MINISTRY OF HEALTH OF UKRAINE
POLTAVA STATE MEDICAL UNIVERSITY
Department of Pharmacology, Clinical Pharmacology and Pharmacy

Methodical guidelines
for applicants for education the second (master's) level of higher education
independent work
in preparation for the practical lessons and the lesson

Academic subject	**Pharmacology**
Module 2	**Pharmacology of agents affecting the function of executive organs and systems. Pharmacology of chemotherapeutic drugs. Antidotes.**
Year of study	**III**
Faculty	**International Faculty Specialty of «Dentistry»**

№	Topics	Hour
Content module 5. Medicines that affect the function of the respiratory system, digestion and the blood system. Anticancer drugs.		
1	Medications for respiratory function.	
2	Medicines that affect the function of the digestive system. Means that affect the appetite and function of the glands of the stomach	
3	Medicines that affect the function of the digestive system. Drugs affecting the function of the liver, gall bladder, pancreas and intestines.	
4	Drugs affecting the blood coagulation system and fibrinolysis.	
5	Drugs that affect blood formation. Anticancer drugs.	
Content module 6. Vitamin, hormonal, anti-inflammatory, anti-allergic and immunotropic drugs.		
6	Water-soluble and fat-soluble vitamin preparations. Therapy with vitamin preparations and its types. Classification of vitamin preparations.	
7	Hormonal drugs (peptide), their synthetic substitutes and antagonists.	
8	Hormonal drugs (steroidal), their synthetic substitutes and antagonists.	
9	Anti-inflammatory, anti-allergic and immunotropic drugs.	
Content module 7. Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs.		
10	Antiseptic and disinfectant medicines.	
11	Antiseptic and disinfectant medicines (continued).	
12	Synthetic antimicrobial agents. Fluoroquinolones. Antimycotics.	
13	Pharmacology of antibiotics.	
14	Pharmacology of antibiotics (continued).	
15	Antituberculous, antiviral, antispirochetic drugs.	
16	Antiparasitic and antiprotozoal drugs.	
Content module 8. Preparations of macro- and microelements. Enzyme and antiferment preparations. Plasma substitutes and preparations for parenteral nutrition. Medicines used for the treatment and prevention of diseases of hard tissues, tooth pulp and periodontal disease. Drugs that affect the metabolism of bone and cartilage. Antidotes.		
17	Macro and micronutrient preparations, enzyme and antiferment preparations, plasma substitutes and preparations for parenteral nutrition.	
18	Medicines used for the treatment and prevention of diseases of hard tissues, tooth pulp and periodontal disease. Drugs affecting the metabolism of bone and cartilage.	
19	Principles of treatment of acute poisoning. Principles of antidote therapy. Antidote drugs.	
20	Principles for the treatment of emergency conditions.	

Content module 7	**Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs.**
To the topic №10	**Antiseptic and disinfectant medicines.**

1. The relevance of the topic: drugs that have antimicrobial properties are divided into two groups. The first group: agents that adversely affect microorganisms and are not characterized by selectivity of action. These include antiseptics and disinfectants. The second group of substances contains antimicrobial agents of selective action, which relate to chemotherapeutic agents.

2. Learning objectives:

1. To generalize and analyze the pharmacological characteristics of the main pharmacological agents, to explain the mechanisms of action.
2. Interpret indications for the use of disinfectants and antiseptics in accordance with the knowledge of pharmacodynamics.
3. Assess the benefit / risk ratio when using the main groups of disinfectants and antiseptics.
4. Create an algorithm for helping patients with acute poisoning with acids, alkalis, compounds of heavy metals. Understand the possibility of using antidotes in each case.
5. Explain the dependence of the action of disinfectant and antiseptic drugs on the pharmacokinetics of patients of different ages, concomitant diseases and their therapy.
6. To make a judgment on the possibility of side effects when using disinfectants and antiseptics in order to prevent them.
7. Write out prescriptions and conduct pharmacotherapeutic analysis of the prescribed drugs from the group of disinfectant and antiseptic drugs.

3. Basic knowledge, abilities, skills, necessary for studying the subject (interdisciplinary integration):

Names of previous disciplines	Skills gained
1. Latin Language	Prescribing skills.
2. Microbiology	Use the necessary preparation based on the structural features of viruses, bacteria, and protozoa.
3. General surgery	Define the concept of antiseptics and disinfection. Choose the necessary disinfectant and antiseptic

4. Tasks for independent work in preparation for the lesson.

4.1. The list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
Disinfectants	Used for the destruction of microorganisms in the environment (processing tools, facilities, utensils, etc.)
Antiseptic agents	Used to kill microorganisms on the outer shells of a macroorganism (skin, mucous membranes, wounds)
Chemotherapeutic agents	Selectively destroy pathogenic microflora in the body
Bacteriostatic effect	The ability of the drug to temporarily stop the division and growth of microbes
Bactericidal effect	The ability of the drug to destroy microbes

PREPARATIONS

№	Drug name	Release form	Method of determining
HALOGENATED COMPOUNDS			

1.	Spiritus iodine solution Sol. Iodi spirituosae	Flac. 5% 25 ml spiritus solution	Lubricate skin around wounds
2.	Ioddicerin Ioddicerinum	Flac. 25 ml	Lubricate skin around wounds
3.	Iodinol Iodinolum	Flac. 100 ml	For processing core / channels
4.	Povidone iodine Povidone-iodine	Liniment 10% by 30g Flak. 10% 100 ml Suppository. vag. 0.2	For treating affected skin surface 1 suppose. in the vagina
5.	Chloramine B Chloraminum B	Powder Flak. 0.5%, 5% solution	For the processing of non-metallic tools
6.	Chlorhexidine bigluconate Chlorhexidinum bigluconas	Flac. 20% 500 ml Flak. 0.05% 100 ml	Dissolve in ethyl alcohol 1:40 for hand treatment to a surgeon For rinsing
7.	Sodium hypochlorite Sodium hypochlorite	Flac. 3% 100 ml	For the treatment of core / canals
OXIDIZING AGENTS			
1.	Hydrogen peroxide solution diluted Sol. Hydrogenii peroxydi diluta	Flac. 3% 40 ml	An official solution for washing wounds
2.	Potassium permanganate Kalii permanganas	Flac. 3 and 5 g Flask. 0.1%, 0.5%, 5% solution	Solution for gastric lavage, rinse, burn treatment
ACIDS and ALKALIS			
1	Boric acid Acidum boricum	Powder 10 g Flak. 3% 20 ml spir. solution Ointment 5% 25 g	Sprinkle wounds Drops in the ears Lubricate skin
2	Salicylic acid Acidum salicylicum	Flac. 1%, 100 ml spir. solution	Lubricate affected skin
3	Ammonia solution Sol.Ammonium caustici	Flac. 10% 40 ml	Inhalation, for the treatment of the surgeon's hands (25ml in 5l of water) Inside 5-10 drops in 100ml
4.	Sodium bicarbonate Sodium hydrocarbonate	Powder 50 g Flak. 4% 100ml	For rinsing, rinsing, inhalation 0.5% - 2% solutions Intravenous drip
METAL COMPOUNDS			
1.	Silver nitrate Argenti nitras	Flac. 2%, 5%, 10% 10ml	Lubrication, cauterization of granulations, eye drops
2.	Zinc oxide Zinci ohydum	powder Ointment 10% Pasta officin	Sprinkle wounds Lubricate skin

4.2. Theoretical questions for the lesson:

1. Antiseptic drugs. The concept of antiseptics and disinfection.
2. The history of the use of antiseptic agents. Requirements for modern antiseptic agents.
3. Classification of antiseptic and disinfectants by chemical structure.
4. Pharmacology of antiseptic and disinfectants of an inorganic nature. The mechanism of action of halogens and halogen-containing compounds (chlorine preparations: chlorhexidine bigluconate, sodium hypochlorite), iodine preparations: alcohol iodine solution, iodine dicerin, iodinol, povidone-iodine). Indications for use, side effects. Acute and chronic poisoning and relief measures.

5. The mechanism of action, indications for the use of oxidizing agents: hydrogen peroxide, potassium permanganate. The dependence of the pharmacological action on the concentration of the solution.
6. The antiseptic and disinfecting effect of acid and alkali preparations (salicylic acid, boric acid, citric acid, sodium bicarbonate, ammonia solution, sodium tetraborate).
7. The mechanism and types of action of salts of heavy metals (pre-resorptive, resorptive). Factors determining the antimicrobial activity of preparations of salts of heavy metals. Schmiedeberg series. Features of the use of mercury, lead, silver, bismuth, copper, zinc. Side effects of drugs of salts of heavy metals. Acute poisoning. Help with acute poisoning with salts of heavy metals, the principles of antidote therapy.

4.3. Practical tasks performed in preparation for the lesson:

4.3.1. Write down the prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Hydrogen peroxide in a solution for treating wounds.
2. Potassium permanganate in a solution of 0.1%, 0.5%, 5%.
3. A solution of alcohol iodine in vials.
4. Iodicerin in vials.
5. Chlorhexidine bigluconate in vials of 0.05% and 20% solution.
6. Sodium hypochlorite.
7. Silver nitrate.
8. Ammonia solution.

4.3.2. Fill in the table:

Drugs	Mechanism of action	Indications for use	Adverse reactions
Potassium permanganate			
Hydrogen peroxide			
Iodine solution			
Iodicerin			
Chlorhexidine bigluconate			
Sodium hypochlorite			
Silver nitrate			
Ammonia solution			

4.3.3. Solve test items:

1. What antiseptics belong to the group of oxidizing agents:

A. Ammonia solution B. Silver nitrate C. Formaldehyde D. Phenol E. * Potassium permanganate

2. In a patient with a contaminated wound, an attempt to remove the bandage for examining and treating the wound causes acute pain because it adheres to the surface of the wound. What concentration of hydrogen peroxide solution is used to facilitate removal of the dressing and to clean the wound of dirt and pus?

A. Sol. Hydrogenii peroxydi 33% B. Sol.Hydrogenii peroxydi 5%
C. * Sol. Hydrogenii peroxydi 3% D. So l.Hydrogenii peroxydi 10% E. -

3. Indicate the mechanism of antiseptic action of metal salts:

A. Protein denaturation B. Protein dehydration C Blockade of dehydrogenases
D. * Blockade of sulfhydryl groups of enzymes E. Pore formation in the membrane

4. For medical treatment of root canals with periodontitis, the dentist used sodium hypochlorite. What group of antiseptics by chemical structure does this remedy belong to?

A. Metals Group B. Oxidizing agents C. * Halogens D. Alcohols E. Detergents

5. To determine the quality of brushing, you can use:

A. Hydrogen peroxide B. Diamond green C. Ethyl alcohol
D. * A solution of iodine E. Silver nitrate

6. To reduce the toxic effects of silver nitrate on the oral mucosa, use:

A. * Sodium chloride B. Sodium sulfate C. Chloramine D. Chlorhexedine. E Hydrogen peroxide

7. A group of students went to collect medicinal plants outside the city. During the hot day, drinking water ran out. The team leader suggested using water from the pond, because he took with him pills to disinfect it. What is the drug in tablets?

A. * Pantocide B. Chloramine C. Chloric lime D. Potassium permanganate E. Hydroperite

8. Choose a drug for cauterizing erosion, excessive granulation and ulcers:

A. * Silver nitrate B. Ethacridine lactate C. Furatsilin D. Chloramine B E. Chlorhexidine

5. Materials for self-control.

5.1. Tasks for self-control.

Using textbooks and teaching aids, fill out the following tables:

Table No. 1. Fill in the table "Antimicrobial spectrum and the use of antiseptic and disinfectant substances":

	solution of iodine spiritus	hydrogen peroxide	potassium permanganate	chlorhexidine	silver nitrate
Antimicrobial spectrum					
Indications for use					

5.2. Tasks for self-control.

TASK 1. In a patient with a contaminated wound, a drug that has a cleansing and antiseptic effect was used to clean it of dirt and pus. When applied topically, this drug activates blood coagulation, and therefore can also be used to stop capillary bleeding.

A) Identify the drug.

B) Indicate the application in medical practice.

TASK 2. A patient with an infected wound was admitted to the trauma unit. Select an antiseptic from the halogen group to treat the surgical field and the edges of the wound.

A) Identify the drug.

B) Indicate indications for its use.

5.3. Tests for self-control.

1. The nurse prescribed by the doctor washed the wound with a 3% solution of hydrogen peroxide. This created a lot of foam. To the patient's question about the mechanism of this phenomenon, the nurse was not able to give an exhaustive answer and turned to the doctor for clarification. Determine the correct answer.

A. The formation of molecular oxygen as a result of the enzymatic destruction of hydrogen peroxide

B. The formation of atomic oxygen in the interaction of hydrogen peroxide with body tissues

C. Interaction of hydrogen peroxide with fibrinolysin and the release of molecular oxygen

D. Aggressive effect of hydrogen peroxide on body tissues with the release of molecular oxygen

E. Inactivation of organic matter

2. Long-term use of yellow mercury oxide has caused side effects and requires the use of which antidote?

A. Unithiol B. Adrenaline C. Urotropin D. Atropine E. Carbolen

3. When treated with hydrogen peroxide in the patient's oral mucosa, the blood stained brown instead of foaming. With a decrease in the concentration of which of these enzymes is this possible?

A. Pseudocholinesterase B. Glucose-6-phosphate dehydrogenase

C. Acetyltransferase D. Catalase E. Methemoglobin reductase

4. The patient went to the doctor with complaints of pustular rashes on the skin of the limbs. What antiseptic should be prescribed to the patient?

A. Alcohol iodine solution B. Insulin C. Prednisolone D. Sibazon E. Heparin

5. A 38-year-old man who was poisoned by sublimate was admitted to the emergency department in serious condition. What antidote is necessary to introduce?

A. Unithiol B. Dipiroksim C. Nalorfin D. Atropine E. Isonitrosine

6. A patient with poisoning by heavy metal salts was delivered to the toxicology department from chemical production. What antidote is needed in this situation?

A. Adsorbent B. M-anticholinergics C. Cholinesterase reagents

D. Analeptics E. Donor of CH groups

7. The patient turned to the emergency room about a purulent cut wound. To cleanse the wound from purulent discharge, the doctor washed it with a 3% hydrogen peroxide solution. No foam was formed. What is the reason for the lack of action of the drug?

A. Hereditary catalase deficiency B. Low concentration of hydrogen peroxide

C. Hereditary erythrocyte phosphate dehydrogenase deficiency

D. Shallow wound E. Presence of pus in the wound

8. The patient used a preparation to treat the burn surface of the skin, the antiseptic properties of which are provided by free oxygen, and is cleaved in the presence of organic substances. Choose the correct answer:

A. Potassium permanganate B. Furatsilin C. Chlorhexidine D. Boric acid

E. Sodium bicarbonate

9. The patient has a purulent wound. A solution was used that showed an antiseptic effect and contributed to the mechanical cleansing of the wound. What antiseptic was used?

A. Hydrogen peroxide B. Potassium permanganate C. Alcohol iodine solution

D. Ethacridine Lactate E. Brilliant Green

10. The patient has a purulent wound with necrotic contents. Which wound cleansing drug should be prescribed?

A. Hydrogen peroxide B. Etonius C. Furatsilin D. Iodinol E. Chlorhexidine

11. To treat the surgical field, the doctor used a 5% alcohol solution of iodine. What is the antiseptic mechanism of this agent?

A. Interacts with amino groups of proteins of microorganisms, causes protein denaturation

B. Dehydration of protoplasmic proteins C. Blockade of sulfhydryl enzymes

D. Albuminate formation E. Inhibitory effect on enzymes (dehydrogenases)

12. To treat the surgical field, the patient was treated with a drug that is chemically a dichlorvim derivative of biguanides. The most active local antiseptic, has a quick and strong bactericidal effect on gram-positive and gram-negative bacteria. What is this drug?

A. Chlorhexidine V. Yodditserin S. Chloramine D. Chlorophyllipt E. Etonius

13. For the treatment of hypergranulations, a preparation from the group of salts of heavy metals was used, it has a predominantly cauterizing effect. Identify this drug:

A. Bismuth subcitrate B. Silver nitrate C. Aluminum oxide D. Magnesium hydroxide

14. A patient with signs of acute morphine poisoning was admitted to the intensive care unit. What remedy should be used as an antidote for gastric lavage?

A. Potassium permanganate B. Sodium bicarbonate S. Furatsilin

D. Sodium chloride solution E. Boric acid

15. To reduce the toxic effect of iodine on the oral mucosa, use:

A. Slime of starch B. Slime of marshmallow S. Chloramine D. Chlorhexedine E Hydrogen peroxide

16. A patient with halogen aphthae was prescribed a drug whose active agent is halogen, as well as a surfactant that has a disinfecting and deodorizing effect. It is used to disinfect non-metallic instruments, hands, and objects for caring for infectious patients. As an antiseptic, it is used to treat infected wounds, the oral mucosa, pathological gingival pockets, and root canal disinfection. Identify the drug.

A. Potassium permanganate B. Chlorhexidine bigluconate C. Boric acid

D. Hydrogen peroxide E. Diamond green

17. A 5-year-old child was diagnosed with gingivitis. The dentist treated the affected area with a halogen antiseptic that has an antimicrobial, fungicidal effect. What is this medicine?

A. A solution of boric acid B. Protargol C. A solution of zinc sulfate

D. Solution of furazolidone E. Solution of alcohol iodine

18. The doctor diagnosed the patient with gingivitis and suggested rinsing his mouth with an agent from the group of oxidizing agents. Choose this tool:

A. Hydrogen peroxide B. Boric acid C. Salicylic acid D. Phenol
E. Diamond Green

19. The patient was treated with a 2% potassium permanganate solution to treat the burn surface. What pharmacological group does this preparation belong to?

A. Dye antiseptics B. Oxidizing antiseptics C. Halogen antiseptics
D. Antiseptics-alcohols E. Antiseptics-detergents

20. Determine the antiseptic, which is a halogen and a surfactant, is used to treat infected wounds, to disinfect non-metallic instruments, hands, patient care items:

A. Chlorophyllipt B. Decamethoxin C. Chloramine D. Chlorhexidine E Furacilin

21. A bed sore patient has bedsores. Which antiseptic from the group of oxidizing agents with a deodorizing effect should be used to treat wounds?

A. Potassium permanganate B. Hydrogen peroxide C. Phenol solution D. Iodicerin
E. Diamond Green

22. To prevent infection of small skin integrity lesions, a halogen-containing antiseptic was used, which has an irritating, distracting, fungicidal effect. What is this medicine?

A. Tannin solution B. Alcohol iodine solution C. Potassium permanganate solution
D. A solution of boric acid E. A solution of zinc sulfate

6. Practical tasks that are performed in class:

6.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

6.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration:

1. Antiseptic from the group of halogens for the treatment of hands.
2. Antiseptic from the halogen group for processing the surgical field.
3. Combined antiseptic from the halogen group.
4. Antiseptic from the group of oxidizing agents for washing purulent wounds, root canals.
5. An antiseptic from the group of oxidizing agents for whitening teeth.
6. Antiseptic for the treatment of burns.
7. Antiseptic from the group of oxidizing agents for gastric lavage.
8. Antiseptic - a surfactant for processing tools.
9. Antiseptic for cauterization of granulations.
10. Halogen-containing antiseptic detergent for rinsing the mouth.

6.3. Run experiments to draw conclusions:

Experience 1. Demonstration of solutions of potassium permanganate 5%, 1%, 0.1%, 0.01%.
Prepare solutions of the appropriate concentration, consider their color and explain the practical use of the drug in various concentrations.

Experience 2. Inactivation of sodium thiosulfate local action of iodine.
Lubricate the skin of the student volunteer with 5% alcohol iodine solution, note the nature of the color and subjective sensations. Next, a solution of iodine is treated with a sodium thiosulfate solution. Draw conclusions.

Experience 3. The interaction of salts of heavy metals with SH-groups of unitiol.
In tubes containing 1 ml of a 5% solution of unitiol, add 1 ml of solutions of salts of heavy metals (cobalt, zinc, lead, mercury). They observe changes in the color of the solutions or the appearance of a precipitate and draw conclusions about the role of SH-groups in the mechanism of action of heavy metal salts.

