


<p> ОҢТҮСТІК ҚАЗАҚСТАН MEDISINA AKADEMIASY «Оңтүстік Қазақстан медицина академиясы» АҚ </p>		<p>  SOUTH KAZAKHSTAN MEDICAL ACADEMY АО «Южно-Казахстанская медицинская академия» </p>
Department of Pharmacology, Pharmacotherapy and Clinical Pharmacology		044-41
Methodological recommendations for practical exercises		

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Discipline Clinical pharmacology


Code CFh 5301

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Amount of training hours/credits 120/4

Course and semester of study 5/10

Practical exercises 30

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<p>Department of Pharmacology, Pharmacotherapy and Clinical Pharmacology</p>		044-41
<p>Methodological recommendations for practical exercises</p>		

2023-2024


Methodological recommendations for practical classes were developed in accordance with the syllabus and discussed at a department meeting

Protocol №.10 from 15.05 2023 y.

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Practical lesson No. 1: Introduction. Clinical pharmacology of respiratory diseases. Rational pharmacotherapy of pneumonia.

2.Purpose: To form in students an idea of the general laws underlying the pharmacological action of medicinal substances on the body. Give to the future doctors knowledge of general patterns pharmacokinetic parameters and their clinical significance in the treatment of patients with pneumonia. The importance of pharmacokinetics for choosing drugs and determining their dosage regimen: route of administration, absorption, bioavailability, binding to proteins, volume of distribution, metabolism, half-life, clearance, routes and rate of elimination. Features of drug pharmacokinetics in different groups of patients.

3.Learning objectives:

- teach the student clinical and pharmacological approach to the informed choice of drugs, dosage regimen, assessment of the effectiveness and safety of drug use.
- teach the use of medicines for pneumonia and bronchitis.
- teach general principles of treatment for the pathological and physiological profile of the patient using international guidelines and clinical protocols.
- Selection of the optimal pharmacotherapy regimen, taking into account individual physiological characteristics, concomitant diseases and drug interactions.
- Use of medications for multimorbidity.

4.Main questions of the topic:

1. Basic structure and functions of the respiratory system.
2. Medicines affecting the functions of the respiratory system. Classification.
3. Drug and non-drug treatment of chronic bronchitis and pneumonia.
4. The main mechanisms of action of antitussives and expectorants.
5. Use of analeptics, glucocorticoids and adrenomimetic drugs.
6. Drug interactions: pharmaceutical, pharmacokinetic, pharmacodynamic.
7. Treatment of pneumonia with concomitant diseases: heart failure, bronchial asthma and other diseases.
8. Factors influencing the pharmacokinetics and pharmacodynamics of fetal drugs.
9. Features of treatment during pregnancy and newborns.


5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups, discussions.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems.

7. Literature: Appendix 1

8. Security questions:

1. Structures of the respiratory system.
2. Mucociliary clearance.
3. Syndromes with pneumonia and bronchitis.
4. Drugs affecting the functions of the respiratory system. Classification.
5. Principles for choosing drugs for the treatment of cough syndrome.
6. Principles of antibacterial therapy of pneumonia and bronchitis.

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7. Features of antibacterial therapy for lower respiratory tract diseases in pregnant women and children.
8. Drugs used for bronchial obstruction syndrome (bronchodilators). Classification of bronchodilators. Substances that stimulate B2 adrenergic receptors. M-anticholinergics. Bronchodilators with myotropic action. Leukotriene receptor blockers.
9. Bronchodilators of myotropic action. The mechanism of bronchodilator action of aminophylline and theophylline. Indications for use. Side effects.
10. Leukotriene receptor blockers (zafirlukast, montelukast). Mechanism of action. Indications for use. Side effects.
11. Drugs with anti-inflammatory and bronchodilator activity. Steroid anti-inflammatory drugs (hydrocortisone, dexamethasone, triamcinolone, beclomethasone). Antiallergic drugs. Mechanism of action. Indications for use. Side effects.
12. Drugs that eliminate swelling of the mucous membrane of the lungs. Opioid analgesics (morphine, fentanyl, talamonol). Ganglion blocking agents (hygronium, pentamine, benzohexonium). Vasodilators with myotropic action (Sodium nitroprusside). Alpha blockers (phentolamine).
13. Drug of choice for cough syndrome.
14. Evaluation of the effectiveness of antibacterial therapy.

Practical lesson No. 2 “Clinical pharmacology of respiratory diseases. Rational pharmacotherapy of COPD, bronchial asthma.”


1.Purpose: To provide insight and the opportunity to gain knowledge about:

- mechanisms of action and features of the use of drugs that affect the function of the respiratory system and are used for bronchial asthma, COPD;
- indications and contraindications for the use of drugs that affect the function of the respiratory system and are used for bronchial asthma, COPD;
- side and toxic effects of drugs affecting the function of the respiratory system and used in bronchial asthma, COPD;


2.Learning objectives:

- Learn to use medications that affect the function of the respiratory system.
- Treatment algorithm for emergency clinical symptoms of bronchial asthma COPD.
- The mechanism of action of drugs in combination with other drugs.

3.Main questions of the topic:

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1. Definition of bronchial asthma and COPD. Classification.
2. Pathogenesis of bronchial asthma and COPD.
3. Classification of drugs affecting the function of the respiratory system.
4. Analeptics (bemegride, cordiamine, camphor). Classification. Indications for use. Side effect.
5. Breathing stimulants. Classification. Drugs that directly activate the respiratory center (bemegride, caffeine, etimizol). Drugs that reflexively stimulate breathing (cytiton, lobeline hydrochloride). Drugs of mixed action (cordiamin, carbonic acid). Mechanisms of action, indications for use, side effects.
6. Antitussives: classification of drugs. Centrally acting agents (codeine, ethylmorphine hydrochloride, glaucine hydrochloride, tusuprex). Peripheral acting agents (libexin). Mechanisms of action. Side effects. Features of use in children.
7. Expectorants (ipecac preparations, thermopsis preparations, acetylcysteine, ambroxol, bromhexine, potassium iodide, sodium bicarbonate, marshmallow root preparations, licorice). Classification. Mechanism of action, indications, side effects.
8. The principle of choosing drugs for the treatment of cough syndrome.
9. Principles of treatment of exacerbations of chronic bronchitis.
10. Principles of antibacterial therapy for pneumonia and lung abscess.
11. Features of antibacterial therapy for diseases of the lower respiratory tract in pregnant women and children.
12. Medicines used for bronchial obstruction syndrome (bronchodilators). Classification of bronchodilators. Substances that stimulate B2 adrenergic receptors. M-anticholinergics. Bronchodilators with myotropic action. Leukotriene receptor blockers.
13. Substances that stimulate B2-adrenergic receptors (salbutamol, fenoterol, terbutaline, isadrine, orciprenaline sulfate, adrenaline hydrochloride.). M-anticholinergics (atropine sulfate, metacin, ipratropium bromide). Characteristics of drugs, mechanism of bronchodilator action. Indications for use.
14. Bronchodilators of myotropic action. The mechanism of bronchodilator action of aminophylline and theophylline. Indications for use, side effects.
15. Leukotriene receptor blockers (zafirlukast, montelukast). Mechanism of action. Indications for use. Side effects.
16. Drugs with anti-inflammatory and bronchodilator activity. Steroid anti-inflammatory drugs (hydrocortisone, dexamethasone, triamcinolone, beclomethasone). Antiallergic drugs (cromolyn sodium, ketotifen). Mechanism of action. Indications for use. Characteristics of drugs.
17. Drugs that eliminate swelling of the bronchial mucosa (mast cell membrane stabilizers, glucocorticoids). Features of action and application. Side effects.
18. Medicines that eliminate swelling of the mucous membrane of the lungs. Opioid analgesics (morphine, fentanyl, thalamonal). Ganglion blocking agents (hygronium, pentamine, benzohexonium). Myotropic vasodilators (Sodium nitroprusside). Alpha blockers (phentolamine). Defoamers (ethanol).
19. Antibacterial drugs used for bronchopulmonary diseases (broad-spectrum penicillins, inhibitor-protected penicillins, cephalosporins, second-generation aminoglycosides, modern macrolides, aztreonam, fluoroquinolones).
20. Evaluation of the effectiveness of antibacterial therapy. Measures to increase the effectiveness of antibiotic therapy and reduce the risk of developing resistance of bronchopathogens.

