drugs. Classification:

a) Medicines with specific action used in gout crisis: mechanism of action, pharmacological effects, indications, adverse reactions.

b) Medicines used in the prophylaxis (treatment) of gout. Mechanism of action, pharmacological effects, indications and adverse reactions of uricoinhibitors, uricosurics and uricolytics.

41. Classification of drugs used in urolithiasis.

42. Classification of drugs used in hydro-electrolytic balance disorders. Crystalloid solutions used in isotonic, hypotonic and hypertonic dehydrations: pharmacological properties, indications, adverse reactions.

43. Classification of drugs used in acid-base balance disorders: mechanism of action, indications.

44. Classification of plasma volume expanders.

45. Dextrans as plasma volume expanders: classification, pharmacological properties, indications, adverse reactions.
46. Hydroxyethylstarch drugs as plasma volume expanders: pharmacological properties, indications, adverse reactions.
47. Drugs of polypeptide polymers as plasma volume expanders: pharmacological properties, indications, adverse reactions.
48. Blood preparations as plasma volume expanders: pharmacological properties, indications, adverse reactions.
49. Replacement therapy in pancreas hypofunction: classification, mechanism of action, effects, indications, adverse reactions.
50. Classification of drugs used in gastric hypersecretion.

a) M-cholinoblockers as antiulcers: classification, mechanism of action, effects, indications, adverse reactions;

b) H2-histamine blockers as antiulcers: mechanism of action, effects, indications, adverse reactions;

c) Proton pump inhibitors as antiulcers: mechanism of action, effects, indications, adverse reactions.

51. Antacid drugs: classification, mechanism of action, indications, adverse reactions.
52. Gastroprotectors and cytoprotectors: classification, mechanism of action, effects and indications of sucralfate, bismuth preparations, prostaglandin analogues, herbal and synthetic drugs, vitamins.
53. Drugs that inhibit the exocrine function of the pancreas: mechanism of action, effects, indications.
54. Prokinetic drugs: classification, mechanisms of action, effects, indications, adverse reactions.

a) Laxatives and purgatives: classification. Mechanism of action, effects, indications and adverse reactions of bulk and stool softener laxatives, osmotic and irritant(stimulant) purgatives.

b) Antiflatulences: classification. Mechanisms of action and indications of adsorbent drugs, surfactants and vegetable carminatives.

55. Classification of drugs that inhibit the motility of the digestive tube:

a) Antiemetics: classification according to group membership. Mechanisms of action and indications of neuroleptics, M-cholinoblockers, H1-histaminoblockers, dopaminergic and serotoninergic antagonists.

b) Antidiarrhoeas: classification. Mechanisms of action, effects and indications of opioid, astringent, adsorbent and protective drugs.

56. Hepatoprotective drugs: classification by origin; mechanisms of action, effects and indications. Hepatoprotectors of entomological origin.
57. Drugs with influence on the formation, secretion and excretion of bile: classification.

a) Bile secretion stimulants: classification, mechanisms of action, effects, indications

b) Cholecystokinetics: classification, mechanisms of action, effects, indications

c) Cholelitholytics: mechanism of action, effects and indications.

58. Classification of smooth muscle antispasmodics (spasmolytics).

a) Neurotropic spasmolytics: mechanism of action, indications.

b) Myotropic spasmolytics: classification, mechanism of action, indications.

c) Combined spasmolytics: classification, mechanism of action, indications.

E. Exercises for the practical part:

1) To prescribe the following drugs in all forms of delivery:

Niketamide. Epinephrine. Ipratropium bromide. Aminophylline. Salbutamol. Disodium cromoglycate. Codeine. Ketotifen. Butamirate. Prenoxdiazine. Bromhexine. Acetylcysteine. Dextromethorphan. Strophanthine. Digitoxin. Digoxin. Corglycon. Amrinone. Levosimendan. Dobutamine. Nitroglycerin. Isosorbide dinitrate. Molsidomine. Nifedipine. Dipyridamole. Vinpocetine. Pentoxifylline. Xanthinol nicotinate. Nicergoline. Cinnarizine. Sumatriptan. Ravimig. Piracetam. Troxerutin. Quinidine. Procainamide. Lidocaine. Mexiletine. Flecainide.

Verapamil. Amiodarone. Sotalol. Metoprolol. Propranolol. Clonidine. Methyldopa. Moxonidine. Azamethonium. Prazosin. Carvedilol. Nebivolol. Labetalol. Hydralazine. Sodium nitroprusside. Captopril. Enalapril. Losartan. Norepinephrine. Phenylephrine. Isoturon. Dopamine. Caffeine sodium benzoate. Mannitol. Furosemide. Torasemide. Hydrochlorothiazide. Indapamide. Spironolactone. Triamterene. Eplerenone. Colchicine. Allopurinol. Cistenal. Ammonium chloride. Sodium bicarbonate. Dextran-40. Polyvinylpyrrolidone. Potassium chloride. Calcium chloride. Sodium chloride. Rehydron. Hydroxyethyl starch. Albumin. Gelatin succinylate. Pancreatin. Creon. Famotidine. Omeprazole. Almagel. Sucralfate. Colloidal bismuth subcitrate. Regesan. Aprotinin. Metoclopramide. Simethicone. Magnesium sulfate. Bisacodyl. Picosulfate. Thiethylperazine. Ondansetron. Lactulose. Macrogol. Loperamide. Enterol. Bactisubtil. Essential. Ademetionine. Silymarin. Ursodeoxycholic acid. Colossas. Papaverine hydrochloride. Drotaverine. Atropine sulfate. Platyphylline hydro tartrate. Baralgin.