Content module 7	**Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs.**
To the topic № 11	**Antiseptic and disinfectant medicines (continued).**

1. Relevance of the topic: Medicines that have antimicrobial properties are divided into two groups. The first group: agents that adversely affect microorganisms and are not characterized by selectivity of action. These include antiseptics and disinfectants. The second group of substances contains antimicrobial agents of selective action, which relate to chemotherapeutic agents.

2. The educational goals:

1. To generalize and analyze the pharmacological characteristics of the main pharmacological agents, to explain the mechanisms of action.
2. Interpret indications for the use of disinfectants and antiseptics in accordance with the knowledge of pharmacodynamics.
3. Rate benefit / risk ratio when used basic groups disinfectants and antiseptics
4. Create an algorithm for helping patients with acute poisoning with phenol, formaldehyde.
Understand the possibility of using antidotes in each case.
5. Explain the dependence of the action of disinfectant and antiseptic drugs on the pharmacokinetics of patients of different ages, concomitant diseases and their therapy.
6. To make a judgment on the possibility of side effects when using disinfectants and antiseptics in order to prevent them.
7. Write out prescriptions and conduct pharmacotherapeutic analysis of the prescribed drugs from the group of disinfectant and antiseptic drugs.

3. Basic knowledge, skills that are necessary to study the topic (interdisciplinary integration):

Names of previous disciplines	Acquired skills
1. Latin	Have Prescription Writing Skills.
2. Microbiology	Use the necessary preparation based on the structural features of viruses, bacteria, and protozoa.
3. General surgery	Define the concept of antiseptics and disinfection. Choose the necessary disinfectant and antiseptic

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
Disinfectants	They are used to destroy microorganisms in the environment (processing tools, facilities, utensils, etc.).
Antiseptics	They are used to destroy microorganisms on the outer shells of a macroorganism (skin, mucous, wounds)
Chemotherapeutic agents	Selectively destroy pathogenic flora in the body
Bacteriostatic effect	The ability of the drug to temporarily stop the division and growth of microbes
Bactericidal action	The ability of the drug to destroy microbes

PREPARATIONS

№	**Name of the drug**	**Release form**	**Mode of application**
PHENOL groups			
1.	Resorcinol Resorcinum	Flak. 1%, 2%, 5% alcohol and aq. sol. Ointment 5% - 20%	Skin treatment Lubricate skin
2.	Phenol Pure Phenolum purum	Flak. 3 - 5%	For disinfection

3.	Ichthyol Ichthyolum	Ointment 10% 25 g Suppositories rect. 0.2 g	Lubricate skin In the rectum 0.2 g 2 r / day
4.	Thymol Thymolum	Powder. 1,0	In the form of 0.05-0.1% rinse for rinsing
DYES			
1	Diamond Green Viride nitens	Flak. 1% 10 ml alcohol. and aq. sol.	Lubricate around the wounds
2	Methylene blue	Flak. 1% alcohol and aq. sol.	Lubricate skin Intravenously
3	Methylenum coeruleum	Amp. 1% 20 and 50 ml	For washing cavities, skin treatment
NITROFURAN			
1	Furatsilin Furacilinum	Flak. 1: 1500 10 ml alcohol. sol.	Ear drops Dissolve 0.02 g in 100 ml of rinse water
2.	Furacilinum Furazolidonum	Tab. 0.02 g	Inside 0.1 g 4 times a day
ALDEHYDES and ALCOHOLUS			
1	Formaldehyde solutionFormaldehydum	Flak. 0.5% - 1% solution	Для дезинфекции, обработки кор./ каналов
2	Ethanol Spiritus aethylicus	Flak. 40%, 70%, 96% Flak. 20%, 30%	For compresses, hand treatment for surgeon, instruments Intravenously for inhalation
DETERGENTS			
1.	Etonius Aethonium	Flak. 0.02%, 1% solution Ointment 1% 15 g	For lubrication, flushing, application Lubricate the skin, mucous membranes
2.	Chlorhexidine bigluconate Chlorhexidinum bigluconas	Flak. 20% 500 ml Flak. 0.05% 100 ml	Dissolve in ethyl alcohol in a ratio of 1:40 for hand treatment to a surgeon For greasing, rinsing
3.	Decamethoxin Decamethoxinum	Flak. 0.02% solution Tab. 0.1 g	For disinfecting, rinsing Under the tongue 0.1 g 4-6 times a day
4.	MiramistinMyramistinum	Ointment 0.5% 15 g	Lubricate skin
HERBAL preparations			
1.	Chlorophyllipt Chlorophylliptum	Flak. 1% alcohol sol. Flak. 2% oil rr	Locally, applications
2.	Sanguirythrin Sanguiritrinum	Flak. 0.2% alcohol sol. 50 ml	Locally as a 0.2% solution and a dilution of 1:40 (0.005% solution)
3.	Evkalimin Eucalyminum	Flak. 1% solution 25ml	At a 1:10 dilution for splicing, rinsing, applications
4.	Periodontal disease Paradontocide	Flak. 25, 50 ml	For rinsing

4.2. Theoretical questions for the lesson:

1. Pharmacology of antiseptic and disinfectants of an organic nature. Aromatic derivatives (**phenol, resorcinol, thymol**). The mechanism of action of phenol group drugs. Side effects. Acute phenol poisoning, help.
2. The mechanism of action of nitrofuran derivatives (**furatsilin**, furazolidone), indications and contraindications for use. Comparative characteristics of drugs.
3. The mechanism of the antimicrobial action of dye preparations (**brilliant green, methylene blue, ethacridine lactate**). Pharmacological characteristics of drugs. Indications for use.

4. Antiseptics are derivatives of the aliphatic series. Pharmacokinetics, pharmacodynamics of **formaldehyde**. Side effect.
5. he mechanism of the antimicrobial action of **ethyl alcohol**, isopropyl alcohol.
6. Pharmacology of surfactants. The mechanism of action, indications for the use of detergents (**ethonia, decamethoxin, chlorhexidine bigluconate, miramistin**).
7. The use of antibacterial agents of plant origin: eucalyptus leaf extract, **chlorophyllipt**, eucalymin.

4.3. Practical tasks performed in preparation for the lesson:

4.3.1. Write down prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Furacilin in tablets.
2. Ethacridine Lactate
3. Brilliant green in bottles.
4. Ethyl alcohol for processing hands and disinfecting tools.
5. Chlorhexidine bigluconate in vials.
6. Etonius.
7. Chlorophyllipt.

4.3.2. Fill in the table:

Preparations	Mechanism of action	Indications for use.	Adverse reactions
1. Furacilin			
2. Ethacridine Lactate			
3. Diamond green			
4. Ethyl alcohol			
5. Chlorhexidine bigluconate			
6. Ethony			
7. Chlorophyllipt			

4.3.3. Solve test items:

1. Indicate an antiseptic that does NOT apply to a group of detergents:
A. Etonius B. Miramistin S. Decamethoxin D. Chlorhexidine E. * Formalin

2. Formaldehyde is used as a preservative for anatomical preparations. What group in chemical structure does this antiseptic agent belong to?
A. * Aliphatic agents B. Aromatic agents C. Alcohols
D. Halogens E. Detergents

3. Determine the antiseptic - the product of the polymerization of formaldehyde, used in dentistry for necrotization of the pulp of the tooth as part of devitalizing pastes.
A. Resorcinol B. Ethanol C. Phenol D. * Paraformaldehyde E. Thymol

4. For washing the pleural cavity, a drug from the group of dyes was prescribed. Define it.
A. Furacilin B. * Ethacridine lactate C. Ethyl alcohol D. Iodine solution
E. Methylene blue

5. Indicate a disinfectant that penetrates well through the skin and can cause poisoning with a picture of the CNS lesion (suppression).
A. Hydrogen peroxide B. Decamethoxin C. Furatsilin D. * Phenol E. Potassium permanganate

6. Identify the antiseptic that belongs to the nitrofuran group.
A. Rezorcin B. Formalin C. Phenol D. * Furatsilin E. Miramistin

7. To the patient with ulcerative lesions of the oral mucosa, the dentist prescribed an antiseptic from the group of dyes, which has a bactericidal and fungicidal effect. Sometimes this remedy is used as an antidote for those poisoned by cyanides, nitrates. Determine with the drug:
A. Furacilin B. Ethacridine lactate C. Ethyl alcohol D. Iodine solution
E. * Methylene blue

8. Under what conditions does the activity of brilliant green increase?

A. Acidic environment B. * Alkaline environment

C. Environment with organic matter D. Aquatic environment

E. Combination with sulfonamides

9. For filling the root canals of the upper molars, the doctor used a paste containing 2 antiseptics with a mummifying effect

A. Camphor-phenolic mixture B. Phenol-formaldehyde mixture

C. A paste of arsenic acid D. Pasta etazol-anestezinova

E. * Resorcinol-formalin paste

10. Indicate an antiseptic that DOES NOT APPLY to the phenol group:

A. Phenol B. Thymol S. Resorcinol D. Tar birch E. * Formalin

5. Materials for self-control.

*5.1. Tasks for self-control***.**

Using textbooks and teaching aids, fill out the following tables:

Fill in the table "Antimicrobial spectrum and the use of antiseptic and disinfectant substances"

	furatsilin	phenol	formaldehyde	brilliant green	etonium
Antimicrobial spectrum					
Indications for use					

5.2. Tasks for self-control.

TASK 1. The drug from the group of nitrofurans, with respect to most grams of negative (Escherichia coli, Salmonella, Shigella, Proteus, etc.) and some gram-positive (streptococci, staphylococci) bacteria, also has anti-trichomonas and anti-giardic activity.

A) Identify the drug.

B) Indicate indications for its use.

5.3. Tests for self-control.

1. The surgeon used a 70% solution of ethyl alcohol to treat the hands before surgery. What is the main mechanism of the antiseptic effect of the drug?

A. Dehydration and denaturation of protoplasmic proteins of microorganisms

B. Blockade of sulfhydryl groups of enzyme systems of microorganisms

C. Violation of the permeability of the cell wall of microorganisms

D. Interaction with the amino groups of the proteins of the protoplasm of microorganisms

E. Inhibition of microorganism enzymes (dehydrogenases)

2. Note the concentration of ethyl alcohol that has the most active antimicrobial activity in the presence of protein in the medium:

A. 70% B. 15% C. 40% D. 60% E. 96%

3. To treat the surgical field, the patient was treated with a drug that is chemically a dichloro-containing derivative of biguanides. The most active antiseptic, has a quick and strong bactericidal effect on gram-positive and gram-negative bacteria. What is this drug?

A. Chlorhexidine V. Yodditserin S. Chloramine D. Chlorophyllipt E. Etonius

4. For a patient with catarrhal gingivitis, the doctor prescribed an antiseptic agent of plant origin. What is this drug?

A. Chlorophyllipt B. Decamethoxin C. Chloramine D. Chlorhexedine E Furacilin

5. For a patient with ulcerative necrotic gingivitis, the doctor prescribed a plant-derived antiseptic chlorophyllipt. What is the source of its receipt?

A. Sage leaves B. Eucalyptus leaves C. Mokle grass D. St. John's wort grass E Chamomile flowers

6. For emergency prevention of sexually transmitted diseases, the detergent Miramistin is used. Indicate its antiseptic mechanism:

A. Protein denaturation B. Protein dehydration C Blockade of dehydrogenases
D. Blockade of sulfhydryl groups of enzymes
E. Violation of the permeability of the membrane of the microbial cell

7. A patient with halogen aphthae was prescribed a drug whose active agent is halogen, as well as a surfactant that has a disinfecting and deodorizing effect. It is used to disinfect non-metallic instruments, hands, and objects for caring for infectious patients. As an antiseptic, it is used to treat infected wounds, the oral mucosa, pathological gingival pockets, and root canal disinfection. Identify the drug.

A. Potassium permanganate B. Chlorhexidine bigluconate C. Boric acid
D. Hydrogen peroxide E. Diamond green

8. A 46-year-old patient is in the urology department due to exacerbation of chronic cystitis. Which antiseptic can be used to rinse the bladder?

A. Furatsilin B. Diamond green C. Hydrogen peroxide
D. Co-trimoxazole E. Alcohol iodine solution

9. The mechanism of action of antiseptics of which group is a violation of the permeability of the cell membrane of microorganisms due to changes in surface tension?

A. Metals group B. Oxidizing agents C. Acids D. Alcohols E. Detergents

10. To treat the burn surface, an antiseptic solution is prescribed, which is also used as an antidote for poisoning with methemoglobin-forming poisons, cyanides. What drug is prescribed?

A. Silver nitrate B. Ethacridine lactate C. Ethyl alcohol D. Methylene blue
E. Potassium permanganate

11. For the purpose of suicide, a woman drank about 40 ml of formaldehyde, which was intended to treat the skin with excessive sweating (after appropriate dilution). What antidote drug should you rinse your stomach with?

A. A solution of tannin B. A solution of ammonia C. A solution of potassium permanganate
D. A solution of unithiol E. A solution of sodium chloride

12. Identify a drug that exhibits antiseptic, disinfectant, irritant, and antidote effects in methanol poisoning:

A. Formalin B. Ammonia solution C. Ethyl alcohol D. Iodine solution

13. Determine the antiseptic, which is a halogen and a surfactant, is used to treat infected wounds, to disinfect non-metallic instruments, hands, patient care items:

A. Chlorophyllipt B. Decamethoxin C. Chloramine D. Chlorhexidine E Furacilin

6. During the lesson the student must:

6.1. *Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.*

6.2. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

1. An antiseptic from the group of dyes for washing a purulent wound.
2. A drug from the group of dyes for the treatment of pyoderma.
3. A drug from the group of nitrofurans for gargling with angina.
4. Antiseptic - a surfactant for processing tools.
5. Ethyl alcohol for disinfection of surgical instruments.
6. Ethyl alcohol for the treatment of the surgeon's hands.
7. Antiseptic - detergent, has a local anesthetic, regenerative effect.
8. Antiseptics of plant origin.

6.3. Instruction to the experimental work:

Experiment 1. The effect of phenol on protein

In two tubes with a protein solution, add in the first - 5 drops of a 2% aqueous solution of phenol, in the second - 5 drops of a 2% oil solution of phenol. Make wok hangs.

Content module № 7	**Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs**
To the topic № 12	**Synthetic antimicrobial agents. Fluoroquinolones. Antimycotics.**

1. Relevance of the topic: Synthetic antimicrobials are important for the treatment and prevention of infectious diseases. These include sulfonamides, nitrofurans, nitroimidazoles, quinolones, fluoroquinolones and antimicrobials with different chemical structures. Preparations of these groups can be an alternative for the treatment of diseases caused by antibiotic-resistant microorganisms. The relevance of studying the pharmacology of antifungal agents is due to the fact that pathogenic and conditionally pathogenic fungi and the diseases caused by them (mycoses) are widespread.

2. The educational goals:

1. To summarize and analyze the main characteristics of fluoroquinolones, sulfonamides, antifungal agents.
2. Interpret modern classifications of therapeutic agents that are used to treat diseases caused by pathogenic pathogens.
3. Summarize and analyze the pharmacological characteristics of fluoroquinolones, sulfonamides, antifungal agents, explain the mechanism of action.
4. To assess the ratio of benefits and risks when using fluoroquinolones and other synthetic chemotherapeutic agents, antifungal agents. Predict and prevent side effects
5. Prescribe and conduct a pharmacotherapeutic analysis of drugs from the group of fluoroquinolones, sulfonamides and antifungal agents.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Latin	Own prescription skills.
2. Microbiology	Apply knowledge regarding the classification of bacteria, fungi and their biological properties.
3. Biological chemistry	Describe the biochemistry of the mechanisms of antibacterial action.

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
1. Fluoroquinolones	Synthetic antibacterial agents, derivatives of quinolones of the 3rd generation
2. Sulfanilamides	Synthetic chemotherapeutic agents derived from sulfanilic acid
3. Antimycotic agents (antifungal)	Drugs that can be used to treat fungal diseases of different localization
3. Antimicrobial spectrum	The list of microorganisms that are sensitive to the action of this antibiotic.
4. Chemotherapeutic spectrum	The list of diseases in which this antibiotic can be used.

PREPARATIONS

№	Name of the drug	Release form	Mode of application
QUINOLONES. FLUOROQINOLONES			
1.	Nitroxoline Nitroxolinum	Tab. 0.05 g	Inside 0.1 g 4 times a day
2.	Nalidixic Acid Acidum nalidixicum	Tab. 0.5 g Caps. 0.5 g	Inside 0.5 g 4 times a day
3.	Ciprofloxacin Ciprofloxacinum	Tab. 0.5 g Amp. 1% 10ml	Inside 0.5 g 2 times a day Intravenously 0.1-0.2g 2 r / day

4.	Ofloxacin Ofloxacin	Tab. 0.2, 0.4 g Flak. 0.2% 100ml	Inside 0.2-0.4 g 2 times a day Intravenously 0.2-0.4 g 1-2 r / day
5.	Levofloxacin Levofloxacinum	Tab. 0.25, 0.5 g Flak. 0.5% 100ml	Inside 0.5 g 1-2 times / day Intravenously 0.5 g 2 times / day
NITROFURANES			
1.	Furazolidone Furazolidonum	Tab. 0.05 g	Inside 0.1 g 4 times a day
2.	Nitrofurantoin Furadonin Furadonin	Tab. 0.1 g	Inside 0.1 g 4-2 times a day
3.	Nifuroxazide Nifuroxazide	Tab. 0.1 g	Inside 0.2g 4 times / day
SULFANILAMIDES			
1.	Sulfadimezin Sulfadimezinum	Tab. 0.05 g	The first dose (loading dose) is 2 g, then 1 g after 4-6 hours
2.	Sulfacyl sodium Sulfacylum – natrium	Underestimated. powder Eye drops 30% 10 ml	Powder on the wound 2 cap. 5-6 times / day in each eye
3.	Phthalazole Phthalazolum	Tab. 0.5 g	Inside 1 g 4 times a day
4.	Sulfadimethoxin Sulfadimethoxinum	Tab. 0.5 g	The first day is 1-2 g, the following days are 0.5-1 g 1 time per day
5.	Sulfapyridazine Sulfapyridazinum	Tab. 0.5 g	The first day is 1-2 g, the following days - 0.5-1 g 1 time per day
6.	Sulfalen Sulfalenum	Tab. 0.2 g	The first day is 1 g (5tables), the following days - 0.2 g once a day
7.	Co-trimoxazole Co-Trimoxazole (Biseptolum, Bactrim)	Tab. (480mg, 960mg)	Inside 2 tab. (960 mg) 2 times a day
8.	Salazopyridazine Salazopyridazinum	Tab. 0.5 g Suppositories Rect. 0.5 g	Inside 0.5 g 4 times a day In the rectum 0.5 g 2-4 r / day
NITROIMIDAZOLE			
1.	Метронидазол Metronidazolum	Табл. 0,25 г Флак. 0,5% 100 мл Суппозит. ваг. 0,1г	Inside 0.25 g 3 times per day Intravenously 100 ml slowly for 20-30 minutes. every 8 hours In the vagina 0.1 g
ANTIFUNGIC PRODUCTS			
1.	Nystatin Nystatinum	Tab. 500,000 units Suppository rect. 500,000 units Ointment 10g (1.0-1000000ED)	Inside 500000ED 4 times / day In the rectum 500000ED 2 r / day Apply to the affected surface 2 times a day
2.	Amphotericin B Amphotericinum B	Flak. 50,000 Ointment (1.0-30000ED)	In a vein drip for 4-6 hours, dissolving glucose in 5% solution Lubricate affected skin
3.	Griseofulvin Griseofulvinum	Tab. 0.125 g	Inside 0.125 g 4 times a day
4.	Clotrimazole Clotrimazolum	Cream 1% 20 g Ointment 1%	Apply on the affected surface 2-3 times a day

5.	Ketoconazole Ketoconazole	Tab. 0.2g Ointment, cream 2% 15g	Inside 0.2-0.4 g per day Apply on the affected surface 2-3 times a day
6.	Miconazole Miconazole	Tab. 0.25 g Cream 2% for 15 g	Middle 0.25g 4 times per dob On a fenced surface 2 r / day
7.	Fluconazole Fluconazole	Caps. 0.05; 0.1; 0.15 g Tab. 0.05; 0.1; 0.15 g Flak. 0.2% 100ml	Inside 0.05 g per day 0.2-0.4 g per day drip into a vein
8.	Itraconazole Itraconazolum	Tab. 0.1 g Caps. 0.1 g	Inside 0.1-0.2 g 1-2 times a day
9.	Terbinafine Terbinafine	Tab. 0.25 g Cream 1% 15g	Inside 0.125-0.25 g per day Apply to affected area

4.2. Theoretical questions for the lesson:

1. The principles of chemotherapy. The difference between antimicrobial and chemotherapeutic spectra of action.
2. Classification of antimicrobial agents of different chemical structures.
3. Classification of sulfonamides according to the duration of action and the characteristics of pharmacokinetics. Pharmacology of short-acting sulfanilamides (sulfadimesin, sulfacyl sodium, phthalazole), long-acting (sulfadimethoxine, sulfapyridazine, sulfalene).
4. Pharmacokinatics and pharmacodynamics of sulfonamides. Spectrum of antimicrobial action. Indications for use. Side effect and its prevention.
5. Pharmacology of combined sulfa drugs with trimethoprim (co-trimoxazole).
6. Derivatives of quinolone I-IV generation. Classification, mechanism of action, indications, side effects. Characterization of drugs (nitroxoline, nalidixic acid). Features of the use of fluoroquinolone derivatives (ofloxacin, ciprofloxacin, levofloxacin, moxifloxacin) in medical practice.
7. Derivatives of nitrofuran. The mechanism of action, indications, routes of administration, side effects (furatsilin, furazolidone, furagin, nifuroxazide, nitrofuranto (furadonin)).
8. Synthetic antimicrobial drugs of different chemical structures hydroxymethylquinoxalindioxide (dioxidine), dioxisole, metronidazole).
9. Antifungal (antimycotic) drugs Classification of antifungal agents by origin and use. Pharmacokinetics, pharmacodynamics of polyenes (nystatin, levorin, amphotericin B, natamycin (pimafucin)), azoles (clotrimazole, ketoconazole, miconazole, itraconazole, fluconazole), alilamines (terbinafine (lamisil)). Antifungal agents of different chemical groups (dequalinium chloride (decathylene, lizak)). Indications, side effect.