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5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: Case study. Discussion of a clinical case (CbD – Case based Discussion). Small group work

6. Types of control to assess the level of achievement of the final RO of the discipline: Oral survey. Solving test tasks and situational problems.

7. Literature: Appendix 1

8. Security questions:

1. Classification of antitussive drugs?
2. Concept and classification of bronchodilators
3. The mechanism of action of bronchodilators. Comparative assessment of modern bronchodilators and their use at different stages of respiratory diseases.
4. The use of anti-inflammatory drugs, glucocorticosteroids, membrane stabilizing agents (sodium cromoglycolate, nedocromil sodium, ketotifen).

Practical lesson No. 3 “Clinical pharmacology of diseases of the cardiovascular system. Rational pharmacotherapy of acute coronary syndrome and arterial hypertension

2. Purpose: Know the main indications for prescribing medications for cardiovascular diseases.


- Basic mechanisms of action and features of the use of drugs used for ACS (antiplatelet agents, antianginal agents, nitrates, lipid-lowering drugs).
- About indications and contraindications for the use of drugs used for ACS.
- Draw students' attention to the features of properties individual drugs and give their comparative characteristics.
- about the mechanisms of action and features of the use of antihypertensive drugs.
- about indications and contraindications for the use of antihypertensive drugs.
- about the side and toxic effects of antihypertensive drugs.
- teach how to write prescriptions for basic antihypertensive drugs.

3. Learning objectives:

- consider the issues of pharmacodynamics and pharmacokinetics of antiplatelet drugs.
- substantiate the main pharmacological effects of antihypertensive and antianginal drugs.
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.
- be able to choose treatment tactics when providing emergency care for ACS.
- consider issues of pharmacodynamics and pharmacokinetics of antihypertensive drugs.
- justify the main pharmacological effects of antihypertensive drugs.
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics

4. Main questions of the topic:

1. Pathophysiology of acute coronary syndrome (ACS). Principled approaches to control the imbalance between oxygen demand and delivery to the heart. Classification of antianginal drugs.


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2. Preparations of the nitrate group. Mechanism of antianginal action. Long-acting nitroglycerin preparations (sustak, nitrong, nitrogranulong, injection and transdermal dosage forms).
3. Long-acting organic nitrates: isosorbide dinitrate and mononitrate. Features of their pharmacodynamics and pharmacokinetics.
4. Calcium antagonist drugs: dihydropyridines, verapamil, diltiazem. Mechanism of action. Interaction with voltage-gated L-type calcium channels. Effects on vascular smooth muscle. Effect on heart function.
5. Drugs that block B receptors (B blockers). Effect on heart rate and strength, coronary blood flow and systemic hemodynamics. Changes in myocardial oxygen demand under the influence of B-blockers.
6. Classification of B-blockers. Cardiosselective, cardiononselective B-blockers. Mechanism of action. Indications for use. Contraindications. Side effects.
7. Antiplatelet agents, anticoagulants and fibrinolytics in the treatment of ischemic heart disease (heparin, fraxiparin, enoxaparin, neodicoumarin, syncumar, warfarin, acetylsalicylic acid, dipyridamole). Classification. Mechanism of action. Indications for use. Contraindications. Side effects.
8. The choice of cholesterol-lowering drugs in the treatment of pathology of the cardiovascular system. Statins. Classification. Mechanism of action. Indications for use. Contraindications. Side effects.
9. General understanding of the etiology, prevalence and pathogenesis of arterial hypertension. The main direction of action of drugs used to control high blood pressure. Classification of antihypertensive drugs.
10. Antihypertensive drugs with myotropic action (vasodilators): arterial vasodilators (hydralazine, minoxidil, diazoxide), arterial and venous vasodilators (sodium nitroprusside) and calcium antagonists (nifedipine). The mechanism of action of vasodilators on the tone of smooth muscles of the vascular wall. Efficiency when administered enterally. Use for the treatment of arterial hypertension and relief of hypertensive crises. Comparative characteristics. Indications, contraindications for use. Main side effects.
11. Medicines affecting the renin-angiotensin system. General ideas about the functioning of the renin-angiotensin system and its role in maintaining high blood pressure. Renin production and angiotensin II formation. Angiotensin receptors and their effects. Substances that block renin secretion (propranolol, clonidine, methyl dopa), angiotensin-converting enzyme inhibitors (captopril, enalapril), angiotensin receptor blockers (losartan). Effect on vascular resistance, reflex activity of the sympathetic nervous system. Efficacy through various routes of administration. Speed of development and duration of action. Application.
12. Classification of diuretics. Diuretics that have a direct effect on the functions of the renal tubular epithelium. Loop diuretics (furosemide). Localization and mechanism of diuretic action. The rate of development and duration of the diuretic effect. Application. Efficacy through various routes of administration. Side effects.
13. Combined use of diuretics.

5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

Literature: Appendix 1

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8. Control (questions, tests, tasks, etc.)

Practical lesson No. 4 Clinical pharmacology of diseases of the cardiovascular system. Rational pharmacotherapy of arrhythmia syndrome and circulatory failure.

1 Purpose: To provide ideas and the opportunity to gain knowledge:


- know the main indications for the use of the studied antiarrhythmic and cardiotonic drugs;
- know the main undesirable effects of antiarrhythmic and cardiotonic drugs;
- know the drugs used for blockades of the conduction system of the heart;
- be able to prescribe antiarrhythmic drugs in prescriptions in accordance with the main indications for their use.