2) List the groups and drugs used in (for):

Newborn asphyxia, dry cough in acute respiratory infections, whooping cough, cough in inoperable cancer, secretion enhancers in acute respiratory infections; secretion enhancers in broncho-obstructive diseases; mucolytic in broncho-obstructive diseases; mucolytics in bronchopneumonia; cystic fibrosis; bronchodilators in broncho-obstructive diseases; asthma attacks; prophylaxis of bronchospasm when inhaling drugs; status asthmatic; paracetamol poisoning; antifoam drugs in pulmonary edema; respiratory distress syndrome, decompensated chronic heart failure; chronic congestive heart failure; poisoning with cardiac glycosides; cardiostimulants in acute myocardial infarction; cardiogenic shock; cardiac arrest, treatment of angina pectoris attacks; prophylaxis of angina pectoris attacks; 1st line medicines that are used in treatment of angina pectoris; 2nd line medicines that are used in treatment of angina pectoris; drugs that reduce oxygen demand in angina pectoris; cardioprotective drugs in angina pectoris; pain relief in acute myocardial infarction; fear relief in acute myocardial infarction; thrombosis prophylaxis in acute myocardial infarction; membrane stabilizers in supraventricular and ventricular arrhythmias; ventricular tachyarrhythmias of sympatho-adrenal (neurogenic) type; tachysystolic atrial flutter and fibrillation; ventricular arrhythmias; digital arrhythmias (caused by overdose of cardiac glycosides); ventricular arrhythmias in myocardial infarction; rebellious supraventricular and ventricular arrhythmias to other antiarrhythmics; ventricular arrhythmias refractory to other antiarrhythmics; sinus bradycardia; atrio-ventricular block; cardiac arrest, migraine attacks, migraine prophylaxis; vestibulo-cochlear disorders; chronic cerebral circulatory insufficiency; Raynaud's syndrome; obliterant endarteritis; Chronic venous insufficiency; trophic ulcers of the lower limbs; hypertensive crisis, hypertensive emergencies; pheochromocytoma treatment; neurotropic drugs with central action in arterial hypertension; peripheral neurotropic drugs in arterial hypertension; musculotropic drugs in hypertension; inhibitors of the renin-angiotensin-aldosterone system in arterial hypertension; converting enzyme inhibitors in arterial hypertension, arterial hypertension with arrhythmias, arterial hypertension with hyperaldosteronism, arterial hypertension with hyperreninemia, vasoconstrictors with central action in arterial hypotension; peripheral vasoconstrictors in arterial hypotension; cardiostimulators in arterial hypotension; cardiogenic shock with arterial hypotension, arterial hypotension resistant to sympathomimetics, orthostatic hypotension caused by ganglioblockers and alpha-adrenoblockers; hypovolemic shock; chronic arterial hypotension; cerebral edema; pulmonary edema of toxic origin; diuretics in acute renal failure; diuretics in chronic renal failure; forced diuresis; diuretics in hypertension; diuretics in glaucoma; diuretics in acute heart failure; diuretics in chronic congestive heart failure; attacks of gout; prophylaxis (treatment) of gout; treatment of acidosis; treatment of alkalosis; isotonic dehydration treatment; treatment of hypotonic dehydration; treatment of hypertonic dehydration; detoxification of the body in peritonitis; detoxification of the body in food poisoning; hypokalemia; hypocalcemia; antisecretory drugs in reflux esophagitis; antisecretory drugs in Zollinger-Ellison syndrome; antisecretory in gastric and duodenal ulcers; antacids in duodenal ulcer; inhibitor of proteolytic enzymes in acute pancreatitis; replacement therapy in chronic pancreatitis; enzymatic drugs in

food abuse; gastroprotective in gastric and duodenal ulcers; gastric hypomotility; postoperative flatulence; flatulence and intestinal distension; flatulence in disorders of intestinal digestion; flatulence in functional disorders of the digestive tract; antiflatulences before the radiological and ultrasonographic examination of the digestive tube; laxatives in chronic functional constipation; laxatives in hepatic encephalopathy; purgatives for preparation for the radiological and endoscopic examination of the digestive tube; purgatives for preparation for surgery; purgatives in drug or food poisoning; drug-induced vomiting; vomiting in motion sickness; antitumor-induced vomiting; postoperative vomiting; vomiting of pregnant women; vomiting in diseases of the digestive tract; acute non-specific diarrhoea, drug-induced toxic hepatitis; chronic diseases of the biliary tract; cholelithiasis; biliary colic; intestinal colic.