4.3. Practical exercises that are performed in class:

4.3.1. Write down the prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Ciprofloxacin tablets and ampoules
2. Furazolidone tablets
3. Metronidazole tablets, suppositories
4. Sulfacyl sodium in eye drops
5. Phthalazole tablets
6. Sulfadimethoxine tablets
7. Co-trimoxazole tablets
8. Nystatin tablets, suppositories, ointments
9. Amphotericin B in vials
10. Ketoconazole tablets, ointments
11. Fluconazole tablets

4.3.2. Fill in the table:

Preparations	Mechanism of action	Indications for use.	Adverse reactions
Ciprofloxacin			
Furazolidone tablets			
Metronidazole			
Sulfacyl sodium			
Phthalazole			
Sulfadimethoxin			
Co-trimoxazole			
Nystatin			
Amphotericin B			
Ketoconazole			
Fluconazole			

4.3.3. Solve test items:

1. Determine the short-acting sulfanilamide preparation:
A. Sulfadimethoxin B. Co-trimoxazole C. * Phthalazole D. Sulfalen E. Sulfapyridazine

2. Determine the sulfonamide drug, which is used for local action:
A. Biseptol B. Sulfadimethoxin S. Sulfalen D. Phthalazole E. * Sulfacyl sodium

3. To determine the derivative of 8-hydroxyquinoline, which is well absorbed in the gastrointestinal tract:
A. Nevigramon B. Furazolidone C. * Nitroxoline D. Ciprofloxacin E. Amphotericin

4. Determine the long-acting sulfonamide preparation:
A. * Sulfapyridazine B. Sulfalen C. Phthalazole D. Sulfacyl-sodium E. Sulfadimezin

5. Specify a drug for the local treatment of dermatomycosis:
A. Griseofulvin V. Nystatin (tab.) C. * Clotrimazole D. Amphotericin (fl.) E. Itraconazole

6. Which drug belongs to the group of fluoroquinolones:
A. Furazolidone B. Nalidixic acid C. Nitroxoline D. * Ciprofloxacin E. Linezolid

7. Indicate the antifungal antibiotic derivative of polyenes:
A. Itraconazole B. Nitroxoline S. Griseofulvin D. * Nystatin E. Fluconazole

8. Which scientist has the priority of introducing sulfonamides in the clinic:
A. Gelmo V. * Domagk S. Nelyubin D. Kravkov E. Fleming

9. Furazolidone sensitizes the body to ethyl alcohol, which blocks the enzyme:
A. Acetaldehyde hydrogenase B. *Alcohol dehydrogenase C. Folate reductase D. MAO
E. Cholinesterase

5. Materials for self-control.

5.1. Tasks for self-control

Using textbooks and teaching aids, fill out the following tables:
Fill in the table where to indicate the names of drugs of the respective groups and their duration.

Group	Drug Names	Duration of action
1. Short action 2. Average action 3. Long acting 4. Super long acting		

5.2. Tasks for self-control.

TASK 1. A patient suffering from acute bronchopneumonia is prescribed a combined sulfa drug containing sulfamethoxazole and trimethoprim.

A) Identify the drug. B) Dosage regimen.
C) What are the synonyms of the drug.

TASK 2. Range of action - gram-negative bacteria. The antimicrobial mechanism is associated with DNA suppression. It is used to treat urinary tract infections. Addiction quickly develops to it.

A) Determine the drug and its chemical origin. B) Side effects.

5.3. Tests for self-control.

1. A patient from stomatitis is prescribed a drug from the group of sulfonamides. What is the mechanism of its antibacterial action?

A. Inhibition of sulfhydryl groups of thiol enzymes B. Protein coagulation
C. Competitive antagonism with PABA D. Impaired cell wall protein synthesis
E. Decrease in membrane permeability

2. For the treatment of certain infectious diseases caused by bacteria, sulfonamide drugs are used that block the synthesis of bacterial growth factor. What is the mechanism of action of these drugs?

A. Are allosteric enzymes
B. Are para-aminobenzoic acid anti-vitamins C. Are allosteric enzyme inhibitors
D. Participate in redox processes E. Inhibit Folic Acid Absorption

3. An AIDS patient has diarrhea of bacterial origin. According to the results of a microbiological study, he was prescribed co-trimoxazole (biseptol, bactrim). What type (character) of antimicrobial action does this drug have?

A. Bactericidal B. Bacteriostatic C. Fungicidal D. Fungistatic E. Virulostatic

4. For the treatment of a patient with pneumonia, a combined preparation from the group of sulfonamides of a bactericidal type of action is prescribed. What drug was prescribed to the patient?

A. Co-trimoxazole B. Ethazole C. Norsulfazole D. Sulfalen E. Phthalazole

5. For a patient with angina, the doctor prescribed biseptol. What is the advantage of biseptol over other sulfonamides?

A. Trimethoprim blocks another phase of folic acid conversion
B. Trimethoprim enhances the imitation of PABA with sulfonamide.
C. Better penetrates the microorganism D. Reduces the biotransformation of sulfonamide
E. Decreases binding to blood proteins

6. What combination drug from the sulfonamide group has a high bactericidal effect?

A. Phthalazole B. Bactrim S. Sulfadimezin D. Salazopyridazine E. Etazol

7. If sulfonamides are metabolized by conjugation with acetic acid, then how is it necessary to change the reaction of urine to accelerate the excretion of these drugs by the kidneys?

A. Acidify B. Alkalize C. Do not change D. Convert to neutral
E. Urine response does not affect excretion

8. For a patient with a bacterial infection, the doctor prescribed sulfadimezin in tablets, recommending to drink 1.5-2 liters of alkaline mineral water daily. What is the conditional need for this recommendation?

A. For the prevention of crystallization of acetyl derivatives of the drug in the kidneys
B. To neutralize gastric acid C. To shift the pH of the blood to the alkaline side
D. To reduce stomach irritation E. To prolong the action

9. What indicator indicates the negative consequences of the intensive process of acetylation in sulfonamides?

A. Crystalluria B. Leukopenia C. Thrombocytopenia D. Agranulocytosis E. Cholestasis

10. If a patient needs to prescribe sulfonamides, then what is mandatory for the implementation of their antimicrobial mechanism?

A. Shock dose B. Alkalization of the body C. Individual dose
D. Prescribing Vitamin E. Prevention of Crystalluria

11. The patient underwent appendectomy under anesthesia with novocaine. Efficiency, which remedy will sharply decrease with compatible use with this anesthetic?

A. Sulfadimezin B. Streptomycin C. Tetracycline D. Ampicillin E. Erythromycin

12. A pathogenic microflora was found in a patient in periodontal pockets. The dentist prescribed a chemotherapeutic agent - an imidazole derivative. What is this drug?

A. Metronidazole B. Acyclovir S. Furazolidone D. Fluconazole E. Methyluracil

13. A 30-year-old patient went to the doctor with complaints of diarrhea and abdominal pain for 5 days, an increase in body temperature to 37.50 ° C with chills. The day before, the patient was in the forest, where he drank water from an open reservoir. Laboratory diagnosis: amoebic dysentery. Indicate the drug of choice for the treatment of this disease nitroimidazole derivative.

A. Metronidazole B. Phthalazole S. Furazolidone D. Levomycetin

E. Emetina hydrochloride

14. У 52-year-old men were diagnosed with systemic amoebiasis with damage to the intestines, liver, and lungs. What drug should be prescribed?

A. Tetracycline B. Ciniophon C. Metronidazole D. Chingamine E. Biseptol

15. A 45-year-old stomach ulcer patient is prescribed a drug based on the action of which has an antimicrobial effect. What is this drug?

A. Metronidazole B. Bisacodyl S. Omeprazole D. Ditilin E. Phthalazole

16. The patient has gingivitis due to anaerobic infection. What group of antimicrobials should be prescribed for treatment?

A. Nitrofurans B. Nitroimidazoles C. Sulfanilamides D. Aminoglycosides E. Polymyxins

17. A patient with gastric ulcer was prescribed an etiotropic therapy to inhibit the growth and reproduction of H. pylori. Name this drug:

A. Metronidazole B. Glauvent C. Prazosin D. Korglikon E. Furosemide

18. The patient turned to the dentist with complaints of purulent inflammation of the gums. What drug will be most effective if the anaerobic nature of the pathogen is assumed?

A. Co-trimoxazole B. Gentamicin C. Oxacillin D. Metronidazole E. Nitroxoline

19. The patient consulted a doctor with complaints of intestinal dysfunction. The doctor noted the symptoms of duodenitis, enteritis. In a laboratory study, the diagnosis was made: giardiasis. What drug is indicated for use?

A. Metronidazole B. Erythromycin C. Monomycin D. Khingamin E. Tetracycline

20. During the course of treatment with metronidazole, the patient consumed an alcoholic drink, as a result of which poisoning occurred. What is the cause of this adverse reaction?

A. Accumulation of acetaldehyde B. Allergic reaction C. Neurological disorders

D. Cardiovascular failure E. Impaired renal function

21. To the patient who takes furazolidone, the doctor recommended not to drink alcoholic beverages. What is the possible effect of the drug?

A. Teturam-like B. Papaver-like C. Caffeine-like D. Morphine-like E. Clonidine-like

22. Furazolidone sensitizes the body to ethyl alcohol because it blocks the enzyme:

A. Acetaldehyde hydrogenase B. Alcohol dehydrogenase C. Folate reductase

D. Monoamine oxidase E. Cholinesterase

23. The patient revealed gonorrhea according to bacterioscopy of a smear from the urethra. Prescribe an antimicrobial drug from the group of fluoroquinolones for the treatment of gonorrhea.

A. Cefazolin B. Urosulfan C. Tsefpir D. Ampicillin E. Ciprofloxacin

24. A patient with acute cystitis was prescribed a highly active antimicrobial agent derivative of fluoroquinolone. It exhibits a bactericidal effect on a relatively wide range of microorganisms. The mechanism of action is associated with inhibition of the subunit of the DNA gyrase enzyme. The tool adversely affects cartilage. What is this drug?

A. Bicillin-1 B. Sulfadimethoxin C. Ciprofloxacin D. Levomycetin E. Cefazolin

25. For the treatment of bronchitis, a child of 8 years old must be prescribed an antibacterial agent. Which of these drugs from the group of fluoroquinolones is contraindicated at this age?

A. Ciprofloxacin B. Amoxicillin C. Ampiox D. Sulfadimethoxin E. Ampicillin

26. Indicate the drug for the treatment of candidiasis, which arose after taking antibiotics.

A. Fluconazole B. Rifampicin C. Furazolidone D. Remantadin E. Phthalazole

27. A patient who took tetracycline for a long time was diagnosed with candidiasis of the oral mucosa. What drug should be prescribed for effective treatment?

A. Itraconazole B. Biseptol C. Terbinafine D. Griseofulvin E. Furadonin

28. A woman who had been taking antibiotics for intestinal infections for a long time developed an complication of the oral mucosa in the form of an inflammatory process and white plaque, in which yeast-like fungi Candida albicans were found during bacteriological examination. Which of the following drugs is indicated for the treatment of this complication?

A. Furazolidone B. Polymyxin C. Fluconazole D. Tetracycline E. Biseptol

29. A woman who has been taking antibiotics for intestinal infections for a long time has developed stomatitis caused by yeast-like fungi. Which of the following drugs can be used to treat this complication?

A. Ketoconazole B. Co-trimoxazole C. Furazolidone D. Nitroxoline

E. Nevigramon

30. The patient is diagnosed with candidal glossitis. What means of etiotropic therapy should be prescribed from the group of polyene antibiotics:

A. Interferon B. Metronidazole S. Tetracycline D. Furatsilin E. Nystatin

31. A patient consulted a dermatologist with complaints of the appearance of yellow spots on the toenails, deformation and destruction of the nails of the second and fifth fingers. Diagnosed with onychomycosis. What drug should be prescribed in this case?

A. Amphotericin B. Decamin C. Terbinafine D. Nystatin E. Levorin

32. Indicate the antifungal antibiotic derivative of polyenes:

A. Itraconazole B. Nitroxoline S. Griseofulvin D. Nystatin E. Fluconazole

33. An antibacterial agent with a wide spectrum of action, which also acts on some fungi. It is rapidly absorbed in the intestine and excreted unchanged. Used for chronic cystitis, pyelonephritis, prostatitis, stains urine in a bright yellow color.

A. Furazolidone B. Nalidixic acid C. Nitroxoline D. Ciprofloxacin E. Biseptol

34. During the use of nitrofurans, it is recommended to exclude foods containing the tyrosine amino acid from the diet in order to prevent the occurrence of arterial hypertension and tachyarrhythmia that the drugs block the enzyme:

A. Acetaldehyde hydrogenase B. Alcohol dehydrogenase C. Folate reductase D. MAO

E. Cholinesterase

35. The patient underwent appendectomy under anesthesia with novocaine. Is the effectiveness of any agent drastically reduced when used together with this anesthetic?

A. Sulfadimezin B. Streptomycin C. Tetracycline D. Ampicillin E. Erythromycin

36. What indicator indicates the negative consequences of the intensive process of acetylation in sulfonamides?

A. Crystalluria B. Leukopenia C. Thrombocytopenia D. Agranulocytosis E. Cholestasis

6. Practical tasks that are performed in class:

6.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

6.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration:

1. Short-acting sulfanilamide.
2. Sulfanilamide agent derived from phthalic acid.
3. Sulfanilamide agent in solution.
4. Sulfanilamide agent of long action.
5. Inhibitor of dihydrofolate reductase with sulfanilamide (in a combined preparation).
6. A chemotherapeutic agent is a derivative of nitrofuran.
7. A chemotherapeutic agent from the group of fluoroquinolones.
8. Means for fungal infections of the skin, hair, nails.
9. Means for the treatment of generalized mycoses.
10. A remedy for the treatment of candidal dermatitis (in ointment).
11. An imidazole derivative for the treatment of dermatomycosis.
12. Sulfanilamide bactericidal action.

6.3. Experimental work:

Experience 1. *The analysis of the solubility of sulfonamides.*

0.1 norsulfazole, phthalazole, sodium sulfacyl are placed in three test tubes and 2-3 ml of distilled water are poured. Then, in a test tube where complete dissolution has not occurred, a small amount of 10% sodium hydroxide solution is added. Observe the solubility of the compounds.

13. If a patient needs to prescribe sulfonamides, what is mandatory for the implementation of their antimicrobial mechanism?

A. Shock dose B. Alkalization of the body C. Individual dose

D. Prescribing Vitamin E. Prevention of Crystalluria

14. Patients resistant to trimethoprim resistant Salmonella typhi are seeded. What synthetic chemotherapeutic agent is the choice in this case?

A. Biseptol B. Ciprofloxacin C. Amoxicillin D. Cefotaxime E. Amikacin

15. The spectrum of the synthetic antimicrobial agent is gram-negative bacteria. The antimicrobial mechanism is associated with DNA suppression. It is used to treat urinary tract infections. Addiction quickly develops to it. Identify the drug:

A. Furazolidone B. Nalidixic acid C. Nitroxoline D. CiprofloxacinE. Метронидазол

16. An antibacterial agent with a wide spectrum of action, which also acts on some fungi. It is rapidly absorbed in the intestine and excreted unchanged. Used for chronic cystitis, pyelonephritis, prostatitis, stains urine in a bright yellow color.

A. Furazolidone B. Nalidixic acid C. Nitroxoline D. Ciprofloxacin E. Biseptol

17. A 30-year-old patient went to the doctor with complaints of diarrhea and abdominal pain for 5 days, an increase in body temperature to 37.5 ° C with chills. The day before, the patient was in the forest, where he drank water from an open source. The established bacteriologically confirmed diagnosis: amoebic dysentery. Specify the drug of choice nitroimidazole derivative for the treatment of this disease?

A. Metronidazole B. Furazolidone S. Levomycetin D. Phthalazole

E. Emethine hydrochloride

Content module № 7	**Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs.**
To the topic № 13	**Pharmacology of antibiotics.**

1. Relevance of the topic: Antibiotics are among the most vital chemotherapeutic drugs. Thanks to them, it became possible to recover patients with pulmonary plague, the mortality rate for diseases such as typhoid and rash, meningitis, tuberculosis, etc., sharply decreased.
Excessive enthusiasm for this group of chemotherapeutic agents and underestimation of their potential threat, irrational and ineffective use caused a number of undesirable consequences of antibiotic therapy - an increase in antibiotic resistance and multiresistance of microbes and their selection, damage to some organs and systems, the development of nonspecific sensitization, an increase in the frequency of endogenous, mixed infections, and superinfection. The above facts justify the need for more careful use of antibiotics and strict adherence to the basic principles of rational antibiotic therapy.

2. The educational goals:
1. Summarize and analyze the main characteristics of beta-lactam antibiotics.
2. Interpret indications for the use of beta-lactam antibiotics in accordance with the knowledge of pharmacodynamics.
3. Assess the benefit / risk ratio when using beta-lactam antibiotics.
4. To be able to choose and justify the optimal antibiotic for various pathologies.
5. Create a rational combination of antibiotics for various diseases and be able to justify it theoretically.
6. Write down recipes and conduct pharmacotherapeutic analysis of drugs from the group of beta-lactam antibiotics.

Be able to: Write down and analyze recipes for drugs from the group of beta-lactam antibiotics.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Latin	Own prescription skills.
2. Microbiology	Apply knowledge on the classification of bacteria and their biological properties.
3. Biological chemistry	Describe the biochemistry of the mechanisms of antibacterial action.