Learning Objectives:

- consider issues of pharmacodynamics and pharmacokinetics of antiarrhythmic and cardiotonic drugs
- substantiate the main pharmacological effects of antiarrhythmic and cardiotonic drugs
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics

Main questions of the topic:

1. Mechanisms of arrhythmias. Basic approaches to pharmacological correction of arrhythmias. Classification of antiarrhythmic drugs.
2. Agents that block sodium channels (class I, membrane stabilizing agents): quinidine, procainamide, lidocaine, propafenone, etacizine. Mechanism of action of quinidine. Interaction of quinidine with ion channels of myocardiocyte membranes. Effect on automaticity, conductivity, excitability, effective refractory period. Differences in the effect of quinidine on healthy and pathologically altered myocardium. Effect on the contractile function of the heart, blood pressure. Anticholinergic and adrenolytic properties of quinidine. Indications for use.
3. Features of the action of procainamide, propafenone, etacizine.
4. Antiarrhythmic properties of lidocaine. Differences in interaction with sodium channels between lidocaine and quinidine. Effect of lidocaine on action potential duration and effective refractory period. Duration of action. Routes of administration. Use for the prevention of ventricular fibrillation in patients with myocardial infarction.
5. Drugs that prolong the effective refractory period and the duration of the action potential (class III, potassium channel blockers): amiodarone. Their effect on potassium channels in myocardiocytes. Antiadrenergic properties of amiodarone.
6. Calcium channel blockers (class IV): verapamil. Mechanism of antiarrhythmic action. Interaction with calcium channels. Effect on the sinoatrial and atrioventricular node. Use for supragastric tachyarrhythmias. Side effects.
7. The mechanism of the antiarrhythmic action of adenosine, potassium and magnesium preparations. Drugs used for blockades of the cardiac conduction system: M-anticholinergic blockers (atropine sulfate) and B-adrenergic agonists (isoproterenol).
8. Non-steroidal cardiotonic drugs. Drugs that inhibit phosphodiesterase activity (amrinone), B1-adrenergic receptor stimulants (dobutamine).
9. Features of the pharmacodynamics of cardiotonic drugs. Effect on the chronotropic function of the heart, myocardial oxygen demand. Application. Side effects.

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5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions.

7. Literature: Appendix 1

8. Control (questions, tests, tasks, etc.).

Practical lesson No. 5: Rational pharmacotherapy of rheumatic diseases. Acute rheumatic fever, CRHD, heart defects, rheumatoid arthritis, osteoporosis, reactive arthritis, gout.

2. Purpose of the lesson. To provide insight and the opportunity to gain knowledge:


- about the mechanisms of action and features of the use of drugs used for diseases of the musculoskeletal system
- about indications and contraindications for the use of drugs used for diseases of the musculoskeletal system
- teach how to choose the right drugs depending on the clinical situation.

3. Learning objectives:

- consider issues of pharmacodynamics and pharmacokinetics of drugs used for diseases of the musculoskeletal system
- indicate the main pharmacological effects of drugs used for diseases of the musculoskeletal system
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.

4. Main questions of the topic:

1. General concept of rheumatic diseases. Classification. Pathogenesis.
2. Pharmacotherapy for rheumatic fever. Mechanisms of action. Indications and contraindications. Side effects.
3. Pharmacotherapy for CRPS. Mechanisms of action. Indications and contraindications. Side effects.
4. Pharmacotherapy for heart disease. Mechanisms of action. Indications and contraindications. Side effects.
5. Pharmacotherapy for rheumatoid arthritis. Mechanisms of action. Indications and contraindications. Side effects.
6. Features of the use of antibiotic therapies in rheumatic diseases. Mechanism of action. Indications and contraindications. Side effects.
7. Etiotropic, symptomatic, pathogenetic treatment of rheumatic diseases.
8. Hormone therapy in rheumatic diseases.
9. General concept of rheumatic diseases. Classification. Pathogenesis.
10. Pharmacotherapy for rheumatic fever. Mechanisms of action. Indications and contraindications. Side effects.
11. Pharmacotherapy for osteoporosis. Mechanisms of action. Indications and contraindications. Side effects.
12. Pharmacotherapy for reactive arthritis. Mechanisms of action. Indications and contraindications. Side effects.
13. Pharmacotherapy for gout. Mechanisms of action. Indications and contraindications. Side effects.
14. Features of the use of antibiotic therapies in rheumatic diseases. Mechanism of action. Indications and contraindications. Side effects.

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15. Etiotropic, symptomatic, pathogenetic treatment of rheumatic diseases.

16. Hormone therapy in rheumatic diseases.

5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

Literature: Appendix 1

8. Control (questions, tests, tasks, etc.).

Practical lesson No. 6: Rational pharmacotherapy in the treatment of gastritis, peptic ulcer, pancreatitis, cholecystitis, hepatitis, cirrhosis of the liver. Part 1.

2. Purpose: To provide insight and the opportunity to gain knowledge:

- about groups of drugs that affect the functions of the digestive organs;
- about possible mechanisms of action and indications for the use of drugs that affect the functions of the digestive organs;
- about the mechanisms of action and features of the use of drugs used for dyspeptic syndrome;
- about indications and contraindications for the use of drugs used for dyspeptic syndrome;
- about the side and toxic effects of drugs used for dyspeptic syndrome;
- be able to prescribe the studied drugs in prescriptions in accordance with their main indications for use

3. Learning objectives:

- consider issues of pharmacodynamics and pharmacokinetics of drugs affecting the functions of the digestive organs;
- consider the issues of pharmacodynamics and pharmacokinetics of drugs used for dyspeptic syndrome;
- substantiate the main pharmacological effects of drugs affecting the functions of the digestive organs;
- substantiate the main pharmacological effects of drugs used for dyspeptic syndrome;
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics

4. Main questions of the topic:


17. Antisecretory agents used to treat stomach diseases. Classification.

18. Drugs that reduce the secretion of gastric glands: proton pump inhibitors (omeprazole, lansoprazole, pantoprazole, rabeprazole, esomeprazole), H₂ - histamine blockers (famotidine, ranitidine), M-cholinergic blockers (atropine sulfate, pirenzepine). Mechanisms of action. Indications and contraindications. Side effects.

19. Antacids (sodium bicarbonate, precipitated calcium carbonate, magnesium oxide, magnesium trisilicate, aluminum hydroxide). Combined antacids (Almagel, Almagel A, Maalox). Comparative characteristics of systemic and non-systemic agents. Indications and contraindications. Side effects.

20. Prostaglandins (misoprostol, etc.). Mechanism of action. Indications for use. Contraindications.

21. Agents that stimulate the reparative properties of the gastric mucosa (sucralfate, bismuth tripotassium dicitrate, carbenoxolone, misoprostol). Classification. Mechanism of action. Indications for use. Side effects.

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5. Emetics and antiemetics (Apomorphine hydrochloride, Metoclopramide, thiethylperazine, etaprazine, butyrophenone, domperidone). Mechanism of action. Indications for use. contraindications. Side effects.

6. Antimicrobial agents used for eradication therapy (amoxicillin, clarithromycin, furazolidone, de-nol, metronidazole, oxacillin, tetracycline). Mechanism of action. Indications for use, side effects.

7. Drugs that affect the motility of the gastrointestinal tract: antidiarrheals (cholestyramine, loperamide, tannin, smecta, activated carbon, etc.). Classification. Mechanisms of action. Indications for use. Side effects.

8. Regulators of gastroduodenal motility (gastrokinetics or prokinetics). Domperidone (Motilium), metoclopramide, cisapride. Mechanism of action. Application. Side effects.

9. Medicines that relax the motility of the gastrointestinal tract: antispasmodics. Atropine, pyrilene, benzohexonium, papaverine, no-spa, mebeverine. Classification. Mechanism of action. Indications for use.

10. Medicines that stimulate gastrointestinal motility: laxatives (bisacodyl, sodium picosulfate, magnesium sulfate, lactulose, macrogol, castor oil, liquid buckthorn extract, infusion of senna leaves. Classification. Mechanisms of action. Application depending on the localization of action. Side effects.

11. The concept of intestinal dysbiosis. Consequences of dysbiosis. Medicines used for intestinal dysbiosis. The concept of prebiotics and probiotics, their application. Side effects.