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
1. Antibiosis	“Life versus life” - L. Pasteur suggested. Substances that realize antibiosis are called antibiotics.
2. Antibiotics	Life products (or their synthetic analogues and homologs) of living cells, selectively inhibiting the functioning of other cells - microorganisms, tumor cells, etc.
3. Antibacterial spectrum	List of microorganisms that are sensitive to the action of this antibiotic.
4. Chemotherapeutic spectrum	The list of diseases in which this antibiotic can be used.

PREPARATIONS

№	**Name of the drug**	**Release form**	**Mode of application**

Penicillins			
1.	Benzylpenicillin sodium salt Benzylpenicillinum-natrium	Flak. 500,000, 1,000,000	Intramuscular injection of 500,000-1000000 units every 4 hours, after dissolving the contents of the vial in 5-10 ml of water for injection
2.	Bicillin-3 Bicillinum-3	Flak. 600,000	Intramuscular 600,000 units once a week, after dissolving the contents of the vial in 6 ml of water for injection
3.	Bicillin 5 Bicillinum-5	Flak. 15000000	Intramuscular 1500000 IU once every 4 weeks, after dissolving the contents of the vial in 10 ml / injection
4.	Oxacillin Sodium SaltOxacillini - natrium	Tab. 0.25, 0.5 g Flak. 0.25, 0.5 g	Inside 0.5 g 4 times a day 1 hour before or after meals Intramuscular 0.25-0.5 g every 6 hours, after dissolving the contents of the vial in 5 ml of water for injection
5.	Ampicillin TrihydrateAmpicillinи trihydras	Tab. 0.25, 0.5 g Flak. 0.25, 0.5 g	Inside, 5g 4 times a day 1 hour before or after meals
6.	Ampicillin sodium saltAmpicillinи natrии	Flak. 0.5, 1.0 g	Intramuscular 0.5 g every 6 hours, after dissolving the contents of the vial in 5 ml of water for injection
7.	Amoxicillin Amoxicillinum	Tab. 0.25, 0.5 g Caps. 0.25, 0.5 g Flak. 0.5 g	Inside 0.5 g 3 times a day Intramuscular 0.5 g every 6 hours, after dissolving the contents of the vial in 2 ml of water for injection
8.	AmoxiclavAmoxiclav	Caps. 0.375, 0.625 g Flak. 100 ml (suspension for oral administration) Flak. 0.6, 1.2 g	Inside 0.325-0.625g 2-3 times a day Inside, 1 scoop 3 times a day. To prepare the suspension, the vial must be shaken well, then add water to the vial in 2 doses, each time thoroughly shaking. Intravenously (slowly) 1.2 g every 8 hours, after dissolving 10-20 ml of water for injection
Cephalosporins			
1.	Cefazolin (Kefzol)Cefazolinum	Flak. 0.5, 1.0 g	Intramuscular (deep) 0.5-1.0g every 8-12 hours, after dissolving the contents of the vial in 5 ml of water for injection
2.	Cephalexin (cephalex) Cefalexinum	Tab. 0.25, 0.5 g Caps. 0.25 g	Inside 0.25-0.5 g 4-2 times a day
3.	Cefuroxime Cefuroxime	Tab. 0.5 g Flak. 0.75, 1.5 g	Inside 0.5 g 2 times a day Intramuscular 0.75-1.5 g every 8 hours, after dissolving the contents of the vial in 3 ml of water for injection
4.	Ceftriaxone Ceftriaxonum	Flak. 0.5, 1.0 g	Intramuscular (deep) 0.5-1.0g 2-1 times a day, after dissolving the contents of the vial in 2-3.5 ml of water for injection
5.	Ceftazidime Ceftazidime	Flak. 1.0 g	Intramuscular (deep) 2.0 g 1-2 times a day, after dissolving the contents of the vial in 3 ml of water for injection

6.	Cefpir Cefpirom	Flak. 2.0 g	Intramuscular 2g 2 times a day, after dissolving the contents of the bottle in water for injection
7.	Ceftobiprol Ceftobiprole	Flak. 0.5 g	In a vein 0.5 g 2 times a day, after dissolving the contents of the bottle in physical. rr
CARBAPENEMS			
1.	Meropenem Meropenem	Flak. 0.5, 1.0 g	In a vein, 0.5-1.0 g every 8 hours after pre-dissolving the contents of the bottle in 10-20 ml of water for injection
MONOBACTS			
1.	Aztreonam	Flak. 0.5, 1.0 g	In a vein, 0.5-1.0 g every 8 hours after pre-dissolving the contents of the bottle in 10-20 ml of water for injection

4.2. Theoretical questions for the lesson:

1. The concept of antibiosis, antibiotics, the spectrum of action of antibiotics
2. The history of the discovery and introduction of antibiotics in medical practice (research by L. Pasteur, I.I. Mechnikov, O. Fleming, G. Flory, E. Cheyn, Z. Ermolievoi, S. Vaksman).
3. The principles of antibiotic therapy (limits of use, rational choice of the drug, dosage, duration of therapy, interaction with other drugs, combined treatment). The concept of primary and backup antibiotics.
4. Classification of antibiotics by chemical structure, spectrum and mechanism of action.
5. A group of penicillins. Classification. The mechanism, spectrum and duration of action. Routes of administration.
6. Pharmacological characterization of drugs of the penicillin (benzylpenicillin sodium and potassium salts, bitsillin - 1 (benzathine benzylpenicillin) bitsillin - 3 bitsillin - 5 (benzathine benzylpenicillin, procaine benzylpenicillin +) oxacillin sodium, ampicillin, amoxycillin, carbenicillin, fenoksimetilpenitsipin). Comparative characteristics of drugs, indications for use, side and toxic effects. Anaphylactic shock on penicillins and relief measures.
7. Principles and goals of the combination of penicillin preparations with β-lactamase inhibitors: clavulanic acid (amoxiclav), sulbactam (unazine), tazobactam.
8. The group of cephalosporins. Classification of drugs by route of administration and by generations (generations). The mechanism and spectrum of action. Indications for use.
9. Comparative characteristics of preparations of the cephalosporin group (cefazolin, cephalexin, cefuroxime, cefotaxime, ceftriaxone, ceftazidime, cefpirome, ceftobiprol). Side effect of cephalosporins.
10. Pharmacological characteristics of carbapenems (imipenem, meropenem) and monobactams (aztreonam). Mechanism and spectrum of action, indications for use, side effects. General characteristics, mechanism and spectrum of action, indications for use, adverse reactions.

4.3. Practical tasks performed in preparation for the lesson:

4.3.1. Write down the prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1.Benzylpenicillin sodium salt in vials
2. Bicillin-5 in bottles
3. Oxacillin sodium salt in vials
4. Amoxicillin tablets and vials
5. Amoxiclav in capsules
6. Cefazolin in bottles
7. Cephalexin capsules
8. Cefuroxime tablets
9. Ceftriaxone in vials
10. Ceftazidime in vials
11. Meropenem in bottles

12. Aztreonam in bottles

4.3.2. Fill in the table:

Preparations	Mechanism of action	Indications for use.	Adverse reactions
1. Benzylpenicillin sodium salt			
2.Bicillin-5			
3. Oxacillin sodium salt			
4. Amoxicillin tablets and			
5. Amoxiclav in capsules			
6. Cefazolin in bottles			
7. Cephalexin capsules			
8. Cefuroxime tablets			
9. Ceftriaxone in vials			
10. Ceftazidime in vials			
11. Meropenem in bottles			
12. Aztreonam in bottles			

4.3.3. Solve test items*:*

1. Indicate antibiotics from the penicillin group for internal use:
A. Bicillin-1 B. Benzylpenicillin sodium salt
C. Ampicillin sodium salt
D. * Ampicillin trihydrate
E. Benzylpenicillin potassium salt

2. In what doses is benzylpenicillin sodium salt produced?
*A. 600000 B. 1250000 C. 300000 D. * 500000*
*E. * 1,000,000*

3. What drugs from the penicillin group are resistant to penicillinase?
A. Amoxicillin B. Ampicillin C. Bicillin -5 D. * Oxacillin
E. Bicillin-3

4. Identify antibiotics from the 3rd generation cephalosporin group
A. Cefazolin B. Cephalexin C. Kefzol D. Cefpir
E. * Ceftriaxone

5. Determine in what doses is ceftriaxone produced?
A. 0.1 B. 0.15 C. 0.2 D. * 0.5 E. * 1.0

6. The group of semi-synthetic penicillins owns all means, except:
A. Ampicillin B. Amoxicillin C. * Bicillin-5 D. Oxacillin
E. Ampioks

7. The cephalosporin group includes all means, with the exception of:
A. Cefpirome B. * Bicillin-1 C. Cephalexin D. Cefazolin
E. Ceftriaxone

8. The mechanism of action of penicillins is associated with:
A. Violation of protein synthesis B. Blockade of succinate dehydrogenase
C. Blockade of RNA polymerase D. Formation of resistant pores in the membrane
E. * Transpeptidase blockade

9. Find errors in the spectrum of action of benzylpenicillin sodium salt:
A. Diphtheria bacillus B. Staphylococcus C. Siberian wand D. Pale spirochete
E. * Salmonella

10. Specify an antibiotic from the monobactam group:
A. Tienam B. Imipenem S. * Aztreonam D. Azithromycin
E. Amikacin

5. Practical tasks that are performed in class:

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. To justify the choice of the drug, its therapeutic form, dosage, concentration and route of administration:

1. The drug for the treatment of pneumonia in the presence of an allergy to penicillins.
2. The drug from the group of cephalosporins for internal use.
3. The drug from the group of cephalosporins for parenteral use.
4. The antibiotic of choice for the treatment of streptococcal infections.
5. Long-acting benzylpenicillin drug.
6. The main antibiotic for the treatment of syphilis.
7. The drug of the penicillin group for infections that are caused by penicillin-forming staphylococci.
8. The drug of choice for meningitis in children.
9. Semisynthetic preparation of the penicillin group.
10. Antibiotic from the group of cephalosporins 1st generation.
11. Antibiotic from the group of cephalosporins of the third generation.
12. The combined antibiotic from the penicillin group.
13. Antibiotic for the prevention of recurrence of rheumatism.
14. An antibiotic from the carbapenem group.

6. Materials for self-control.

6.1. The task for self-control.

Using textbooks and teaching aids, fill out the following tables:

Table number 1. Fill in the table “Antimicrobial spectrum and indications for the use of beta-lactam antibiotics”

	Carbenicyl	Ceftobi prol	Ceftazidime	Cefazolin	Ceftriaxone
Antimicrobial spectrum					
Indication for use					

Table number 2. Fill in the table “Pharmacological characteristics of beta-lactam antibiotics”.

Pharmacological characteristics	Benzylpenicillin sodium salt	Ampicillin	Amoxiclav	Ceftriaxone	Meropenem	Aztreonam
Spectrum antimicrobial action a) on gram-positive microflora; b) on gram-negative microflora; c) a wide spectrum of action.						
Acid resistance						
Penicilinostasis						
Penetrate through the BBB						
Osteostropy						
Hepatotoxicity						
Nephrotoxicity						
Hematotoxicity						

6.2. Tasks for self-control.

TASK 1. A drug that is a combination of a drug from the group of penicillins and clavulanic acid. Effective in various bacterial infections, in particular diseases of the respiratory, urinary tract, skin and soft tissues, odontogenic and gynecological infections.

A) Identify the drug.

B) Dosage regimen.

TASK 2. Cephalosporin of the 3rd generation. It is used for infections of the urinary tract and abdominal cavity, bacterial meningitis and other diseases. It is prescribed for adults and children over the age of 12 years to 2 g per day.

A) Identify the drug.

B) The mechanism of action.

TASK 3. After parenteral administration of the antibiotic, the patient developed headache, joint pain, urticaria, fever, and eosinophilia in the blood.

A) Identify the drug.

B) What other effects are characteristic of this condition.

C) Prevention and care measures.

6.3. Tests for self-control.

1. A 33-year-old patient was injected with a preparation from the group of biosynthetic penicillins once every four weeks with the goal of seasonal prevention of rheumatism exacerbation. Identify this drug.

A. Bicillin-5 B. Oxacillin S. Ampicillin

D. Benzylpenicillin sodium salt

E. Benzylpenicillin potassium salt

2. Patient 60 years old, hospitalized in the surgical department, in connection with infection caused by Pseudomonas aeruginosa, sensitive to the antibiotic of the penicillin series. Determine which of the listed penicillins has a pronounced activity against Psedomonas aeruginosa (Pseudomonas aeruginosa)?

A. Benzylpencicillin B. Carbenicillin C. Amoxicillin D. Oxacillin

E. Ampicillin

3. *A 42-year-old patient has been prescribed ampicillin for the treatment of bacterial pneumonia. Determine what mechanism of the bactericidal action of the drug?*

A. Violation of the permeability of the cytoplasmic membrane

B. Suppression of intracellular protein synthesis

C. Suppression of cell wall synthesis of microorganisms

D. Suppression of SH-groups of enzymes of microorganisms

E. Antagonism with PABA

4. A 38-year-old patient has been prescribed benzylpenicillin sodium salt for the treatment of acute rheumatism. What is the duration of the drug?

A. 14 days B. 7 days C. 3 days D. 12 hours

E. 4 hours

5. In a patient with acute pneumonia, penicillin is a non-producing strain of staphylococcus. For treatment, a drug from the penicillin group was prescribed. Identify this drug.

A. Benizlpenicillin sodium salt B. Oxacillin

S. Ampicillin

D. Benizlpenicillin potassium salt E. Aztreonam

6. *The doctor prescribed β-lactam antibiotics to a patient with acute pneumonia, explaining his choice with their many advantages. What is not typical for cephalosporins?*

A. Cephalosporins, unlike penicillins, have a bacteriostatic effect

B. Cephalosporins resistant to beta-lactamase

C. Penicillins and Cephalosporins Cross-Hypersensitive

D. Cephalosporins are usually administered orally

E. Unlike penicillins, they increase the permeability of the bacterial cell wall

7. Beta-lactam antibiotics have high antimicrobial activity, but microorganisms quickly become resistant to them, since they produce beta-lactamase enzymes. Specific beta-lactamase inhibitors increase the stability and activity of antibiotics. Which of the following substances belongs to the group of beta-lactamase inhibitors?
A. Carboxylic acid
B. Mefenamic acid
C. Boric acid
D. Clavulanic acid
E. Benzoic acid

8. Patient primary syphilis receives complex therapy, which includes benzylpenicillin sodium salt. What is the mechanism of action of this drug?

A. Blockade of RNA synthesis B. Blockade of protein synthesis

C. Blockade of DNA synthesis D. Blockade of the synthesis of peptidoglycans of the microbial membrane

E. Blockade of thiol groups of enzymes

9. A third-generation cephalosporin was prescribed to a patient with pneumonia.
A. Cefazolin B. Cephalexin C. Kefzol D. Cefpirome E. Ceftriaxone
10. The patient for a long time used broad-spectrum antibiotics, which caused a decrease in appetite, nausea, diarrhea with a putrid odor. What is the side effect?
A. Dysbacteriosis B. Direct irritant effect C. Toxicosis
D. Allergic reaction E. Hepatotoxic reaction
11. The ratio of benzylpenicillin novocaine salt and bicillin-1 in the preparation of bicillin-5:
A. 1: 4 B. 1: 1 C. 5: 1 D. 1: 3 E. 3: 2
12. The bacteriostatic effect is:
A. Inhibition of the development and reproduction of microbes
B. The process of dehydration in a microbial cell
C. The process of mummification in a microbial cell
D. Denaturation of protoplasmic proteins and blockade of microorganism enzymes
E. Impaired bacterial wall formation
13. When sowing a smear from the phlegmon of the lower jaw of a patient seeded St.aureus, which is not sensitive to ampicillin. What drug should I choose for treatment?
A. Oxacillin B. Gentamicin C. Tetracycline D. Benzylpenicillin
E. Ampicillin
14. Beta-lactam antibiotics include everything except:
A. Penicillins B. cepholosporins C. Macrolides D. Carbapenems
E. Monabactams
15. The woman is 30 years old, is 32 weeks pregnant, the doctor prescribed an antibiotic in the treatment of acute bronchitis. Indicate which of the following drugs may be recommended in these circumstances?
A. Tetracycline B. Cephalexin C. Benzylpenicillin D. Doxycycline
E. Gentamicin
16. To increase the resistance of carbapenems to the action of dihydropeptidase-1 enzymes, impenem is combined with:
A. Cilastatin B. Sulbactam C. Tazobactam D. Trimethoprim E. Clavunat

Content module № 7	**Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs.**
To the topic № 14	**Pharmacology of antibiotics (continued).**

1. Relevance of the topic: The prevalence of infectious diseases, the narrow spectrum of penicillin, the emergence of resistant strains of microbes necessitated the production and use of new groups of antibiotics. The knowledge of the pharmacology of these drugs allows the doctor to choose highly effective drugs or their combinations in the treatment of infectious diseases.

2. The educational goals:

1. To generalize and analyze the main characteristics of antibiotics.
2. To interpret modern classifications of drugs used to treat diseases caused by pathogenic pathogens.
3. Summarize and analyze the pharmacological characteristics of the main antibiotics, explain the mechanism of action. Create a rational combination of antibiotics for various diseases and be able to theoretically substantiate it.
4. To assess the ratio of benefits and risks when using antibiotics. Predict and prevent side effects.
5. Write out recipes and conduct pharmacotherapy analysis of drugs from the group of antibiotics of a different structure.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Latin	Own prescription skills.
2. Microbiology	Apply knowledge on the classification of bacteria and their biological properties.
3. Biological chemistry	Describe the biochemistry of the mechanisms of antibacterial action.

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
1. Antibiosis	"Life versus life" - L. Pasteur suggested. Substances that realize antibiosis are called antibiotics.
2. Antibiotics	Life products (or their synthetic analogues and homologs) of living cells, selectively inhibiting the functioning of other cells - microorganisms, tumor cells, etc.
3. Antibacterial spectrum	List of microorganisms that are sensitive to the action of this antibiotic.
4. Chemotherapeutic spectrum	The list of diseases in which this antibiotic can be used.