5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

Literature: Appendix 1

8. Control (questions, tests, tasks, etc.).


Practical lesson No. 7: Medicines used for liver diseases, cholecystitis. Drugs used for exocrine pancreatic insufficiency syndrome. Part 2

2. Purpose: To provide insight and the opportunity to gain knowledge:

- about the mechanisms of action and features of the use of drugs used for diseases of the liver, biliary tract and exocrine pancreatic insufficiency syndrome.
- about indications and contraindications for the use of drugs used for diseases of the liver, biliary tract and exocrine pancreatic insufficiency syndrome.
- about the side and toxic effects of drugs used for diseases of the liver, biliary tract and exocrine pancreatic insufficiency syndrome.
- write prescriptions for basic medications used for diseases of the liver, biliary tract and exocrine pancreatic insufficiency syndrome.
- choose the right drugs depending on the clinical situation.

3. Learning objectives:

- consider issues of pharmacodynamics and pharmacokinetics of drugs used for diseases of the liver, biliary tract and exocrine pancreatic insufficiency syndrome.
- indicate the main pharmacological effects of drugs used for diseases of the liver, biliary tract and exocrine pancreatic insufficiency syndrome.
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.

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4. Main questions of the topic:

1. Choleric agents. Classification.
2. Medicines that stimulate the formation of bile (“Cholenzim”, Holosas, oxafenamide, cyclone, nicodin, etc.). Classification. Mechanisms of action. Indications and contraindications. Side effects.
3. Agents that promote the excretion of bile (M-anticholinergics, antispasmodics of myotropic action). Classification. Mechanisms of action. Indications and contraindications. Side effects.
4. Cholelitholytic agents. (chenodiol, henofalk, ursofalk). Classification. Mechanisms of action. Indications and contraindications. Side effects.
5. Hepatoprotectors (legalon, ademetionine). Classification. Mechanisms of action. Indications and contraindications. Side effects. Features of use in children.
6. Medicines used for viral hepatitis B and C. Mechanism of action. Indications for use. Contraindications. Side effects.
7. Pancreatic enzymes, represented by amylase, lipase and trypsin (Creon, pancreatin, pancitrate, mezim forte, trienzyme, pangrol, prolipase, pankurmen, neonampur, liclease). Indications for use.
8. Complex preparations containing enzymes, bile components and hemicellulose - (digestal, cadistal, festal, cotazim-forte, menzym, panstal, rustal, enzistal). Indications for use.
9. Combined preparations – combicin (pancreatin + rice fungus extract); panzinorm forte (lipase, amylase, trypsin, chymotrypsin, cholic acid, amino acid hydrochlorides); pancreoflat (pancreatin and adsorbent simethicone).
10. Preparations containing lactase – tylactase, lactrase.
11. Antisecretory drugs. H₂-histamine receptor blockers (famotidine, ranitidine), proton pump inhibitors (omeprazole, lansoprazole, pantoprazole, rabeprazole, esomeprazole). Prokinetics (Domperidone (Motilium), metoclopramide, cisapri)). Mechanism of action. Application. Side effects.
12. Antienzyme drugs for the treatment of acute pancreatitis - pantrypin, aprotinin ((Gordox, Ingitril, Contrical, Trasylol). Indications for use Mechanism of action. Side effect.
13. Antispasmodics. Classification. Myotropic antispasmodics (drotaverine, papaverine, bencyclane, bendazole, mebeverine). Neutrotropic antispasmodics (M-cholinergic receptor blockers). Mechanism of action. Indications for use

5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

7. Literature: Appendix 1


8. Control (questions, tests, tasks, etc.)

Practical lesson No. 8: Rational pharmacotherapy of acute and chronic pyelonephritis, acute and chronic glomerulonephritis, chronic renal failure.

2. Purpose:

To provide insight and the opportunity to gain knowledge about:

- mechanisms of action and features of the use of drugs used for diseases of the genitourinary system;
- indications and contraindications for the use of drugs used for diseases of the genitourinary system;
- side and toxic effects of drugs used for diseases of the genitourinary system;
- writing prescriptions for basic drugs used for diseases of the genitourinary system

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3. Learning objectives:

- consider issues of pharmacodynamics and pharmacokinetics of drugs taken for diseases of the genitourinary system;
- pay attention to the main pharmacological effects of drugs used for diseases of the genitourinary system;

4. Main questions of the topic:

1. Diuretics. Classification
2. Diuretics that have a direct effect on the functions of the renal tubular epithelium. Loop diuretics (furosemide, ethacrynic acid). Localization and mechanism of diuretic action. The rate of development and duration of the diuretic effect. Indications for use. Efficacy through various routes of administration. Side effects.
3. Thiazides and thiazide-like diuretics (dichlorothiazide, cyclomethiazide, indapamide). Mechanism of action. Indications for use. Contraindications, side effects. Comparative characteristics of the diuretic effect of thiazides and loop diuretics.
4. The concept of saluretics and potassium-sparing diuretics. Features of the diuretic effect and influence on the ionic balance in the body of triamterene and amiloride.
5. Diuretics - aldosterone antagonists (spironolactone). Mechanism of action. The rate of development of the diuretic effect. Effect on potassium balance. Efficiency. Application. Side effects.
6. The principle of action of osmotic diuretics (mannitol). Indications for use. Dosing.
7. Combined use of diuretics.
8. Drugs used to treat pyelonephritis (beta-lactam antibiotics, penicillins, cephalosporins of the II-III generation, carbapenems and monobactam antibiotics, aminoglycosides, combination preparations of sulfonamides with trimethoprim, [fluoroquinolones](#) (levofloxacin, norfloxacin, ofloxacin, pefloxacin, ciprofloxacin), 8-hydroxyquinolines, spectrum of action, indications for use, side effects (nitrooline).
9. Principles of etiologic, pathogenetic and symptomatic therapy of glomerulonephritis. Immunosuppressive therapy for glomerulonephritis. Glucocorticoids (prednisolone, dexamethasone). Main pharmacological effects. Mechanism of action for glomerulonephritis
10. Treatment of glomerulonephritis with non-hormonal immunosuppressants (azathioprine (imuran), 6-mercaptopurine). Mechanism of action, application, side effects of cytostatics.
11. Treatment of glomerulonephritis with anticoagulants and antiplatelet agents. Direct anticoagulants (heparin), mechanism of action for glomerulonephritis. Side effects. Antiplatelet agents (dipyridamole), mechanism of action, indications, contraindications, side effects.
12. Symptomatic treatment for glomerulonephritis. Treatment of inflammatory, edematous and hematuric syndromes.


5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

7. Literature: Appendix 1

8. Security questions:

1. Drugs used for acute and chronic renal failure (adsorbix, furosemide, potassium antagonist, sodium bicarbonate, dopamine, dextrose)
2. Side effects of drugs used for acute and chronic renal failure
3. Contraindications for the use of drugs for acute and chronic renal failure

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4. List of additional drugs used for acute and chronic renal failure

Practical lesson No. 9: Rational pharmacotherapy of iron deficiency anemia, B12-deficiency anemia, acute and chronic leukemia.

2.Purpose: To provide insight and the opportunity to gain knowledge about:

- about the mechanisms of action and features of the use of drugs that affect hematopoiesis;
- about indications and contraindications for the use of drugs that affect hematopoiesis;
- about the side and toxic effects of drugs affecting hematopoiesis;
- choose the right drugs depending on the clinical situation;
- teach how to write prescriptions for basic medications that affect hematopoiesis.