PREPARATIONS

№	Name of the drug	Release form	Mode of application
MACROLIDES AND AZALIDES			
1.	Erythromycin Erythromycinum	Tab. 0.1, 0.25 g Caps. 0.1 g Ointment 1%	Inside 0.25-0.5 g 4 times a day 1 hour before meals Lubricate affected skin
2.	Spiramycin (Rovamycin)Rovamycin	Tab. 1,500,000,3000000ME Flak. 3000000ME	Inside 3000000ME 2-3 times a day Intravenously 1500000M0 every 8 hours
3.	Clarithromycin Klacid	Tab. 0.25, 0.5 g Flak. 0.5 g	Inside 0.25-0.5 g 2 times a day 0.5 g intravenously every 12 hours
4.	Azithromycin Azithromycinum	Tab. 0.25, 0.5 g Caps. 0.25, 0.5 g	Inside 0.5 g per day on an empty stomach for 3 days

		Flak. 0.5 g	Intravenously 0.5 g once a day, dissolved in an isotonic sodium chloride solution
TETRACYCLINES			
1.	TetracyclineTetracyclinum	Tab. 0.1, 0.25g Eye ointment 1%	Inside 0.25 g 4 times after meals Pledge for the lower eyelid 3-5 times
2.	Doxycycline hydrochloride Doxycyclini hydrochloridum	Caps. 0.1 g	Inside 0.1-0.2 g 1-2 times a day
AMINOGLYCOSIDES			
1.	Streptomycin sulfate Streptomycinи sulfas	Flac. 0.5, 1.0 g	In muscles 0.5-1.0 g 1-2 times a day in 2-4 ml of water for injection
2.	Gentamicin Sulfate Gentamycinи sulfas	Amp. 4% 2 ml Ointment 0.1%	In muscle 0.08 g 2 times a day Lubricate affected skin
3.	Amikacin sulfate Amikacinи sulfas	Flak. 0.25, 0.5g	In the muscles 0.25-0.5 g 2 times a day, previously dissolved in 2-3 ml of water for injection
4.	Tobramycin Tobramycinum	Amp. 4% 1 ml The eye. drops 0.3% 5ml	In muscle 1 mg / kg masa 3 r / day For 2 krap. every 4 hours in the eyes
NITROBENZENES (AMPHENICOLS)			
1.	Chloramphenicol Laevomycetinum (Chloramphenicol)	Tab. 0.25, 0.5 g Eye drops 0.25% 10 ml	Inside 0.25-0.5 g 4 times a day 1 cap. 3 times a day in each eye
LINKOSAMIDES			
1.	Lincomycin hydrochloride Lincomycini hydrochloridum	Amp. 30% 1 ml Caps. 0.25, 0.5 g	Into muscle 0.6 g every 8 hours Inside 0.5 g 3 times a day
2.	Clindamycin Clindamycin	Caps. 0.15 g	Inside 0.15-0.3 g 4 times a day
STEROID			
1.	Fusidine sodium Fusidinum-natrium	Tab. 0.25 g	Inside 0.5 g 3 times a day
CYCLIC POLYPEPTIDES			
1.	Polymyxin M Sulfate Polymyxini M sulfas	Tab. 500,000 units	inside 500000ED 4-6 times a day
Rifamycins			
1.	Rifampicin Rifampicinum	Caps. 0.15, 0.3 g	Inside 0.15-0.3 g 3 times a day 1 hour before meals
Glycopeptides			
1.	Vancomycin	Flak. 1,0g	Intravenously 1-2 g 4-2 times a day, dissolving with isotonic sodium chloride solution

4.2. Theoretical questions for the lesson:

1. Classification of antibiotics that disrupt protein synthesis and membrane structure according to the spectrum of their antimicrobial activity.
2. Classification of antibiotics that disrupt protein synthesis and membrane structure, according to the chemical structure and mechanism of action.
3. Antibiotics of the macrolide and azalide group (erythromycin, spiramycin, josamycin, roxithromycin, clarithromycin, azithromycin). General characteristics, mechanism and spectrum of action, indications for use, side effects.
4. Antibiotics of the tetracycline group (tetracycline, doxycycline hydrochloride). Pharmacokinetics, mechanism and spectrum of action, indications and contraindications for use, side effects and their prevention.

5. Antibiotics of the nitrobenzene group (chloramphenicol (chloramphenicol)). Mechanism of action and spectrum of action, indications for use, side effects.
6. Pharmacology of aminoglycoside preparations, classification (streptomycin sulfate, gentamicin sulfate, amikacin sulfate, tobramycin). Comparative characteristics, mechanism of action, indications and contraindications for use, side effects.
7. Antibiotics of the group of cyclic polypeptides-polymyxins (polymyxin M sulfate, sodium colistimethate). Mechanism and spectrum of action, indications for use, route of administration, side effects.
8. Pharmacological characteristics of rifampicin.
8. Pharmacology of lincosamides (lincomycin hydrochloride, clindamycin), glycopeptides (vancomycin, teicoplanin), fusidine sodium, antibiotics of various chemical groups (mupirocin).

4.3. Practical tasks performed in preparation for the lesson:

4.3.1. Write down prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1.Azithromycin tablets and vials
2. Clarithromycin tablets
3.Tetracycline tablets and ointments
4. Doxycycline hydrochloride tablets
5. Amikacin sulfate in vials
6. Gentamicin sulfate in ampoules
7. Levomycetin tablets and eye drops
8. Lincomycin hydrochloride in ampoules and capsules
9. Clindamycin capsules
10. Polymyxin M sulfate tablets
11. Rifampicin capsules
12. Vancomycin in bottles

4.3.2. Fill in the table:

Preparations	Mechanism of action	Indications for use.	Adverse reactions
1.Asithromycin			
2. Clarithromycin			
3.Tetracycline			
4. Doxycycline hydrochloride			
5. Amikacin sulfate			
6. Gentamicin sulfate			
7. Chloramphenicol			
8. Lincomycin hydrochloride			
9. Clindamycin			
10. Polymyxin M sulfate			
11. Rifampicin			
12. Vancomycin			

4.3.3. Solve test items:

1. Indicate antibiotics of choice for the treatment of typhoid fever:
A. Gentamicin B. * Chloramphenicol C. Erythromycin D. Lincomycin E. Polymyxin
2. Indicate antibiotics from the group of semi-synthetic tetracyclines:
A. Amikacin B. Chloramphenicol C. * Metacycline D. * Doxycycline E. Oxytetracycline
3. Indicate antibiotics that disrupt the synthesis of nucleic acids or messenger RNA:
A. Doxycycline B. * Rifampicin C. Nystatin D. Streptomycin E. Lincomycin
4. Indicate osteotropic antibiotics:
A. Ceftriaxone B. Ampicillin C. * Metacycline D. * Lincomycin E. * Doxycycline

5. Indicate antibiotics that violate the permeability of the membrane of the microbial cell:
A. * Nystatin B. * Polymyxin C. Metacycline D. * Amphotericin B E. Azithromycin
6. Indicate antibiotics belonging to the macrolide group:
A. Cefazolin B. Doxycycline C. * Azithromycin D. * Erythromycin E. Amikacin
7. Indicate antibiotics from the aminoglycoside group:
A. Erythromycin B. * Amikacin C. * Gentamicin D. * Streptomycin E. Doxycycline
8. Indicate antibiotics that inhibit protein synthesis in microorganisms:
A. * Tetracycline B. * Azithromycin C. polymyxin D. Ceftriaxone E. Amoxicillin
9. Indicate antibiotics that primarily affect gram-negative microflora:
A. Nystatin B. * Polymyxin C. Metacycline D. * Amphotericin B E. Azithromycin
10. Is bone marrow aplasia characteristic of any antibiotic?
A. Erythromycin B. Amikacin C. * Chloramphenicol D. Azithromycin E. Doxycycline

5. Practical tasks that are performed in class

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration:

1. The drug for the treatment of pneumonia in the presence of allergies to beta-lactam antibiotics.
2. A drug for the treatment of meningitis.
3. The drug of typhoid fever.
4. Otto and nephrotoxic antibiotic.
5. The drug causes myelotoxicity.
6. Antibiotic - a cyclic polypeptide.
7. Antibiotic from the macrolide group.
8. An antibiotic that forms complex compounds with metal cations.
9. The drug has a wide spectrum of activity, inhibits protein synthesis in the 30S ribosomal subunit.
10. Antibiotic for bowel sterilization before surgery.
11. Antibiotic with pronounced osteotropic effect.
12. Antibiotic for the prevention of candidiasis.
13. An antibiotic from the group of glycopeptides.
14. Antibiotic from the group of azalides.

6. Materials for self-control.

6.1. Tasks for self-control.

Using textbooks and teaching aids, fill out the following tables:

Table No. 1. Fill in the table "Antimicrobial spectrum and indications for the use of antibiotics"

	Erythromycin	Streptomycin	Mupirocin	Fusidine Sodium
Antimicrobial spectrum				
Indications for use				

Table No. 2. Fill in the table "Pharmacological characteristics of antibiotics".

Pharmacological characteristics	Doxycycline hydrochloride	Azithromycin	Amikacin sulfate	Polymyxin M sulfate	Fusidine sodium	Lincomycin hydrochloride	Chloramphenicol
Spectrum antimicrobial action a) on gram-positive microflora: b) on gram-negative microflora: c) a wide spectrum of action:							
Acid resistance							

Penetrate through the BBB							
Osteotropism							
Hepatotoxicity							
Nephrotoxicity							
Hematotoxicity							

6.2. Tasks for self-control.

TASK 1. The drug is similar in antibacterial action to antibiotics of the macrolide group. Inhibits protein synthesis in microorganisms. Effective against pathogens of gas gangrene and tetanus. Used in the treatment of acute and chronic infections of the respiratory system, genitourinary system, skin.

A) Identify the drug. B) Dosage regimen.

TASK 2. An antibiotic that can be used to treat tuberculosis, brucellosis and other dangerous infections. It is very poorly absorbed in the intestine, therefore it is used only by injection. The most serious complications are vestibular disorders and hearing impairment (ototoxicity).

A) Identify the drug. B) The mechanism of action.

TASK 3. A broad-spectrum antibiotic. It belongs to the group of semi-synthetic tetracyclines. It is indicated for acute and chronic bronchitis, pneumonia, pleurisy, gonorrhea. It is applied 1-2 times a day in a dose of 0.1-0.2 g.

A) Identify the drug. B) Side effects.

TASK 4. During treatment of salmonellosis with a broad-spectrum antibiotic, leukopenia, anemia, dyspepsia, and dysbiosis occurred.

A) Identify the drug. B) Determine antibiotic reserve.

6.3. Tests for self-control.

1. The patient was given bacterial pneumonia treated with erythromycin. It is known that its antibacterial properties are due to the ability to bind to the free 50S subunit of the ribosome. What bacterial activity does this antibiotic block?

A. Protein synthesis B. Fat synthesis C. Polysaccharide synthesis D. DNA synthesis

E. Synthesis of RNA

2. A 30-year-old patient with a diagnosis of acute osteomyelitis was prescribed an antibiotic, penetrates well into bone tissue. Within three weeks of using this tool, the patient's condition improved. What drug was used?

A. Lincomycin B. Bicillin-5 C. Benzylpenicillin D. Polymyxin-M E. Ampicillin

3. A 40-year-old patient suffering from chronic otitis media and suffered hepatitis six months ago should have a course of antibiotic therapy. Which of the following drugs can be prescribed to the patient?

A. Tetracycline B. Amikacin C. Gentamicin D. Ampioks E. Doxycycline

4. The patient has an infection of the meninges. Which of these substances will create the highest concentration in the cerebrospinal fluid with intramuscular (or oral) administration?

A. Fusidin-sodium B. Chloramphenicol C. Gentamicin D. Cefazolin E. Oxacillin

5. The patient has a urinary tract infection. Which of these substances will provide the highest concentrations of the drug in active form in their lumen?

A. Azithromycin B. Lincomycin C. Chloramphenicol D. Rifampicin C. Gentamicin

6. The patient read the instructions for the prescribed antibiotic, where in the side effects section the possibility of muscle relaxant, ototoxic, teratogenic, mutagenic effects is indicated. What drug was prescribed?

A. Streptomycin B. Amoxicillin C. Tetracycline D. Chloramphenicol E. Azithromycin

7. A woman at the 12th week of pregnancy in connection with acute cholecystitis must undergo a course of antibiotic therapy. Why are some antibiotics, in particular tetracycline, not recommended for pregnant women?

A. Due to the ability of the drug to increase uterine tone

B. Due to inhibitory effects on fetal respiration

C. Due to the teratogenic effect of the drug D. Due to the ototoxicity of the drug

E. Due to the ability to cause anemia in a pregnant woman

8. The drug has a wide spectrum of antimicrobial activity. There is an antibiotic of choice for treating typhoid fever and other salmonellosis. Side effects: inhibition of blood formation (myelotoxicity), dyspeptic disorders, dysbiosis. Name the drug.
A. Tetracycline B. Polymyxin C. Benzylpenicillin D. Amikacin E. Chloramphenicol
9. The following are inherent in aminoglycoside antibiotics, with the exception of:
A Antiviral and immunostimulating action B. A wide spectrum of antimicrobial action C. Use for the treatment of tuberculosis
D. Bactericidal action E. Ability to affect the auditory and vestibular apparatus
10. The patient after tooth extraction is intended for doxycycline hydrochloride. What recommendations should a dentist give a patient by writing a prescription for this drug?
A. Avoid prolonged sun exposure
B. Drink plenty of fluids, preferably milk
C. Take before meals D. The course of treatment should not exceed 5 days
E. Do not take with NSAIDs
11. A 32-year-old patient was taken to the department of maxillofacial surgery with multiple fractures of the lower jaw and wounds to the face. What antibiotic is undesirable to use to prevent the development of wound infection in the pre-postoperative period if tubocurarine chloride was used during the operation?
A. Amikacin sulfate B. Benzylpenicillin-sodium C. Amoxicillin
D. Ceftriaxone E. doxycycline hydrochloride
12. The patient has an intracellular (rickettsiosis) infection. Which of the following will be most effective?
A. Doxycycline B. Bicillin-1 C. Amikacin D. Streptomycin E. Cephalexin
13. What antibiotic, which negatively affects the development of bones and teeth, is contraindicated in children under 12 years of age?
A. Doxycycline hydrochloride B. Amoxicillin C. Azithromycin
D. Benzylpenicillin sodium salt E. Amikacin
14. The mother of a 2-year-old child came to the dentist. During pregnancy she took an antibiotic several times due to exacerbation of chronic bronchitis. On examination, the child has a destruction of the incisors, yellow tooth enamel, a brown streak in the neck of the teeth. Which of the following drugs upsets the development of teeth?
A. Tetracycline B. Amikacin C. Rifampicin D. Fusidin E. Metronidazole
15. The patient had a burning sensation in his mouth, a white fluffy coating on the tongue. Which of the proposed tools will solve the problem of thrush?
A. Nystatin B. Neomycin C. Amphotericin D. Amikacin E. Acyclovir
16. A patient who went to the hospital complaining of diarrhea was diagnosed with amoebic dysentery. Tetracycline was prescribed for complex treatment. What is the action of the prescribed drug?
A. Etiotropic action B. Irreversible action C. Direct action D. Main action E. Symptomatic action
17. Treatment of phlegmon with antibiotic inhibitors of murein synthesis is ineffective. Based on the antibiotic profile, a broad-spectrum bactericidal antibiotic is prescribed. After 6 hours, the patient suddenly had a fever of up to 40 ° C with chills, pain in the calf muscles, hypotension, oliguria. What is the leading cause of this condition?
A. Endotoxic shock B. Septic condition C. Internal bleeding
D. Toxic effect of the drug E. bacteremia
18. The patient for a long time uncontrollably took an antibiotic. After the examination, inhibition of leukopoiesis and nosebleeds were revealed. What drug caused the complications?
A. Levomycetin B. Erythromycin C. Amikacin D. Linkomycin E. Doxycycline
19. The patient has gonorrhea urethritis. According to the results of microbiological studies, he was prescribed azithromycin. What type of antimicrobial action does this drug have?
A. Bactericidal B. Bacteriostatic C. fungicidal D. Fungistatic
E. Virulostatic

Content module 7	**Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs.**
To the topic № 15	**Antituberculous, antiviral, antispirochetic drugs.**

1. Relevance of the topic: It is known that tuberculosis spreads every year in all countries. This is due, on the one hand, to the characteristics of the vital functions of mycobacteria, and on the other hand, to the insufficient amount of anti-TB drugs. Given the need for long-term prescription of anti-TB drugs, first of all, you need to know the features of the classification and the principles of combination therapy of tuberculosis. When using anti-TB drugs, special attention should be paid to the side effects of drugs and to determine measures for their prevention. The frequency and prevalence of viral infections necessitates knowledge of the pharmacology of antiviral agents. Spirochetotic agents are necessary for the treatment of sexually transmitted syphilis.

2. The educational goals:

1. To summarize the basic principles for the appointment of anti-tuberculosis, antiviral and anti-syphilitic drugs.
2. Explain the mechanisms of action of anti-TB, anti-viral and anti-syphilitic drugs.
3. To analyze the principles of classification of anti-tuberculosis, antiviral and anti-syphilitic drugs.
4. Interpret indications for use and the need for combined use of anti-tuberculosis, antiviral and anti-syphilitic drugs.
5. Assess the side effects and the need for rational replacement of drugs in the treatment of tuberculosis, viral infections and syphilis.
6. Explain the origin of side effects of anti-tuberculosis, antiviral and anti-syphilitic drugs and know the ways to prevent them.
7. Write out the prescriptions and make a pharmacotherapeutic analysis of the prescribed anti-tuberculosis, antiviral and anti-syphilitic drugs.
8. Make a table “Side effects of anti-tuberculosis, antiviral and anti-syphilitic drugs”.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Microbiology.	Describe the vital signs of mycobacteria, viruses and pale spirochete.
2. Latin.	Own prescription skills.

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
1. Tuberculosis drugs.	Drugs that affect all subpopulations of mycobacteria.
2. Antiviral drugs.	Drugs that inhibit the reproduction and vital activity of viruses, including influenza, herpes, and HIV viruses.
3. Antisyphilitic drugs.	Drugs for the treatment of syphilis.

PREPARATIONS

№	**Name of the drug**	**Release form**	**Mode of application**
ANTI-TUBERCULOSIS DRUGS			
1	Isoniazid Isoniazidum	Tab. 0.1 and 0.3 g	Inside 0.1-0.3 g 3-2 times a day (WFD = 0.6 g, IRR = 0.9 g)
2	Rifampicin Rifampicinum	Caps. 0.15 g	Inside 0.15-0.3g 3-2 times a day on an empty stomach
3	Pyrazinamide Pirazinamidum	Tab. 0.25 and 0.5 g	Inside 0.5g 1-2 times a day
4	Amikacin sulfateAmikacini sulfas	Flak. 0.25, 0.5g	In the muscles 0.25-0.5 g 2 r / day, dissolving in 3 ml of water d / injection
5	Streptomycin sulfate	Flak. 1.0 g	Intramuscularly 1 g 1 time per day

	Streptamicini sulfas		
6	Kanamycin Kanamycinum	Tab. 0.25 g Flak. 0.5 and 1.0 g	Inside 0.75 g Muscle 0.5 g
7	Cycloserine Cycloserinum	Tab. (caps.) 0.25 g	Inside 0.25 g 3 times a day
8	Protionamide Ethionamide CycloserineEthionamidum	Tab. 0.25 g coated	Inside 0.25 g 3 times a day
9	Protionamide Protionamidum	Tab. (dragee) 0.25 g	Inside 0.25 g 3 times a day
10	Ethambutol Ethambutolum	Tab. 0.1 and 0.4 g	Inside 0.015 - 0.025 g per 1 kg 1 time per day
11	Ciprofloxacin Ciprofloxacinum	Tab. 0.25 and 0.5 g	Inside 0.5 g once a day
12	Ofloxacin Ofloxacinum	Tab. 0.2 g	Inside 0.2 g 2 times a day
13	Sodium para-aminosalicylateNatrii para-aminosalicylas	Tab. 0.5 g Flak. 3% 250 and 500ml	Inside 3-4 g 3 times a day
ANTIVIRAL AGENTS			
1	Remantadine Remantadinum	Tab. 0.05 g	Inside 0.05 g once a day
2	Interferon alfa-2b Laferon Laferonum	Flak. 100000 units; 1,000,000 units; 3000000 units	For intranasal administration Intramuscularly 1,000,000 units 1-2 r / day
3	Oxolin Oxolinum	Ointment 0.25% 10 g	Apply on the affected surface 3-4 times a day
4	Oxolin Aciclovir	Tab. 0.2 g Eye ointment 3% 5 g Cream 5% 5g Ointment 2.5% 5g	Inside 0.2 g 5 times a day To lay ointment for an eyelid Apply to the skin, mucous membranes 5 times a day
5	Zidovudine Azidothymidine Azidothymidine	Caps. 0.1 g Flak. 2% 20 ml	Inside 0.2 g 6 times a day. Intravenously 1-2 mg / kg 6 times a day
ANTIPYROCHETOSITES			
1	Benzylpenicillin sodium salt, bicillin-5, cefazolin	See “Pharmacology of beta-lactam antibiotics”	
2	Clarithromycin, azithromycin		
3	Doxycycline hydrochloride		
4	Bioquinol Biiochinolum	Flak. 100 ml	Intramuscularly 2-3 ml once every 3 days

4.2. Theoretical questions for the lesson:

1. Tuberculosis drugs. The basic principles of treatment and prevention of tuberculosis.
2. Classification of anti-TB drugs.
3. Pharmacodynamics and pharmacokinetics of isoniazid. Side effects that occur with prolonged use of isoniazid and ways to prevent them.
4. Pharmacological characteristics of rifampicin. Features of long-term use. Side effects.
5. Drugs of other groups of antibiotics in the treatment of tuberculosis (streptomycin sulfate, kanamycin, amikacin sulfate, cycloserine, capreomycin).
6. Pharmacological characteristics of drugs of different chemical groups (ethionamide, pyrazinamide, ethambutol, sodium paraaminosalicylate, ciprofloxacin, ofloxacin, lomefloxacin, moxifloxacin). Side effects.