3.Learning objectives:

- consider issues of pharmacodynamics and pharmacokinetics of drugs affecting hematopoiesis;
- indicate the main pharmacological effects of drugs affecting hematopoiesis;
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.


4. Main questions of the topic:

1. Stimulators of regeneration and hematopoiesis processes (stimulators of erythropoiesis, leukopoiesis).
2. Drugs used for hypochromic anemia (iron sulfate (sorbifer Durules, tardiferon), ferrous fumarate (ferronate, henefol), ferrous chloride (hemofer), ferrous sulfate (actiferrin, ferrogradumet), iron dextran, iron carboxymaltose, iron saccharate, ferkoven, ferrumlek, complex iron preparations (maltofer, ferlatum)
3. Classification of iron preparations by method of use. Comparative characteristics of the preparations, indications for use.
4. Side effects of iron supplements. Poisoning with iron preparations.
5. Effect of cobalt preparations (coamide) on erythropoiesis. Possible mechanism of action. Application. Human recombinant erythropoietin. Indications for use. Features of application. Routes of administration.
6. The role of ascorbic acid in the processes of iron absorption
7. Hematopoiesis stimulants (Epoetin alfa, beta, zeta; darbepoetin alfa)
8. Agents that stimulate leukopoiesis. Mechanism of action and indications for use of granulocyte colony-stimulating factor (filgrastim), granulocyte and macrophage colony-stimulating factor (molgramostim), pentoxyl, sodium nucleinate, methyluracil.
9. Drugs that inhibit leukopoiesis (novembiquin, myelosan, mercaptopurine, dopan, toifosfamide, etc.).
10. Drugs used to treat leukemia (azacytidine, daunorubicin, dexamethasone, decitabine, doxorubicin, idarubicin, mercaptopurine, mitoxantrone, cyclophosphamide, cytaribine)
11. Drugs used for chronic myeloid leukemia (antineoplastic and immunosuppressive drugs - imatinib, nilotinib, dasatinib, bosutinib, hydroxycarbamide)
12. Means affecting hemostasis. General characteristics of the hemostatic system. Classification of drugs affecting blood clotting.

5. Basic forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions.

7. appendix 1

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8. Security questions:

1. Clinical and pharmacological approaches to the use and dosage regimen of ionic iron-containing drugs (salts, polysaccharide compounds of divalent iron) and non-ionic compounds (ferric iron preparations, represented by an iron-protein complex and a hydroxide-polymaltose complex, iron (III)-hydroxide sucrose complex). International treatment protocol.

Practical lesson No. 10: Rational pharmacotherapy of diabetes mellitus, obesity, hypothyroidism, hyperthyroidism.

2. Purpose: To provide insight and the opportunity to gain knowledge:


- about the mechanisms of action and features of the use of hormonal agents.
- about indications and contraindications for the use of hormonal drugs.
- about the side and toxic effects of hormonal drugs.

3. Learning objectives:

- consider issues of pharmacodynamics and pharmacokinetics of hormonal drugs.
- indicate the main pharmacological effects of hormonal drugs.
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.

4. Main questions of the topic:

1. Drugs used for type 1-2 diabetes mellitus (insulin analogue of human, insulin glargine insulin glulisine, insulin degludec, insulin detemir, insulin glargine, insulin degludec insulin isophane, glibenclamide. Gliclazide, glimepiride, dapagliflozin, dulaglutide, insulin aspartate, canagliflozin, linagliptin, metformin, sitagliptin).
2. Insulin preparations and synthetic hypoglycemic agents. Mechanism of action of insulin. Insulin receptor. The effect of insulin on glucose transport into cells. Effect on muscles, liver, adipose tissue. Effect on blood glucose levels and its deposition in tissues. The use of insulin in diabetes mellitus. Routes and methods of administration. Dosing principles. Types of insulins. Human, porcine and bovine insulins. Solubility and duration of action.
3. Ultra-short-acting insulin preparations (insulin lispro, insulin aspart). Long-acting insulins. Insulin glargine (Lantus). Characteristics of pharmacokinetic parameters.
4. Drugs used for hypoglycemia syndrome (glucagon, adrenaline, glucose). Mechanism of antihypoglycemic action. Side effects.
5. Oral hypoglycemic agents. Sulfonylurea derivatives (glibenclamide, gliclazide, glimepiride, etc.). Mechanism of hypoglycemic action. Interaction with potassium channels β -cells and influence on insulin release. Potentiating the action of insulin on tissues and influencing the level of glucagon in the blood. Application. Prandial glycemic regulators (nateglinide). Effect on postprandial insulin secretion. Dosage regimen.
6. Biguanides (metformin). Mechanism of antidiabetic action. Effect on the intake of glucose into the body and its utilization in tissues. Features of application.
7. Use of thiazolidinedione derivatives (rosiglitazone) and acarbose in diabetes mellitus. Mechanism of action of drugs. Indications for use
8. Drugs used for adrenal insufficiency syndrome. Glucocorticosteroids (hydrocortisone, cortisone acetate, prednisolone, methylprednisolone, triamcinolone, betamethasone, dexamethasone).

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Mineralocorticoids (fludrocortisone). Mechanism of action, indications. Side effects. Features of use in childhood.

9. Hormonal drugs, their synthetic analogues, substitutes and antagonists. Classification. Sources of receipt.

10. Preparations of hypothalamic and pituitary hormones (corticotropin, cosyntropin, somatotropin, thyrotropin, lactin, menopausal gonadotropin (menotropins), prolan, oxytocin, carbetocin, vasopressin, desmopressin, terlipressin, pituitrin, rifathiroin, gonadorelin, octreotide, lanreotide, pasireotide, somatostatin). Mechanism of action. Indications and contraindications for use. Side effect.

11. Thyroid hormone preparations (methylthiouracil, mercazolil, propylthiouracil, diiodotyrosine, potassium iodide). Mechanism of action. Indications and contraindications for use. Side effect.

12. Antithyroid drugs. (iodine, diiodotyrosine, mercazoly, propylthiouracil, potassium perchlorate, radioactive iodine). Indications and contraindications for use. Side effects.

13. Drugs used for hypothyroidism (levothyroxine sodium, thyroxine, triiodothyronine hydrochloride, thyroidin). Mechanism of action. Application, contraindications. Side effect.

14. Glucocorticoids (hydrocortisone, prednisolone, etc.). Mechanism of action. Application, contraindications. Side effect.

15. Mineralocorticoids (deoxycorticosterone acetate, etc.). Mechanism of action. Application, contraindications. Side effect.

16. Drugs used for disorders of sexual development and congenital anomalies of the genital organs, congenital anomalies of the ovaries, fallopian tubes and broad ligaments, congenital ovarian torsion, cystic anomalies of the ovary (estrogens, gestagens, anabolic steroids, antibiotics)

5. Main forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups, discussions.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

7. Literature: Appendix 1

8. Security questions:

1. Clinical and pharmacological approaches to the justification, choice, dosage regimen-hypo, - hyperlipidemic drugs.

2. Assessment of the effectiveness and safety of drugs used for diabetes.

Annex 1

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Practical lesson No. 12: “Anti-blastoma drugs.”

2.Purpose:To give future doctors knowledge about the general principles of pharmacodynamics and pharmacokinetics of anti-blastoma drugs in order to develop their skills in providing information and consulting services to medical workers and the population.

3.Learning objectives:

provide knowledge about the general principles of pharmacodynamics and pharmacokinetics anti-blastoma drugs and changes in the functions of organs and systems caused by pharmacological effects;

teach to analyze the primary pharmacological reaction between drugs and biomolecules;


teach the possibility of using medicines based on ideas about their properties;

teach general principles of recipe design and preparation of recipes;

teach how to calculate doses and concentrations of medicinal substances;

4.Main questions of the topic:

1. The concept of anti-blastoma drugs. Classification.
2. Mechanism of action of anti-blastoma drugs.

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3. Features of the spectrum of antitumor action of alkylating agents, antimetabolites, antibiotics
4. Features of the spectrum of antitumor effects of herbal drugs, hormonal and antihormonal drugs (tamoxifen, flutamide),
5. Features of the spectrum of antitumor action of various synthetic agents (prospidin), enzymes (aspiraginase), drugs platinum (cisplatin).
6. Complications arising from the use of antitumor drugs and their prevention.
7. Immunosuppressive properties of cytostatic agents.
8. Monoclonal antibodies - tarstuzumab, rituximab, bevacizumab, cetuximab
9. Protein kinase inhibitors imatinib, gifetinib, erlotinib, temsirolimus and other antitumor drugs: asparaginase, hydroxycarbamide

5. Main forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups, discussions.

6. Types of control for assessing the level of achievement of final RO disciplines 7.s: oral questioning, solving test tasks and situational problems, writing prescriptions

Literature: Appendix 1

8. Security questions:

1. Give the concept of anti-blastoma drugs. Classification.
2. What is the mechanism of action of anti-blastoma drugs.
3. Tell us about the features of the spectrum of antitumor action of alkylating agents, antimetabolites, antibiotics
4. Tell us about the features of the spectrum of antitumor effects of herbal drugs, hormonal and antihormonal drugs (tamoxifen, flutamide)
5. Tell us about the features of the spectrum of antitumor action of various synthetic drugs (prospidin), enzymes (aspiraginase), platinum drugs (cisplatin)
6. Tell us about the complications that arise during use antitumor drugs and their prevention.
7. Tell us about the immunosuppressive properties of cytostatic agents.
8. Give the concept of monoclonal antibodies - tarstuzumab, rituximab, bevacizumab, cetuximab
9. Tell us about the protein kinase inhibitors imatinib, gifetinib, erlotinib, temsirolimus and other antitumor drugs: asparaginase, hydroxycarbamide


Practical lesson No. 13. Hormonal agents. Corticosteroid drugs.

2. Purpose: To provide future doctors with knowledge about the laws of pharmacodynamics and pharmacokinetics of hormonal and corticosteroid drugs in order to develop their skills in providing information and consulting services to medical workers and the population

To provide insight and the opportunity to gain knowledge:

- about the mechanisms of action and features of the use of hormonal agents
- about indications and contraindications for the use of hormonal drugs
- about the side and toxic effects of hormonal drugs

3. Learning objectives:

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- consider issues of pharmacodynamics and pharmacokinetics of hormonal drugs
- indicate the main pharmacological effects of hormonal drugs
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.

4. Main questions and topics:

1. Hormonal drugs, their synthetic analogues, substitutes and antagonists. Classification. Sources of receipt.
2. Preparations of hypothalamic and pituitary hormones (corticotropin, cosyntropin, somatotropin, thyrotropin, lactin, menopausal gonadotropin (menotropins), prolan, oxytocin, carbetocin, vasopressin, desmopressin, terlipressin, pituitrin, rifathiroin, gonadorelin, octreotide, lanreotide, pasireotide, somatostatin). Mechanism of action. Indications and contraindications for use. Side effects.
3. Thyroid hormone preparations (methylthiouracil, mercazolyl, propylthiouracil, diiodotyrosine, potassium iodide). Mechanism of action. Indications and contraindications for use. Side effects.
4. Antithyroid drugs (iodine, diiodotyrosine, mercazolyl, propylthiouracil, potassium perchlorate, radioactive iodine). Indications and contraindications for use. Side effects.
5. Drugs used for hypothyroidism (levothyroxine sodium, thyroxine, triiodothyronine hydrochloride, thyroidin). Mechanism of action. Application, contraindications. Side effect.
6. Glucocorticoids (hydrocortisone, prednisolone, etc.). Mechanism of action. Application, contraindications. Side effect.
7. Mineralocorticoids (deoxycorticosterone acetate, etc.). Mechanism of action. Application, contraindications. Side effect.
8. Drugs used for disorders of sexual development and congenital anomalies of the genital organs, congenital anomalies of the ovaries, fallopian tubes and broad ligaments, congenital ovarian torsion, cystic anomalies of the ovary (estrogens, gestagens, anabolic steroids, antibiotics)
9. Male sex hormones (androgens). Mechanism of action, indications and contraindications, dosage regimen, side effects.

5. Main forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups, discussions.


6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

7. Literature: Appendix 1

8. Security questions:

Prescription drugs:

Corticotropin- Corticotropinum (bottles 10 units No. 10)
 Somatotropin- Somatotropinum (bottles 4 units No. 10)
 Thyrotropin (bottles 10 units No. 20)
 Lactin – Lactinum (bottles 200 units No. 10)
 menopausal gonadotropin - Gonadotropinum menopausticum - bottles 75 units No. 5
 Chorionic gonadotropin – Gonadotropinum chorionicum - bottles 500 units No. 6
 Oxytocin- Oxytocinum (solution 1 ml (5 units) No. 5 in ampoules)
 Carbetocin- Carbetocinum (solution 100 mcg/ml No. 5)
 Desmopressin- Desmopressinum (0.2 mg tablet No. 30)
 Pituitrin- Pituitrinum (solution 1 ml (5 units) No. 5)
 Gonadorelin - Gonadorelin (powder 2 mg No. 50)

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Somatostatin-Somatostatinum (powder for injection 250 mcg)
 Methylthiouracil - Methylthiouracilum (table 0.25 No. 20)
 Mercazolil- Mercazolil (tab.0.005 No. 100)
 Diodotyrosine-Diodthyrosinum (tab. 0.05 No. 20)
 Potassium iodide - Kalii iodidum (solution 3% -200 ml)
 Levothyroxine sodium - Levothyroxinum natrium (tab. 0.0001 No. 50)

Drugs to determine group affiliation:

Corticotropin
 Somatotropin
 Thyrotropin
 Lactin
 gonadotropin menopausal
 Chorionic gonadotropin
 Oxytocin
 Carbetocin
 Desmopressin
 Pituitrin
 Gonadorelin-
 Somatostatin
 Methylthiouracil
 Mercazolil
 Diodotyrosine
 Potassium iodide
 Levothyroxine sodium

Practical lesson No. 14: Drugs affecting the central nervous system. Sleeping pills.

Anticonvulsants, antiepileptic drugs.

2. Purpose of the lesson. To provide insight and the opportunity to gain knowledge:


- about the mechanisms of action and features of the use of drugs affecting the central nervous system.
- about indications and contraindications for the use of drugs affecting the central nervous system.
- about the side and toxic effects of drugs affecting the central nervous system.