7. Antiviral drugs. Classification of antiviral drugs according to the mechanism of action and indication for use
8. Pharmacological characteristics of drugs prescribed for influenza (remantadine, interferons), ribavirin, osetalmivir). Features of the application.
9. Medicines used for herpetic infections (acyclovir, ganciclovir, valaciclovir, proteflazide, ribavirin, idoxuridine).
10. Pharmacology of interferons (interferon alfa-2b (laferon). Inducers to interferon (cycloferon, amizon, kagocel, proteflazid).
11. The possibilities of using antiviral agents in the complex treatment of AIDS patients (zidovudine (azidothymidine), abacavir, sanvinavir, indinavir).
12. Antisyphilitic drugs. General characteristics of drugs. Principles for treating syphilis.
13. Classification of antisyphilitic drugs. Features of the use of antibiotics (penicillins, macrolides, cephalosporins), bismuth preparations (bioquinol) in the treatment of syphilis

4.3. Practical tasks that are performed in the lesson:

4.3.1. Write down the prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indication for use, possible complications):

1. Isoniazid tablets.
2. Rifampicin in capsules.
3. Pyrazinamide tablets.
4. Amikacin sulfate in vials.
5. Acyclovir tablets and ointments.
6. Interferon alfa-2b (Laferon) in ampoules.
7. Zidovudine (Azidothymidine) in tablets.
8. Benzylpenicillin sodium salt in vials.
9. Ciprofloxacin in tablets.
10. Bioquinol in vials.

4.3.2. Заполнить таблицу:

Preparations	Mechanism of action	Indications for use.	Adverse reactions
Isoniazid			
Rifampicin			
Pyrazinamide			
Amikacin sulfate			
Acyclovir			
Interferon alfa-2b (Laferon)			
Zidovudine (Azidothymidine)			
Benzylpenicillin sodium salt			
Ciprofloxacin.			
Bioquinol			

4.3.3. Solve test items:

1. After prescribing the drug for the prevention of influenza, the patient experienced insomnia, agitation, and hallucinations. What drug was prescribed?

A. Acyclovir B. Azidothymidine C. Oxolin D. Polymyxin E. * Remantadine

2. The patient complained of herpetic eruptions on her upper lip. What antiviral drug should be prescribed?

A. * Acyclovir B. Azidothymidine C. Miconazole D. Dexamethasone E. Interferon

3. A patient with prolonged pneumonia was prescribed a drug that has a non-specific antiviral effect. Name the drug:

A. Midantan B. Oxolin C. Azidothymidine D. * Interferon E. Acyclovir

4. Before the operation, the patient was prescribed an antibiotic, which can enhance the effect of muscle relaxants. What is this drug?
A. Azithromycin B. Penicillin C. * Streptomycin D. Chloramphenicol E. Acyclovir
5. The patient has a herpetic rash on the red border of the lips. Which drug will help?
A. Oxolin V. Florenal S. * Acyclovir D. Linkomycin E. Remantadin
6. A patient with tuberculosis should be prescribed the most effective treatment for this disease. What is this drug?
A. Kanamycin B. * Isoniazid C. Rifampicin D. PASK E. Indomethacin
7. Patients with facial nerve neuritis, which is treated with anti-TB drugs, must be prescribed an agent with a pronounced etiopathogenetic effect. What is this drug?
A. Thiamine chloride B. Ascorbic acid C. * Pyridoxine hydrochloride
D. Retinol acetate E. Nicotinic acid
8. Treatment of tuberculosis occurs with the help of combination chemotherapy, which combines substances of different mechanisms of action. Which anti-tuberculosis drug inhibits transcription of DNA into RNA?
A. Isoniazid B. Streptomycin C. * Rifampicin D. Ethionamide E. PASK
9. In the neonatal ward, the incidence of children in acute respiratory infections caused by different viruses has sharply increased. In order to prevent infection, the appointment of human leukocyte interferon is recommended. Indicate the route of administration of this drug.
A. Subcutaneous B. Oral C. * Intranasal D. Inhalation E. In muscle
10. The patient has primary syphilis. Indicate the most effective antibiotic for treatment.
A. Amphotericin B. Kanamycin C. * Benzylpenicillin D. Clindamycin E. Bioquinol

5. Practical exercises that are performed in class:

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration and prescribe:

1. A synthetic agent that is most effective in treating tuberculosis.
2. The antibiotic of the rifampicin group, which is most effective.
3. The drug is of medium effectiveness, which is used for caseous lymphadenitis.
4. Antibiotic of the aminoglycoside group.
5. An anti-tuberculosis drug, the basis of the mechanism of action of which is competition with PABA.
6. Antiviral agent for herpetic lesions.
7. Antiviral agent for influenza lesions.
8. Antiviral agent for treating HIV-infected people.
9. Antibiotic for the treatment of acute syphilis.
10. The drug from the group of salts of heavy metals for the treatment of syphilis.

6. Materials for self-control.

6.1. Tasks for self-control.

Using textbooks and teaching aids, fill out the following tables:
Table No. 1. Fill in the table “Features of the pharmacodynamics of drugs”

A drug	Mechanism of action	Indications for use
Osetalmivir		
Remantadine		
Proteflazid		
Ribavirin		
Ganciclovir		
Cycloferon		
Ethambutol		
Sodium paraaminosalicylate		

6.2. Tasks for self-control:

TASK 1. A patient who took anti-TB drugs developed polyneuritis. What drug caused this side effect?

A) Identify the drug.

B) How can neurological disorders be prevented?

C) Describe the features of the pharmacokinetics of the drug.

TASK 2. A tuberculosis patient was taking rifampicin as part of combination therapy. After some time, the hepatotoxic effect of the drug turned out to be.

A) What is the mechanism of action of the drug?

B) What other side effects can rifampicin cause?

C) Why should rifampicin be prescribed as part of combination therapy?

OBJECTIVE 3. When treating an AIDS patient, an antiviral agent has been used that has a genomotropic effect.

A) Identify the drug.

B) What is the mechanism of action of the drug?

6.3. Tests for self-control

1. How many International units can one bottle of Laferon contain?

A. 100,000 IU B. 100 IU C. 10 IU D. 1 IU E. 1,000,000 IU

2. The patient went to the doctor with complaints of stomatitis, which he treated with antiseptic agents. However, the doctor determined that the disease is viral in nature. What drug should be prescribed to the patient?

A. Acyclovir B. Remantadin S. Oxolin D. Amphotericin B E. Azidothymidine

3. The doctor prescribed the antiviral drug zidovudine (azidothymidine). What is the antiviral mechanism of this drug?

A. Inhibits viral protease B. Inhibits reverse transcriptase of the virus

C. It impairs the ability of the virus to penetrate the cell D. Stimulates the synthesis of interferon E. Activates B-lymphocytes

4. For a man of 50 years, with the goal of preventing influenza, the doctor recommended a drug that is an adamant derivative. What drug was prescribed?

A. Zidovudine (Azidothymidine) B. Acyclovir (Zovirax) C. Florenal

D. Polymyxin E. Remantadine

5. The patient was prescribed acyclovir. What is the mechanism of action of this drug?

A. Inhibition of cell wall protein synthesis

B. Violation of the permeability of the cell membrane

C. Impaired protein synthesis in the cell D. Inhibition of enzyme SH-groups

E. Impaired nucleic acid synthesis

6. A woman of 28 years old with complaints of fever up to 39 C, headache, runny nose, general weakness, the doctor prescribed remantadine. What is the mechanism of action of this drug?

A. Inhibits the release of virus RNA from a protein capsule

B. Competitive antagonism from PABA C. Inhibits murein synthesis

D. Blocks reverse transcriptase E. Suppresses virus reproduction

7. The city has an epidemic of influenza. Which drug should be prescribed for a child to be instilled into the nasal passages to prevent the disease?

A. Zidovudine B. Zovirax C. Interferon D. Paracetamol E. Remantadine

8. In a patient with tuberculosis, after treatment, vision deteriorated sharply. What drug could cause this complication?

A. Kanamycin B. Isoniazid C. Interferon D. Ethionamide E. Rifampicin

9. A patient with tuberculosis was prescribed rifampicin as part of the complex therapy. What is the mechanism of action of this drug?

A. Inhibition of glycosidase B. Translocase blockade C. Inhibition of transpeptidase

D. Inhibition of SH-groups of enzymes E. Blockade of DNA-dependent RNA polymerase

10. A tuberculosis patient was prescribed streptomycin. What drug should be used to prevent the toxic effects of streptomycin?

A. Thiamine chloride B. Ascorbic acid C. Pyridoxine hydrochloride
D. Calcium pantothenate E. Nicotinic acid

11. A 35-year-old male patient with tuberculosis underwent a full course of complex therapy in a hospital. After leaving the hospital, he became ill, a cough appeared, in connection with which he was independently treated with gentamicin, after which his hearing worsened. What drug that was previously used to treat tuberculosis will increase the side effect of gentamicin?

A. Ethambutol B. Isoniazid C. Streptomycin D. Ethionamide
E. Rifampicin

12. Patient suffers from genetically determined enzyme deficiency
N-acetyltransferase. What drugs can quickly cause toxic effects?

A. Barbiturates B. Beta-blockers C. Nitrates
D. Antibiotics-tetracyclines E. Isonicotinic acid hydrazides

13. To a patient with tertiary syphilis to accelerate the resorption of gum, reduce pain, the drug was prescribed in a solution inside, 1 tablespoon 3 times a day. What drug was prescribed?

A. Potassium chloride B. Magnesium sulfate C. Sodium nitrate D. Potassium iodide
E. Calcium chloride

14. In a patient with syphilis, after testing, hypersensitivity to bicillin-1 was detected. What drug can it be replaced?

A. Streptomycin B. Tetracycline C. Chloramphenicol D. Ampicillin E. Biseptol

15. A 19-year-old patient with primary syphilis receives complex therapy, which includes the sodium salt of benzylpenicillin. What is the mechanism of action of this drug?

A. Inhibits the release of virus RNA from a protein capsule
B. Competitive antagonism from PABA C. Blockade of murein synthesis
D. Blockade of RNA synthesis E. Blockade of DNA synthesis

16. A patient has found herpes simplex (Herpes simplex). Indicate an effective antiviral drug for the treatment of this disease.

A. Midantan B. Acyclovir C. Interferon D. Metisazon E. Remantadin

17. A patient with pulmonary tuberculosis, 39 years old, receives effective complex therapy, which includes streptomycin sulfate. What is the mechanism of action of this drug?

A. Protein synthesis blockade B. PABA imitation C. FAD imitation
D. Blockade of RNA synthesis E. Blockade of DNA synthesis

18. A patient with tuberculosis should undergo surgery. Which of the anti-TB drugs can not be used with curare-like drugs?

A. Ethambutol B. Isoniazid C. Streptomycin D. Ethionamide E. Rifampicin

19. The choice of the dose of the drug requires consideration of the individual characteristics of the body, on which the pharmacokinetics of the substances depends. For which of these means are there individual characteristics of the elimination rate of a genetic nature?

A. Ethambutol B. Ethionamide C. Streptomycin D. Isoniazid
E. Rifampicin

20. Acetylation of which agent is significantly inhibited during genetic enzymopathy?

A. Erythromycin B. Ethionamide C. Kanamycin D. Isoniazid
E. Ethambutol

21. A social worker after long-term communication with a person without a certain place of residence fell ill with tuberculosis. The composition of the complex treatment included a semi-synthetic broad-spectrum antibiotic. Specify the drug:

A. Ampicillin B. Rifampicin C. Cefotaxime D. Erythromycin
E. Lincomycin

22. What antibiotic can cause staining of urine, sputum, tears in red?

A. Rifampicin B. Amoxicillin C. Tetracycline D. Chloramphenicol E. Azithromycin

23. Bioquinol is characterized by everything except:

A. Blockade of thiol groups of enzymes B. Treponemostatic action
C. Ingestion D. Anti-inflammatory, absorbable properties

E. Intramuscularly

24. A 37-year-old patient was hospitalized in the venereology department with a diagnosis of syphilis. Which of the following drugs will be used to treat the patient?

A. Benzylpenicillin B. Biseptol C. Nitroxoline D. Chloramphenicol
E. Tetracycline

25. The patient was diagnosed with pulmonary tuberculosis. What medicine is used to treat tuberculosis?

A. Isoniazid B. Penicillin C. Norsulfazole D. Tetracycline E. Furazolidone

26. In a patient's dispensary, a patient with an infiltrative form of pulmonary tuberculosis treated with isoniazid showed symptoms of B6-hypovitaminosis. Why isoniazid leads to this phenomenon?

A. Isoniazid is an antagonist of vitamin B6
B. Vitamin absorption is slowed down
C. Accelerated elimination
D. A strong bond is formed with plasma proteins
E. Accelerated Biotransformation

27. Indicate the drug for antiretroviral therapy for an AIDS patient:

A. Valacyclovir B. Acyclovir C. Zidovudine D. Bonaphton E. Remantadine

28. To determine the agent for the etiotropic treatment of influenza - an influenza A and B neuraminidase inhibitor:

A. Midantan B. Oseltamivir C. Interferons D. Metisazon E. Remantadine

29. Specify a drug for treatment of a patient with AIDS - an HIV protease inhibitor:

A. Valacyclovir B. Acyclovir C. Idoxuridine D. Saquinavir
E. Remantadine

30. A 36-year-old woman was diagnosed with tuberculous infiltrate. Which antibiotic should be prescribed?

A. Rifampicin B. Oxacillin C. Tetracycline D. Lincomycin
E. Azithromycin

23. A tuberculosis patient was prescribed a first-line synthetic agent for the treatment of this disease. As a result of therapy, neuritis of the facial nerve and imbalance arose. What drug caused these side effects?

A. Capreomycin B. Isoniazid C. Rifampicin D. PASK E. Ethionamide

24. A patient with a neuritis of the facial nerve, which is treated with an anti-TB drug derived from GINC, must be prescribed an agent with a pronounced etiopathogenetic effect. What is this drug?

A. Thiamine chloride B. Ascorbic acid C. Pyridoxine hydrochloride
D. Retinol acetate E. Nicotinic acid

Content module № 7	**Antimicrobial, antiviral, antifungal, antiparasitic, antiprotozoal drugs.**
To the topic № 16	**Antiparasitic and antiprotozoal drugs.**

1. Relevance of the topic: According to the WHO, 500 million, or every 10th inhabitant of the Earth, suffers from tropical diseases, such as malaria, schistosomiasis, filariasis, trypanosomiasis, etc. In Ukraine, the number of infested can reach 5 million. We can assume that every inhabitant of our country Throughout life, he is repeatedly ill with parasitic diseases. Because the section "Antiparasitic drugs" are one of the relevant sections of pharmacology.

2. The educational goals:

1. To summarize and analyze modern classifications of therapeutic agents that are used to treat diseases that are caused by pathogenic pathogens.
2. Summarize and analyze the main antiprotozoal and anthelmintic drugs, explain their mechanisms of action.
3. Offer a rational combination of antiprotozoal and anthelmintic drugs.
4. Create an algorithm for helping patients with acute poisoning with antiparasitic drugs.
5. Assess the benefit / risk ratio when using antiprotozoal and anthelmintic drugs. Predict and prevent side effects.
6. Write down prescriptions and make a pharmacotherapeutic analysis of the prescribed antiparasitic drugs.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Latin	Own prescription skills.
2. Medical biology	Section "Parasitology". Apply knowledge of the life cycles of parasites, various forms of the relationship between them and the human body, the origin and evolution of parasitism, pathways of infection, diagnostic methods, and prevention of parasitosis.
3. Medical microbiology and virology	Section “Protozoal infections”. Apply knowledge of taxonomy, morphology, biochemical properties, pathogenicity factors, pathways of human infection with parasites.

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
1. 1. Antimalarial drugs	Drugs that are detrimental to the causative agent of malaria are plasmodium.
2. Schizontropic effect: - - histoshizontotropic action -hematoshizontropic action	Effect on asexual forms of plasmodia, schizonts. Effect on tissue schizonts (pre-erythrocyte and paraerythrocyte forms). Effect on red blood cell schizonts.
3. Hamontotropic action	The effect on the sexual forms of plasmodia, gamont, and on the forms of metagamous reproduction that occur in the body of a mosquito after copulation of male and female gamont
4. Anti-trichomoniasis	Preparations for the treatment of patients with trichomoniasis
5. Anti-chlamydia drugs	Preparations for the treatment of chlamydia patients
6. Anti-amoebic drugs	Drugs for the treatment of patients with amoebiasis
7. Antiangiotic agents	Preparations for the treatment of patients with giardiasis
8. Antitoxoplasmosis agents	Preparations for the treatment of patients with toxoplasmosis

9. Anthelmintic (anthelmintic) agents	Preparations for the treatment of diseases caused by parasitic chervils and their larvae

PREPARATIONS

№	Name of the drug	Release form	Mode of application
ANTIPROSPOSITIVE PRODUCTS			
1.	Chloroquine (Hingamine) Chlorochinum (Chingaminum)	Tab. 0.5, 0.25 g Amp. 5% 5 ml	Inside, 0.5 g 2 times a day; In muscle 10 ml 2 times a day
2.	Pyrimethamine (Chloridine)Pyrimethaminum (Chloridinum)	Tab. 0.025, 0.01 g	Inside 0.03 g per day for 2-3 doses for 3 days; 0.025 g once a week for prevention
3.	Quinine hydrochloride Chinini hydrochloridum	Powder Tab. 0.25, 0.5 g Amp. 50% 1ml	nside, 1.0-1.2 g per day for 2-3 doses after a meal; Subcutaneously 2 ml twice after 6-8 hours., 1 ml in a vein in 20 ml of 40% glucose solution
4.	Primakvin (Primakhin) Primaquinum (Primachinum)	Tab. 0.003, 0.009 g	Inside 0.027 g per day
5.	Metronidazole Metronidazolum (Trichopolum, Klion, Flagil, Vahimid)	Tab. 0.25 g Flak. 0.5% 100 ml Suppository vag. 0.1 g	Inside 0.25 g 3 times a day Intravenously 100 ml slowly for 20-30 minutes every 8 years Into the vagina 0.1 g at night
6.	Emethine hydrochlorideEmetini hydrochloridum	Amp. 1% 1ml	Intramuscularly, subcutaneously 1.5 ml
7.	Furazolidone Furazolidonum	Tab. 0.05 g	Inside 0.1-0.15 g after meals 4 times a day
8.	Aminoquinol Aminochinolum	Tab. 0.25, 0.05 g	Inside 0.15 g after meals 3 times a day in cycles of 5 days
9.	Solusyurmin Solusurminum	Amp. 20% 10ml	In a vein, muscles, subcutaneously at the rate of 0.04 g / kg to 0.1 g / kg
ANTIHELMINTIC PRODUCTS			
1.	Piperazine adipate Piperazini adipinas	Flak. 5% 50 ml Tab. 0.2, 0.5 g	Inside, 1.5-2 g per hour or after 30-60 minutes. after meal
2.	Naphthamone Naphtamonum	Tab. 0.5 g	Inside 5 g an hour after breakfast
3.	Fenasal Phenasalum	Tab. 0.25 g	Inside 2 g an hour after breakfast
4.	Mebendazole Mebendazolum	Tab. 0.1 g Suspension 20 mg / ml Syrup 0.1 g / ml	Inside 1 tab. 2 per day for 3 days
5.	Levamisole Levamisolum	Tab. 0.05, 0.15 g	Inside 0.15 g one-time bedtime
6.	Pirantela PamoatPiranteli pamoas	Tab. 0.25 g Suspension 5% 15 ml	Inside 0.75 g or 15 ml of the suspension 1 time per day (after breakfast)
7.	Pumpkin seeds Semina Cucurbitae	Pack of 100 g	Inside 400-450 ml of decoction (150g of seeds - 450 ml of water in a water bath for one hour)
8.	Thick Male Fern Extract Extr. Filicis maris spissi	Caps. 0.5 g	Inside 6-8 g, drink with a solution of sodium hydrogen carbonate
9.	Praziquantel	Tab. 0.6 g	Inside, 20-40-75 mg / kg per day (in 2-3

	Praziguantel		doses)
10.	Albendazole Albendazole	Tab. 0.4 g	Inside 0.4 g once, once a day for 3 days
11.	Chloxyl Chloxylum	Powder 50 g	1 hour after breakfast, 2 g every 10 minutes. (2 days 10-20 g)
12.	Diethylcarbamazine Diethylcarbamazine Dithrazine	Tab. 0.1 g	Inside 2 mg / kg 3 times a day

4.2. Theoretical questions for the lesson:

1. Classification of antiprotozoal drugs
2. Antimalarial drugs. Basic principles for the prevention and treatment of malaria. Classification of antimalarial drugs (chloroquine, primaquine, quinine, pyrimethamine, mefloquine, artemisin, fanzidar). Mechanism of action. Medication for malaria coma.
3. Medicines that are used to treat trichomoniasis. Pharmacokinetics, pharmacodynamics of metronidazole. Indication for use and side effects.
4. Pharmacology of tinidazole, secnidazole, ornidazole and furazolidone in the treatment of trichomoniasis.
5. Medicines for the treatment of patients with chlamydia (macrolides, doxycycline). Pharmacological characteristics of macrolides, doxycycline.
6. Classification of anti-amoebic drugs. Pharmacological characteristics of the drugs (metronidazole, emethine hydrochloride, chingamine, hiniofon, tetracyclines, intetrix).
7. Medicines for the treatment of patients with giardiasis. Pharmacological characteristics of metronidazole, tinidazole, furazolidone, aminoquinol.
8. Medicines that are used to treat patients with toxoplasmosis (chloridine, chingamine, aminoquinol, sulfonamides). Pharmacological characteristics of chloridine, chingamine, sulfonamide drugs.
9. Medicines for the treatment of patients with leishmaniasis. Antimony preparations.
10. Medicines for the treatment of patients with balantidiasis. The use of antibiotics (aminoglycosides and tetracyclines) in the treatment of balantidiasis.
11. Anthelmintic (anthelmintic) drugs. Classification of anthelmintic drugs (for nematodoses: levamisole (decaris), pyrantel (combantrine), piperazine adipinate (adiposil), naphthamone (alkopar), pyrvinium pamoate, ditrazine; for tremotadoses: praziquantel (biltristaside), prismatic tantalosum (biltestodicin), priratsitalzid (prichantaside) male fern, pumpkin seed).
12. Anthelmintic drugs with a wide spectrum of action of mebendazole (Vermox), albendazole (Vormil).