3. Learning objectives:

- consider issues of pharmacodynamics and pharmacokinetics of drugs affecting the central nervous system;
- indicate the main pharmacological effects of drugs affecting the central nervous system;
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.

4. Main questions and topics:

1. General understanding of the causes and pathogenesis of seizures. Principles of treatment of convulsive syndrome. Classification of anticonvulsants.
2. Antiepileptic drugs that block sodium channels

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(diphenine, carbamazepine, lamotrigine, sodium valproate, topiramate). Features of pharmacokinetics and pharmacodynamics of anticonvulsants and their effectiveness in various forms of epilepsy. Indications for use. Side effects.

3. Antiepileptic drugs that block T-type calcium channels (ethosuximide, trimethine, sodium valproate). Features of pharmacokinetics and pharmacodynamics of anticonvulsants and their effectiveness in various forms of epilepsy. Indications for use. Side effects.

4. Antiepileptic drugs that activate the GABAergic system (benzodiazepines (diazepam, lorazepam, clonazepam), phenobarbital, topiramate, sodium valproate, vigabatrin, tiagabine). Features of pharmacokinetics and pharmacodynamics of anticonvulsants and their effectiveness in various forms of epilepsy. Indications for use. Side effects.

5. Antiepileptic drugs that reduce the activity of the glutamatergic system (lamotrigine, topiramate). Indications for use. Side effects.

6. Characteristic manifestations and causes of the development of parkinsonism. Approaches to drug correction of extrapyramidal disorders. Classification of antiparkinsonian drugs.

7. Drugs that activate dopaminergic effects: dopamine precursors (levodopa), drugs that stimulate dopamine receptors (bromocriptine), monoamine oxidase inhibitors (selegiline), substances that enhance the release of dopamine (amantadine). Comparative characteristics of pharmacological properties.

8. Use of DOPA decarboxylase inhibitors (carbidopa, benserazide) in the treatment of parkinsonism.

9. Antiparkinsonian drugs that inhibit cholinergic processes in the central nervous system (trihexyphenidyl hydrochloride, cyclodol). Mechanism of action, effectiveness, undesirable effects.

10. Meningeal lesion syndrome (meningitis). General principles of pharmacotherapy of meningitis. Antibacterial agents used for neuroinfections. (benzylpenicillin, oxacillin, amikacin, tobramycin, ampicillin, cefotaxime, ceftriaxone, ceftazidime, vancomycin, fosfomycin, meropenem, clindamycin, gentamicin, etc.)

eleven. Acute cerebrovascular accident (ACVA). Principles of treatment for stroke: undifferentiated (regardless of the type of stroke) and differentiated therapy (ischemic and hemorrhagic stroke).

12. Stroke of hemorrhagic type. Principles of drug therapy. Coagulants (hemostatics) Thrombin, vitamin K, vikasol. Classification. Drugs used to improve blood clotting and reduce vascular permeability in hemorrhagic type.


13. CVA of ischemic type. Principles of drug therapy. Drugs used to normalize and relieve ischemic phenomena. Antiplatelet agents (acetylsalicylic acid, dazoxyben, epoprostenol, abciximab, ticlopidine, clopidogrel, dipyridamole, anturan). Anticoagulants (heparin, fraxiparin, enoxyparin, neodicoumarin, syncumar, warfarin, phenylin).

14. Neurometabolic agents: nootropic agents. Classification. Mechanism of action, indications, contraindications for use. Nootropic drugs. Definition of the concept. The effect of piracetam and vinpocetine on cerebral circulation, metabolic processes in the brain, higher integrative functions of the brain, learning ability, memory. The rate of development of the nootropic effect. Indications for use.

15. Antihypoxants and antioxidants. Principles of action, indications, contraindications, side effects.

16. Drugs that improve cerebral circulation (vasoactive drugs). Indications, contraindications, side effects.

5. Main forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups, discussions.

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6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

7.Literature: Appendix 1


8.Security questions:

Prescription drugs:

Carbamazepine - Carbamazepinum (tab. 0.2 No. 20)
 Vicasol-Vicasolum (solution 1% - 1 ml)
 Diphenin – Dipheninum (table 0.1 No. 20)
 Lamotrigine – Lamotriginum (table 0.1 No. 10)
 Ethosuximide –Aethosuximidum (drop.0.25 No. 50)
 Trimetin-Trimetinum (tab. 0.1 No. 30)
 Sodium valproate - Valproate sodium (powder 0.4)
 Diazepam – Diazepamum (tab. 0.005 No. 100)
 Lorazepam – Lorazepamum (tablet 0.5 No. 20)
 Levodopa- Levodopum (drop. 0.5 No. 500)
 Clonazepam – Clonazepamum (table 0.5 No. 30)
 Phenobarbital - Phenobarbitalum (table 0.1 No. 6)
 Bromocriptin – Bromocriptinum (table 0.025 No. 30)
 Amantadine – Amantadinum (tab. 0.1 No. 30)
 Cyclodol – Cyclodolum (tab.0.001 No. 10)
 Ampicillin – Ampicillin (table 0.25 No. 20)
 Gentamycin -Gentamycini sulfas (solution 4% - 2 ml amp. No. 10)
 Cefotaxim- Cefotaximum (1.0 No. 20 in bottles)
 Cerebrolysin - Cerebrolysin (solution 5% - 1 ml)
 Pyriditol – Pyriditolum (tab. 0.01 No. 20)
 Acetylsalicylic acid - Acidum acetylsalicylicum (table 0.5 No. 10)
 Thrombin – Thrombinum (125 units No. 10 in ampoules)
 Actovegin (amp. 10% - 2 ml No. 10)
 Nicergoline (tab. 0.01 No. 30; 0.004 fl. No. 4)
 Heparin – Heparinum (solution 5 ml (1 ml-10000 units))
 Neodicumarin-Neodicumarinum (tab.0.05 No. 10)
 Mexidol – Mexidol tab. 0.125 No. 30; solution 5% - 2 ml)
 Cinnarizine - Cinnarisinum (tab. 0.025 No. 50)
 Troxevasin –Troxeerutin (drop. 0.3 No. 50; gel 2% -40.0)

Preparations for determining group affiliation:

Clonazepam
 Ceftriaxone
 Acetylsalicylic acid
 Dipyridamole
 Fraxiparine
 Piracetam
 Amikacin
 Askorutin
 Vinpocetine

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Semax
 Pentoxifylline
 Acediprol
 Troxevasin
 Sodium valproate
 Diazepam
 Lorazepam
 Levodopa
 clonazepam
 Phenobarbital
 Bromocriptine
 Amantadine
 cyclodol
 Ampicillin
 Gentamicin

Practical lesson No. 15: Psychotropic drugs. CNS depressants. CNS stimulants

2. Purpose of the lesson. To provide insight and the opportunity to gain knowledge:

- about the mechanisms of action and features of the use of drugs affecting the central nervous system.
- about indications and contraindications for the use of drugs affecting the central nervous system.
- about the side and toxic effects of drugs affecting the central nervous system.

3. Learning objectives:


- consider issues of pharmacodynamics and pharmacokinetics of drugs affecting the central nervous system.
- indicate the main pharmacological effects of drugs affecting the central nervous system.
- draw students' attention to the peculiarities of the properties of individual drugs and give their comparative characteristics.

4. Main questions of the topic:

1. Antipsychotics (neuroleptics). Definition. Classification. Phenothiazine derivatives: (aminazine, levopromazine, triftazine, fluorophenazine, chlorpromazine, trifluoperazine), derivatives of thioxanthene (chlorprothixene), butyrophenone (haloperidol, droperidol), diphenylbutylpiperidine (fluspirilene, pimozide). "Atypical" antipsychotics: derivatives of dibenzodiazepine (clozapine), thienobenzodiazepines (olanzapine, quetiapine), benzamide (sulpiride), benzisoxazole (risperidone).

2. Antidepressants. General characteristics of depressive states. Classification of antidepressants: monoamine oxidase inhibitors of irreversible (nialamide, transamine) and reversible (pirlindole) action; inhibitors of neuronal monoamine uptake: tricyclic (imipramine, amitriptyline, imizin), tetracyclic (maprotiline); selective serotonin reuptake inhibitors (duloxetine, sertraline, fluoxetine, fluvoxamine, mirtazapine, agomelatine, venlafaxine). The effect of antidepressants on storage, metabolism, reuptake of monoamines, and receptors for them.

3. Use of antidepressants. Main side effects. Interaction of MAO inhibitors with other antidepressants and sympathomimetics.

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4. Lithium preparations. Pharmacokinetics and pharmacodynamics of lithium carbonate. Influence on ion transport, exchange of neurotransmitters and membrane phospholipids. Main effects. Application. Difference from neuroleptics. Dosing. Side effects and complications.

5. Anxiolytic drugs (tranquilizers). Benzodiazepine derivatives (chlordiazepoxide, diazepam, phenazepam, medazepam, alprazolam, midazolam). Serotonin receptor agonists (buspirone). Anxiolytics of various chemical groups (amizil). Mechanism of action. Indications for use, side effects.

6. The effect of tranquilizers on the functions of the central nervous system. Features of metabolism. Application. Undesirable effects. The concept of daytime tranquilizers. Tolerance. Drug addiction. Interaction with other drugs. Benzodiazepine antagonists (flumazenil).

7. Sedatives (sodium bromide, valerian preparations). Effect on the central nervous system. Indications for use. Side effects.

8. Psychostimulants. Classification: derivatives of purine (caffeine), piperidine (pyridrol, meridyl, methylphenidate) and sydnimine (mesocarb, sydnocarb). Mechanism of action of caffeine. Interaction of caffeine with adenosine receptors and its effect on phosphodiesterase activity. The effect of caffeine on the central nervous system, heart activity, vascular tone, blood pressure, gastrointestinal tract, kidney function. Application. Features of dosing depending on the type of higher nervous activity. Side effects. Tolerance and drug dependence.

9. Features of the pharmacological properties of methylphenidate and mesocarb.

10. Hypnotics: barbituric acid derivatives (amytal), benzodiazepines (nitrazepam, triazolam) and hypnotics of different chemical structures (zopiclone, zolpidem). Mechanism of hypnotic action. Effect on sleep structure. Speed of onset, severity and duration of the hypnotic effect. Aftereffect. Possibility of developing tolerance and drug dependence. Withdrawal syndrome. Application. Acute poisoning with sleeping pills.

11. Hypotensive drugs (carbamazepine, valproic acid, lamotrigine, topiramate). Indications for use. Side effect.

5. Main forms/methods/technologies of training to achieve the final RO of the discipline: work in small groups, discussions.

6. Types of control to assess the level of achievement of the final RO of the discipline: oral questioning, solving test tasks and situational problems, writing prescriptions

7. Literature: Appendix 1

8. Security questions:

1. Antidepressants. General characteristics of depressive states.
2. Classification of antidepressants
3. Use of antidepressants. Main side effects. Interaction of MAO inhibitors with other antidepressants and sympathomimetics.
4. Lithium preparations.
5. Side effects and complications

Prescription drugs:


Aminazine – Aminazinum (solution 2.5% -2 ml No. 6; dragee 0.025 No. 50)

Triftazin – Triphthazinum (tab. 0.1 No. 100)


Chlorpromazine - Chlorpromazinum (dragee 0.025 No. 50)

Trifluoperazine - Trifluoperazinum (tab. 0.005 No. 100)

Chlorprothixenum (tab. 0.015 No. 50)

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Haloperidol – Haloperidolum (solution 0.5% -1ml; tablet 0.015 No. 50)
 Droperidol – Droperidolum (solution 0.25% -5 ml No. 4)
 Clozapine- Clozapinum (tab. 0.05 No. 10)
 Olanzapine- Olanzapinum (tab. 0.005 No. 50)
 Sulpiride (tablet 50 mg No. 50)
 Risperidon-Risperidonum (table 0.002 No. 30)
 Nialamid - Nialamidum (tab. 0.025 No. 50)
 Imipramine - Imipramine (solution 1.25% -2 ml No. 10; tablet 0.025 No. 20)
 Amitriptyline - Amitriptyline (tab. 0.025 No. 10)
 Duloxetine - Duloxetinum (tablet 60 mg No. 30)
 Sertraline- Sertralinum (table 0.5 No. 100)
 Fluoxetine-Fluoxetinum (caps. 0.02 No. 20)
 Fluvoxamine - Fluvoxaminum (table 0.05 No. 20)
 Mirtazapine- (tab. 45 mg No. 20)
 Agomelatine - Agomelatinum (tab. 0.025 No. 14)
 Venlafaxin-Venlafaxinum (tab.0.075 No. 28)
 Chlordiazepoxide –Chlordiazepoxydum (dragee 0.025 No. 100)
 Diazepam - Diazepamum (tab. 0.005 No. 100)
 Phenazepam- Phenazepamum (tab 0.001 No. 50)
 Medazepam - Medazepamum (table 0.01 No. 10)
 Midazolam - Midazolam (solution 0.5% -1 ml No. 6)
 Buspirone-Buspironum (tab. 0.01 No. 20)
 Flumazenil - Flumazenilum (solution 0.1% -10 ml No. 10)
 sodium bromide - Natrii bromidum (solution 3% -200 ml)
 valerian tincture - Tinctura valerianae (50 ml)
 Caffeine sodium benzoate – Coffeinum natrii-benzoas (table 0.1 No. 6)
 Sydnocarb - Sydnocarbum (tab. 0.005 No. 20)
 Nitrazepam - Nitrazepamum (tab. 0.005 No. 20)
 Zopiclonum - Zopiclonum (tab. 0.0075 No. 5)
 Carbamazepine-Carbamazepinum (tab. 0.2 No. 10)
 Lamotrigine- Lamotriginum (table 0.1 No. 10)


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Preparations for determining group affiliation:


Aminazine
 Triftazin
 Chlorpromazine
 Trifluoperazine
 Chlorprothixene
 Haloperidol
 Droperidol
 Clozapine
 Olanzapine
 Sulpiride
 Risperidone
 Nialamid
 Imipramine
 Amitriptyline
 Duloxetine
 Sertraline
 Fluoxetine
 Fluvoxamine
 Mirtazapine
 Agomelatine
 Venlafaxine
 Chlordiazepoxide
 Diazepam
 Phenazepam
 Medazepam
 Midazolam
 Buspirone
 Flumazenil
 sodium bromide
 Valerian tincture
 Caffeine sodium benzoate
 Sidnocarb
 Nitrazepam
 Zopiclone
 Carbamazepine
 Lamotridge

Annex 1

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