4.3.Practical tasks that are performed in preparation for the lesson:

4.3.1. Write down the prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Hingamine tablets and ampoules.
2. Chloridine tablets.
3. Metronidazole tablets and vaginal suppositories.
4. Primachin in tablets.
5. Furazolidone tablets.
6. Solyusurmin in ampoules.
7. Mebendazole tablets.
8. Albendazole tablets.
9. Levamisole tablets.
10. Pyrantel in tablets.
11. Praziquantel tablets.
12. (Niclosamide) Phenasal tablets.

4.3.2. Fill in the table:

Preparations	Mechanism of action	Indications for use.	Adverse reactions
Hingamine tablets and ampoules.			
Chloridine tablets.			
Metronidazole.			
Primaquine in tablets.			
Furazolidone tablets.			
Solusyurmin in ampoules.			
Mebendazole tablets.			
Albendazole tablets.			
Levamisole tablets.			
Pyrantel in tablets.			
Praziquantel tablets.			
(Niclosamide) Phenasal tablets.			

5. Practical tasks that are performed in class:

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration:

1. Drugs for the treatment of malaria.
2. Preparations for the treatment of trichomonodosis.
3. Drugs for the treatment of chlamydia.
4. Drugs for the treatment of amoebiasis.
5. Drugs for the treatment of giardiasis.
6. Drugs for the treatment of toxaplasmosis.
7. Preparations of a wide spectrum of anthelmintic action.
8. Drugs for the treatment of nematodosis.
9. Drugs for the treatment of cestodosis.
10. Drugs for the treatment of extraintestinal helminthiasis.

6. Materials for self-control.

6.1. Tasks for self-control.

Using textbooks and teaching aids, fill out the following tables:

Table No. 1. “Pharmacological characteristics of antimalarial drugs”

Fill in the table (mark “+” drugs that affect the various stages of plasmodia)

Preparations	Drugs that affect schizogony (schizontropic)		Drugs Affecting Sporogony (Hamontotropic)
	Histoshizontotropic	Hematoschizontropic	
1. Quinine		+	
2. Chloridine	+	+	+
3. Hingamine		+	
4. Primakvin	+		+

Table No. 2 Fill in the table (names of medicines)

Means used for intestinal nematodoses and broad-spectrum agents *	Means used for intestinal cestodoses	Means used for extraintestinal helminthiases
Piperazine adipate	Aminoacrychine	Ditrazine citrate
Mebendazole *	Pumpkin seeds	Praziquantel

Pyrantel		Chloxyl
Levamisole		
Tansy flowers		
Praziquantel *		

6.2. Tasks for self-control.

OBJECTIVE 1. An antimalarial drug was prescribed for a patient with malaria, which is produced in 0.1 g tablets and is yellow. The patient took this drug 1 tablet 3 times a day for 4 days, but the attacks of malaria did not stop, although the drug was replaced another anti-malarial drug, also yellow in the form of tablets of 0.009 g each. However, the patient felt worse: nausea, headache, cyanosis of the lips and nails, fever, urine acquired a reddish tint.

A) What is the cause of the complications?

B) What correction in treatment is necessary?

Q) Did the doctor do the right thing by replacing the drug?

TASK 2. Before traveling abroad to a country with a high incidence of malaria, specialists who are serving, it was proposed to use anti-malaria drugs to prevent it.

A) What drugs should be used for personal prophylaxis of malaria?

B) Give the rationale for their preventive action.

TASK 3. At the reception in the antenatal clinic, a 27-year-old woman came to the obstetrician with a 4-week pregnancy and complained that her first pregnancy ended in the birth of a dead baby, the second - a miscarriage.

A) How can a protozoal infection lead to the indicated consequences of pregnancy?

B) What is the drug prophylaxis of this disease?

Q) Does it start immediately from the moment a woman turns to a consultation?

TASK 4. A woman with a 3-year-old child came to the pediatrician with a question about how to prevent helminthic infestations in the family, given that a dog lives in the apartment with them.

A) What is the prevention of this disease?

B) What anthelmintic drugs can be used for the whole family?

TASK 5. In a 3-year-old child, weakened due to a childhood infection, enterobiosis was diagnosed.

A) What anthelmintic should be the drug of choice for treating a child?

B) According to what scheme should I use it?

TASK 6. In a patient with helminthiasis, laboratory analysis revealed multiple invasion (roundworms, pinworms, whipworms).

A) What drugs are effective in this pathology?

B) Which one is most commonly used

6.3. Tests for self-control.

Antiprotozoal drugs

1. In a patient with chronic hepatosis, the presence of amoeba in the liver was biopsy determined. What treatment should be prescribed?

A. Metronidazole B. Metisazon C. Ornidazole D. Akrikhin E. Metacyclin

2. The patient consulted a gynecologist about severe itching and vaginal discharge. When diagnosing trichomoniasis, the doctor prescribed an oral drug 3 times a day. After taking the drug, there were sensations of a metallic taste in the mouth, a loss of appetite and a laxative effect. What drug was prescribed?

A. Metronidazole B. Furazolidone C. Solusurmin D. Sulfadimesin E. Metacycline

3. A 52-year-old man was diagnosed with systemic amoebiasis with damage to the intestines, liver, and lungs. What drug should be prescribed?

A. Metronidazole B. Ciniophon C. Tetracycline D. Chingamine E. Enteroseptol

4. The patient has a severe form of ulcerative skin lesions, intoxication, high fever. During the study, Leishmania was discovered. Which remedy will help?

A. Metronidazole B. Solusurmin C. Emetin D. Streptomycin E. Metacycline

5. As part of the Ukrainian contingent of the UN peacekeeping force in Sierra Leone, which is dangerous for the epidemiology of malaria, a soldier was adopted. What drug should be taken by a soldier to prevent malaria before leaving for this zone?

A. Ciprofloxacin (Cifran) B. Hiniofon (Yatren) C. Chloroquine (Hingamin)

D. Phenoxymethylpenicillin (Ospen) E. Chloramphenicol (Levomycetin)

6. A 32-year-old patient was prescribed an immunosuppressive drug known as antiarrhythmic and anti-malarial for the treatment of scleroderma. What remedy was prescribed?

A. Delagil B. Dexamethasone C. Azathioprine D. Cycloserine E. Prednisolone

7. A 30-year-old patient went to the doctor with complaints of diarrhea and abdominal pain for 5 days, an increase in body temperature to 37.5 ° C with fever. The day before, the patient was in the forest, where he drank water from an open source. A bacteriologically confirmed diagnosis was established: amoebic dysentery. Specify a nitroimidazole group drug for the treatment of this disease?

A. Metronidazole B. Furazolidone C. Levomycetin D. Phthalazole E. Emetina hydrochloride

8. A patient who suffers from scleroderma (systemic collagenosis) was prescribed an immunosuppressant, which belongs to the group of antimalarial drugs, quinoline derivatives. The patient took the drug for a long time. During this time, his weight decreased, his hair turned gray, his visual acuity decreased, and his eyes blinked. He was referred to an ophthalmologist who immediately canceled the drug. Determine which drug was used to treat the patient?

A. Hingamine B. Cyclophosphamide C. Chinocide D. Chrysanol E. Methotrexate

9. A healthy person is in a malaria-hazardous area. Which of the following drugs should be prescribed for the individual chemoprophylaxis of malaria?

A. Chloridin V. Sulfalen C. Tetracycline D. Metronidazole E. Enteroseptol

10. The patient consulted a doctor with complaints of intestinal dysfunction. The doctor noted the symptoms of duodenitis, enteritis. In a laboratory study, the diagnosis was made: giardiasis. What drug is indicated for use?

A. Metronidazole B. Erythromycin C. Monomycin D. Khingamin E. Tetracycline

11. The drug negatively affects the erythrocytic forms of malarial plasmodia, dysenteric amoeba. Used for the treatment and prevention of malaria, treatment of amebiasis and collagenoses. Identify this drug?

A. Hingamin B. Emetina hydrochloride C. Tetracycline D. Erythromycin E. Quinine

12. The patient has been treated with an antiprotozoal drug for a week. After visiting a dentist who did anesthesia with a vasoconstrictor, the patient developed an arrhythmia and hypertension. What anti-decongestant is not compatible with vasoconstrictors?

A. Metronidazole B. Erythromycin C. Monomycin D. Furazolidone E. Enteroseptol

13. To the scheme of labor stimulation, it is necessary to add an agent that relates to antiprotozoal drugs. What is this drug?

A. Hingamin B. Emetina hydrochloride C. Metronidazole D. Enteroseptol

E. Quinine hydrochloride

14. In the treatment of protozoal infection, a means of gradual schizontocidal action was used, which has competitive antagonism with PABA. Identify this remedy.

A. Chloridin V. Khinin S. Khinotsid D. Primakvin E. Chlorokvin

15. Toxoplasmosis was detected in a pregnant woman. What remedy can not be prescribed for the treatment of protozoal infection in the first half of pregnancy due to teratogenic effects? A. Chloridin B. Chloramphenicol C. Chinocide D. Metronidazole E. Enteroseptol

16. For the treatment of protozoal infection, an agent has been prescribed that blocks the sulfhydryl groups of thiol enzymes. Identify this drug.

A. Solusurmin B. Chloramphenicol S. Sulfalen D. Metronidazole E. Hingamine

17. The patient was prescribed tissue amoebicide, which caused vomiting. Identify this drug. A. Tetracycline B. Emetin S. Etofamide D. Metronidazole E. Hiniofon

18. The patient has gingivitis caused by anaerobic infection. What group of antimicrobials should be prescribed for treatment?

A. Nitrofurans B. Polymyxins C. Aminoglycosides D. Sulfanilamides

E. Nitroimidazoles

19. A patient with malaria, who was treated with quinine, had a fever, acute erythrocyte hemolysis, hemoglobinuria. Which enzyme deficiency contributes to these complications?
A. Glucose phosphate dehydrogenase B Acetyltransferase C. Catalase
D. Butyrylcholinesterase E. Uridinediphosphoglucuron transferase
20. To the patient who takes metronidazole, the doctor recommended not to drink alcoholic beverages. What is the possible effect of the drug?
A. Teturam-like B. Papaver-like C. Caffeine-like
D. Morphine-like E. Clonidine-like
21. It is known that in patients with genetically determined deficiency of red blood cell glucose-6-phosphate dehydrogenase, red blood cell hemolysis may develop in response to the administration of certain anti-malarial drugs. What is the name of this manifestation of atypical reactions to drugs?
A. Idiosyncrasy B. Allergy C. Sensitization D. Tachyphylaxis E. Tolerance
22. A patient who suffers from peptic ulcer of the 12th colon is prescribed such drugs: omeprazole, amoxicillin, metronidazole. Therapy proved to be appropriate. What is the main reason for the high effectiveness of this complex of drugs?
A. Inhibition of Helycobacter pylori B. Reducing the effects of pathogenic intestinal flora
C. Strengthening the resistance of the mucous membrane of the 12-colon intestine
D. Enhanced prostaglandin synthesis E. Improved microcirculation
23. A healthy person is in an area endemic for malaria. What drug should be prescribed for the personal chemoprophylaxis of malaria?
A. Metronidazole B. Sulfalen C. Chloridin D. Streptomycin E. Metacycline
24. The patient underwent appendectomy. For the chemoprophylaxis of anaerobic complications in the postoperative period, it is advisable to prescribe:
A. Metronidazole B. Cefatoxime C. Tetracycline D. Ampiox E. Biseptol

Anthelmintic

1. What is the underlying mechanism of the proto-leaf effect of levamisole?
A. Inhibition of succinate dehydrogenase, ATPase B. Inhibition of monoamine oxidase
C. Impaired DNA synthesis D. Cholinesterase activation E. Inhibition of N-acetyltransferase
2. The patient complains of nausea, abdominal pain. After a laboratory study, the diagnosis of ascariasis was established. For treatment, a one-time agent was prescribed, which also affects the immune system. Point it out.
A. Levamisole B. Mebendazole C. Pyrantel D. Phenasal E. Furazolidone
3. A 5 year old boy is concerned about anal itching. Helminths of the class of nematodes (pinworms) were found. Choose a remedy for deworming the child.
A. Aminoacrychine B. Niclozamide C. Pumpkin seeds D. Praziquantel E. Piperazine adipate
4. If it is necessary to prevent helminthiases in a children's team, what means of a wide spectrum of action for nematodes should be chosen?
A. Levamisole B. Mebendazole C. Pyrantel D. Chloxyl E. Naftamon
5. Patients with lesions with tape helminths. What anthelmintic agent is not absorbed from the digestive tract and has a tenicidal effect?
A. Levamisole B. Mebendazole C. Pyrantel D. Phenasal E. Furazolidone
6. A patient with tape worms should be dewormed in a hospital. What anthelmintic should be used?
A. Piperazine adipate B. Mebendazole C. Pyrvine pamoate
D. Male Fern Extract E. Antimonyl Sodium Tartrate
7. Prevention of pinworm in children caused drowsiness and dizziness. What remedy was used?
A. Levamisole B. Mebendazole C. Pyrantel D. Phenasal E. Naftamon
8. What is the purpose of using the anthelmintic levamisole in dentistry?
A. Treatment of acute pulpitis B. Stimulation of regeneration
C. Root canal filling D. Stimulation of immunity
E. Treatment of aphthous stomatitis
9. A nematodosis was diagnosed in a patient with epilepsy. What anthelmintic can not be prescribed to the patient, because it will cause an exacerbation of the underlying disease?

A. Piperazine adipate B. Mebendazole C. Pyrvine pamoate
D. Male Fern Extract E. Antimonil Sodium Tartrate

10. The patient according to laboratory data found ascariasis and decreased immunity. What drug should be prescribed?

A. Levamisole B. Mebendazole C. Pyrantel D. Phenasal E. Furazolidone

11. The patient found feces of ascaris in the study of feces. What remedy should be prescribed?

A. Adiposil B. Nystatin C. Chloramphenicol D. Phenasal E. Furazolidone

12. The patient according to laboratory data established ascariasis. What remedy should be prescribed?

A. Chloxyl B. Mebendazole C. Pyrantel D. Phenasal E. Naftamon

13. In a 5-year-old child, a mixed invasion by roundworms and pinworms was discovered. What anthelmintic drug should be prescribed once?

A. Mebendazole B. Piperazine adipate C. Pumpkin seeds D. Phenasal E. Furadonin

14. The patient was found to have hookworm worms. Which drug is most effective in treating this type of nematodosis?

A. Levamisole B. Mebendazole C. Pyrantel D. Phenasal E. Naftamon

15. The patient has a mixed version of helminthiasis. What is the treatment for isoquinoline pyrazine derivatives?

A. Mebendazole B. Adiposil C. Albendazole D. Levamisole E. Praziquantel

16. The patient revealed schistosomiasis. What remedy, which refers to salts of heavy metals, was prescribed to the patient intravenously?

A. Piperazine adipate B. Mebendazole C. Pyrvine pamoate
D. Male Fern Extract E. Antimonyl Sodium Tartrate

17. An anthelmintic drug has been prescribed, which causes the destruction of nucleoproteins in the cells of intestinal worm epithelium. Determine this remedy if you need to take it with a low fat diet?

A. Chloxyl B. Mebendazole C. Pyrantel D. Phenasal E. Naftamon

18. For the treatment of helminthic infestations, the drug is taken once on an empty stomach or in the evening 3-4 hours after a light dinner with 2 g of sodium bicarbonate. Determine which drug is taken in this way?

A. Ditrazine B. Mebendazole C. Diphezil D. Phenasal E. Naftamon

19. For mass treatment of patients for trematodosis and cestodosis, a highly effective agent was used once. Identify this drug.

A. Mebendazole B. Piperazine adipate C. Pyrantel D. Levamisole E. Praziquantel

20. An anthelmintic is used with a low fat diet and laxatives. When deworming, what drug can not be used castor oil?

A. Piperazine adipate B. Pumpkin seeds C. Pirvinia pamoate
D. Male Fern Extract E. Antimonyl Sodium Tartrate

21. In the kindergarten for the mass deworming used a pill, which must be chewed. What did the children offer?

A. Adiposil B. Vermox C. Combantrine D. Phenasal E. Alcopar

22. For the treatment of enterobiasis, an agent is prescribed, which is a cyanine dye that caused stool to turn red. What remedy has such qualities?

A. Piperazine adipate B. Phenasal C. Pyrvine pamoate
D. Male Fern Extract E. Antimonyl Sodium Tartrate

23. The imidazole derivative, which inhibits the absorption of glucose by helminths and inhibits the formation of ATP in them, binds to tubulin and disrupts the formation of microtubules, is taken once, more often with enterobiosis. Identify this drug.

A. Mebendazole B. Adiposil C. Alcopar D. Levamisole E. Praziquantel

24. What means, suitable for mass deworming, cannot be used in drivers, dispatchers, because it causes drowsiness.

A. Chloxyl B. Mebendazole C. Pyrantel D. Phenasal E. Naftamon

25. For the mass treatment of patients with trematodoses and cestodoses, a highly effective derivative of isoquinoline pyrazine was used once. Identify this drug.

A. Pyrantel B. Piperazine adipate C. Albendazole D. Levamisole E. Praziquantel

26. An anthelmintic is used with a low-fat diet and laxatives. When deworming, what drug can not be used castor oil?

A. Piperazine adipate B. Pumpkin seeds C. Pirvinia pamoat
D. Male Fern Extract E. Antimonil Sodium Tartrate

27. In kindergarten for the conduct of mass deworming used the drug in tablets, which must be chewed. What did the children offer?

A. Adiposil B. Vermox C. Combantrine D. Phenasal E. Alcopar

28. The imidazole derivative, which suppresses the absorption of glucose by helminths and inhibits the formation of ATP in them, is taken once, more often with enterobiosis. Identify this drug.

A. Mebendazole B. Adiposil C. Alcopar D. Levamisole E. Praziquantel

29. What means, suitable for mass deworming, cannot be used in drivers, dispatchers, because it causes drowsiness.

A. Chloxyl B. Mebendazole C. Pyrantel D. Phenasal E. Naftamon

Content module 8	**Preparations of macro- and microelements. Enzyme and antiferment preparations. Plasma substitutes and preparations for parenteral nutrition. Medicines used for the treatment and prevention of diseases of hard tissues, tooth pulp and periodontal disease. Drugs that affect the metabolism of bone and cartilage. Antidotes.**
To the topic № 17	**Macro and micronutrient preparations, enzyme and antiferment preparations, plasma substitutes and preparations for parenteral nutrition.**

1. Relevance of the topic: Preparations of sodium, potassium, magnesium, calcium and other metals, enzyme and antienzyme preparations are widely used in medical practice. Plasma substitutes and preparations for parenteral nutrition are used to eliminate volemic and circulatory disorders, increase osmotic pressure, restore acid-base balance, detoxification, nutrition.

2. The educational goals:

1. To summarize and analyze the pharmacological characteristics of macro- and microelement preparations, enzyme and antiferment preparations, plasma substitutes and preparations for parenteral nutrition.
2. Interpret indications for the use of drugs in accordance with pharmacodynamics.
3. Assess side effects of drugs.
4. To analyze the indications for the use of hypotonic and hypertonic salt solutions.
5. Write out recipes and make pharmacotherapeutic analysis of the prescribed preparations of macro- and micronutrients, enzyme and antienzyme preparations, plasma substitutes and preparations for parenteral nutrition.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Inorganic chemistry	Determine the properties of alkali and alkaline earth metal salts.
2. Biological chemistry	Depict the chemical formula of glucose, determine its properties.
3. Latin	Prescription writing skills.

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
Sodium preparations	Hypertonic sodium chloride solution having a weak local antimicrobial effect. Isotonic sodium chloride solution, normalizes water-salt metabolism, osmotic pressure and ionic composition.
Potassium preparations	Drugs used in the treatment of hypokalemia, with arrhythmias and coronary heart disease.
Calcium preparations	Drugs used in inflammatory and exudative processes of an allergic nature, hypoproduction of the parathyroid gland, osteoporosis.
Magnesium preparations	Drugs used as cholekinetics, laxatives and antihypertensives.
Glucose (Dextrose)	The drug has energy, antitoxic and osmotic effects.
Homeostasis	Biochemical constancy of the internal environment of the body.
Alkalosis	Increase in arterial blood pH above 7.45.
Acidosis	Decrease in arterial blood pH below 7.35.
Hypohydration, Exicosis	Dehydration occurs when water loss predominates when it enters the body.

Isoosmolar	Equivalent loss of water and electrolytes (blood loss, intestinal toxicosis, massive burns).
Hypoosmolar	Loss of electrolytes predominates over loss of water (profuse, prolonged sweating, Addison's disease, vomiting, diarrhea, correction of isoosmolar dehydration without electrolytes).
Hyperosmolar	Water loss predominates over electrolyte loss (deficiency of water intake, fever with excessive sweating, mechanical ventilation, diabetes insipidus, infusion of hypertonic solutions and parenteral nutrition).

PREPARATIONS

№	Name of the drug	Release form	Mode of application
1.	Sodium bicarbonateNatrii hydrocarbonas	Powder 50 g Flak. 4% 200 ml Amp. 4% 20 ml	For the preparation of a solution Intravenous drip Intravenously
2.	Sodium chloride Natrii chloridum	Amp. 0.9% 10 ml Flak. 0.9% 200 ml Amp. 10% 10 ml Flak. 10% 200 ml	Intravenously Intravenous drip Intravenously Rinse a purulent wound
3.	Potassium chloride Kalii chloridum	Amp. 4% 50 ml Tab. 0.5, 1 g	In a vein drip., Dissolving 10 times with 5% glucose solution Inside 1 g 4-5 times / day
4.	Potassium and Magnesium Asparaginate Potassium and magnesium aspartate (Asparkam) Asparcamum	Tab. Amp. 10 ml	Inside 2 tab. 3 times / day In a vein 10 ml
5.	Magnesium sulfate Magnesii sulfas	Amp. 25% 5 ml Powder 30 g	In the vein, muscle 5 ml Inside 10-30 g, dissolve in 100 ml of water
6.	Calcium chloride Calcii chloridum	Amp. 10% 10 ml	Slowly Intravenously 10ml
7.	Calcium gluconate Calcii gluconas	Tab. 0.5 g Amp. 10% 10 ml	Inside 1-3 g 3 times a day In the muscles, in the vein 0.5-1 g
8.	Calcium citrate Calcium citrate	Tab. 0.5	Inside 0.5 - 1 g 3 times a day
9.	Dextrose (Glucose) Glucosum	Flak. 5% 400 ml Amp. 40% 10 ml	Intravenous drip Intravenously 10 ml
10.	Hydroxyethyl starch Hydroxyethylstarch Refortan Refortan	Flak. 6%, 10% 200, 250, 400, 500 ml	Drip intravenously
11.	Chymotrypsin crystalline Chymotrypsin crystalline	Flak. Amp. 0.01 g	Dissolve the contents of the ampoule or vial in 1-2 ml Introduce 0.9% sodium chloride solution into the muscles, inhaled
12.	yaluronidase (Lidase)	Flak. Amp. 64 UO	Dissolve the contents of the ampoule or vial in 1 ml of 0.9% sodium chloride solution or in 1 ml of 0.5% novocaine solution under the skin

4.2. Theoretical questions for the lesson:

1. Preparations of macro- and microelements. Potassium preparations (potassium chloride, potassium / magnesium asparaginate (asparkam, panangin)). Pharmacodynamics, indications for use.
2. Magnesium preparations (magnesium sulfate). Pharmacokinetics, pharmacodynamics. The dependence of the effect on the route of administration. Indications for use.
3. Calcium preparations (calcium chloride, calcium gluconate, calcium citrate). Pharmacological effects, indications for use, route of administration.
4. Sodium preparations (sodium chloride). Pharmacological effects of isotonic, hypertonic and hypotonic sodium chloride solution. Indications for use.
5. Energy, antitoxic, osmotic effect of glucose (glucose), indications for the use of isotonic and hypertonic glucose solution. Medical use of oxygen. 6. Plasma replacing fluids. General characteristics of plasma substitutes. Pharmacological and indications for the use of saline solutions (isotonic sodium chloride solution, Ringer-Locke solution, trisol), alkaline solutions (sodium bicarbonate, trisamine), sugars (glucose), preparations containing human blood components (human albumin), synthetic preparations (reopoliglukin , neohaemodesis, hydroxyethyl starch (reformed)). Preparations for parenteral nutrition (lipofundin).
7. Classification of enzyme preparations. The mechanism of action and indications for use of peptidases (pepsin), proteases (crystalline trypsin, crystalline chymotrypsin), nucleases (ribonuclease, deoxyribonuclease), hyaluronidase preparations (lidase, ronidase). Fibrinolytic agents (streptoliasis, alteplase, urokinase, fibrinolysin). Indications for their use.
8. General characteristics of enzyme inhibitors (aprotinin, aminocaproic acid). Classification. Indications and contraindications for use.

4.3. Practical tasks that are performed in preparation for the lesson:

4.3.1. Write down prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Sodium bicarbonate in ampoules and vials
2. Sodium chloride in isotonic and hypertonic solution.
3. Potassium chloride in tablets and ampoules.
4. Potassium and magnesium asparaginate (Asparkam) in tablets and ampoules.
5. Magnesium sulfate in ampoules and underdosed powder.
6. Calcium chloride in ampoules.
7. Calcium citrate tablets
8. Dextrose (Glucose) in ampoules and vials
9. Hydroxyethyl starch (Reftan) in vials
10. Chymotrypsin crystalline
11. Hyaluronidase (Lidase)

4.3.2. Fill in the table:

Preparations	Mechanism of action	Indications for use.	Adverse reactions
Sodium bicarbonate			
Sodium chloride			
Potassium chloride			
Potassium and Magnesium Asparaginate			
Magnesium sulfate			
Calcium chloride			
Calcium citrate			
Glucose			
Hydroxyethyl starch			
Chymotrypsin crystalline			
Hyaluronidase (Lidase)			

4.3.3. Solve test items:

1. A worker who began to work in a hot shop, went to the doctor with complaints of a headache, sickening one. He said that he was very sweating and drank at work up to 5 liters of tap water. What remedy quickly and effectively relieves symptoms and normalizes the condition of the worker?

A. Decamevit B. Pentalgin C. Analgin D. Acetylsalicylic acid

E. * Salt

2. A patient with uncompensated diabetes mellitus has ketoacidosis and shortness of breath. What drug normalizes external respiration?

A. Bemegrid B. Ammonium chloride C. Naloxone D. Potassium chloride E. * Sodium bicarbonate

3. The patient, while taking digitoxin, developed bigeminia, muscle weakness, dyspepsia, and visual impairment. What drugs will reduce these phenomena?

A. Magnesium preparations B. * Potassium preparations C. Sodium preparations

D. Iron preparations E. Calcium preparations

4. A patient with signs of dehydration was delivered to the emergency department. The doctor immediately prescribed the administration of isotonic sodium chloride. Which of the following conditions does this need to be done?

A. Pregnancy toxicosis B. Osteoporosis C. Edema D. * Cholera E. Arthritis

5. In a patient with hypoparathyroidism, convulsions, laryngospasm occurred. An examination in the blood revealed a significant decrease in the level of ionized calcium and an increase in pH. Which of the drugs should first be administered to the patient for the correction of metabolic alkalosis?

A. Sodium bicarbonate B. Trisamine C. Magnesium oxide D. Aluminum hydroxide

E. * Ammonium chloride

6. It is necessary to choose a remedy that causes hypotension when injected into a vein, and a choleretic effect - if you drink:

A. * Magnesium sulfate B. Sodium chloride C. Calcium chloride

D. Magnesium oxide E. Potassium chloride

7. For hypertension apply only:

A. Magnesium sulfate (inside) B. Sodium chloride C. * Magnesium sulfate (w / w)

D. Magnesium oxide E. Potassium chloride

8. To mark which group sodium chloride belongs to:

A. Acids B. High molecular weight plasma substitutes

C. Alkaline earth metal salts D. * Alkali metal salts E. Alkalis

9. What drug is prescribed to reduce cardiac glycoside toxicity?

A. Magnesium sulfate B. Sodium chloride C. Calcium chloride

D. Magnesium oxide E. * Potassium chloride

10. The patient was accidentally injected into a vein a large dose of a solution of potassium chloride, which caused respiratory depression and severe bradycardia. What antagonistic agent should be introduced as an aid?

*A. Magnesium sulfate B. Sodium chloride C. * Calcium chloride*

D. Magnesium oxide E. Sodium bicarbonate

5. Practical tasks that are performed in class:

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration:

1. A drug for the correction of metabolic acidosis.
2. Salt preparation for washing purulent wounds.
3. The drug is used in combination with loop diuretics to eliminate hypokalemia.
4. The drug is used for acute hypoparathyroidism.
5. Salt preparation for stopping a hypertensive crisis.
6. A drug for dissolving drugs.
7. Saline laxative.

8. The combined preparation of potassium.
9. The drug for the prevention of caries.
10. Saline with anti-allergic, hemostatic effect.
11. Salt plasma substitute
12. Plasma substitute from the sugar group
13. Proteolytic enzyme preparation
14. Enzymatic agent for treating joint contracture.

6. Materials for self-control.

6.1. Tasks for self-control.

Using textbooks and teaching aids, fill out the following tables:
Fill in the table "Adverse reactions of salts of alkali and alkaline earth metals ".

№	Preparations	Adverse reactions
1.	Sodium	
2.	Potassium	
3.	Calcium	
4.	Magnesium	

6.2. Tasks for self-control:

OBJECTIVE 1. An acid that has keratoplastic, anti-inflammatory and antimicrobial effects. It is part of deodorants, antiseptic and antimicrobial agents (Lassar paste and others).
A) Identify the drug. B) What is the basis of the mechanism of action of the drug?
TASK 2. A patient with symptoms of acidosis was intravenously prescribed a salt preparation that has alkaline properties.
A) Identify the drug.
B) What drugs should be prescribed for the correction of acidosis?
TASK 3. For a patient suffering from peptic ulcer, the doctor prescribed an antacid, in connection with which there was nausea, abdominal pain. The examination revealed violations of acid-base balance in the direction of alkalosis and exacerbation of the disease.
A) Determine which drug the patient took.
B) Indicate the cause of complications and treatment tactics.
TASK 4. A 10-year-old ambulance delivered a child to the hospital for acute poisoning with acetic acid. The doctor injected subcutaneously with 0.1 ml of a 1% solution of apomorphine hydrochloride, made a gastric lavage with a 0.5% tannin solution and injected 10 g of activated charcoal into the stomach through a probe, however, the patient's condition worsened sharply, and symptoms of peritonitis and progressive acidosis appeared.
A) Describe the tactics of the doctor. B) Add your corrections to the treatment tactics.

6.3. Tests for self-control.

1. In a patient with diabetes mellitus, which was complicated by a hyperglycemic comma, ketoacidosis must be eliminated. Which drug solution, is intracellular buffer, should be prescribed?
A. Sodium bicarbonate solution B. Ringer's solution C. Trisamine
D. Solution of sodium lactate E. Neohaemodesis
2. Which of these drugs eliminates not only intracellular, but also extracellular acidosis?
A. Sodium bicarbonate solution B. Sodium hydroxide solution C. Trisamine
D. Sodium lactate solution E. Ammonium chloride solution
3. The patient was taken to the department, took a large dose of phenobarbital for suicidal purpose. Objectively: consciousness is absent, rare, shallow breathing, blood pressure 80/60 mm Hg, threadlike pulse. From laboratory data: respiratory metabolic acidosis. What drug is indicated for the correction of acid-base conditions?
A. A solution of sodium chloride B. A solution of calcium chloride
C. Sodium bicarbonate solution D. Potassium chloride solution E. Ammonium chloride solution

4. For a long time, a patient with collagenosis received prednisone at a dose of 30 mg per day. Recently, painful spasms of the skeletal muscles of the extremities have arisen. What can reduce these pains?
A. Ergocalciferol B. Tyrocalcitonin C. Diazepam D. Aminazine E. Panangin
5. What drugs are antagonists of magnesium ions and are used in cases of overdose of magnesium sulfate, administered parenterally?
A. Potassium B. Calcium C. Sodium D. Iron E. Bromine
6. When assisting with blood loss, is the drug administered only intravenously slowly?
A. Sodium Chloride Solution B. Calcium Chloride Solution C. Trisamine
D. Potassium chloride solution E. Ammonium chloride solution
7. With prolonged use of saluretics-thiazides in the treatment of hypertension, complications arose: muscle pain, arrhythmia. What is the best way to prevent these complications?
A. Asparkam B. Ammonium chloride C. Trisamine D. Calcium chloride E. Sodium chloride
8. What remedy will cause a serious complication (perforation, bleeding) when used internally with gastric ulcer?
A. Sodium bicarbonate B. Magnesium sulfate C. Chymotrypsin D. Calcium chloride
E. Sodium Chloride
9. It is necessary to treat a purulent wound. Which drug is better to choose?
A. Glucose 5% solution B. Potassium chloride 4% solution C. Sodium chloride 0.9% solution
D. Calcium chloride 10% solution E. Sodium chloride 10% solution
10. To reduce the toxic effects of silver nitrate on the oral mucosa, use:
A. Sodium chloride B. Sodium sulfate C. Chloramine D. Chlorhexedine. E hydrogen peroxide
11. For two weeks, the patient took a medicine intended by a neurologist for neurasthenia. The patient's state of health improved somewhat, but soon complaints of a runny nose, conjunctivitis, skin rashes, lethargy, and weak memory appeared. The diagnosis of bromism was established. What is appropriate to relieve symptoms?
A. Sodium chloride B. Glucose solution 5% C. Polyglukin D. Asparkam E. Unitiol
12. For poisoning with fluorine preparations, gastric lavage is prescribed.
A. Sodium bicarbonate B. Magnesium sulfate C. Potassium chloride D. Calcium chloride
E. Sodium Chloride
13. For remineralizing therapy for multiple caries by electrophoresis, you can enter:
A. Sodium bicarbonate B. Sodium chloride C. cobalt gluconate
D. Calcium gluconate E. Potassium chloride
14. In the treatment of periodontitis of the upper molar, the dentist performed drug and instrumental treatment of the root canals, but the medial and distal buccal canals were only 1/3 of their lengths. In this regard, the doctor applied the channel impregnation method with a 30% silver nitrate solution. When performing this procedure, the antiseptic got on the mucous membrane. What should be done to treat the oral mucosa in this case?
A. Sodium chloride solution 2% B. glucose solution 5% C. Soda solution 4%
D. A solution of calcium chloride 10% E. A solution of potassium chloride 10%
15. A 17-year-old girl took a large dose of phenobarbital for the purpose of suicide. Upon arrival at the scene, the ambulance doctor quickly washed his stomach, introduced bemegrid and sodium bicarbonate solution intravenously. Why did the doctor introduce sodium bicarbonate?
A. To increase renal excretion of phenobarbital B. To stimulate respiration
C. To normalize blood pressure D. To inactivate phenobarbital E. To awaken
16. For the prevention of caries, the dentist prescribed the drug inside. Identify the drug.
A. Sodium bicarbonate B. Sodium chloride C. Calcium chloride
D. Calcium citrate E. Potassium chloride
17. The patient has acute pancreatitis, urine diastase content is significantly increased. Is it necessary to include an agent from the group of proteolysis inhibitors in the complex therapy of this patient?
A. Contrikal V. Pancreatin S. Festal D. Digestal E. Mezim Forte

Content module 8	**Preparations of macro- and microelements. Enzyme and antiferment preparations. Plasma substitutes and preparations for parenteral nutrition. Medicines used for the treatment and prevention of diseases of hard tissues, tooth pulp and periodontal disease. Drugs that affect the metabolism of bone and cartilage. Antidotes.**
To the topic № 18	**Medicines used for the treatment and prevention of diseases of hard tissues, tooth pulp and periodontal disease. Drugs affecting the metabolism of bone and cartilage.**

1. Relevance of the topic: A prominent place in dentistry is occupied by the problems of treating patients with lesions of hard tooth tissues, oral mucosa, periodontal tissues and purulent-inflammatory processes in the maxillofacial region. Most of these diseases are due to the direct influence of various irritating factors on the oral mucosa and periodontium; the course of diseases largely depends on the state of the whole organism (the presence of other diseases, immune disorders, hypovitaminosis, metabolic disorders, etc.). An important principle in the treatment of diseases of the oral mucosa and periodontal tissues is complexity, that is, a combination of general and local methods of treatment in compliance with the sequence in the application of various types of therapy. The purpose of local treatment: elimination of the cause of the disease, elimination of the inflammatory process, restoration of the normal function of the oral organs. All drugs for local treatment must be used taking into account their pharmacological action, saliva pH, individually for each patient, taking into account the type, severity of the disease, the characteristics of the clinical course, as well as the general condition of the body. General treatment is carried out by a dentist compatible with other specialists (general practitioner, endocrinologist, neuropathologist) and is aimed at normalizing metabolic processes, increasing the body's defenses, eliminating or reducing the impact of a causative factor.

2. The educational goals:

1. Interpret indications for the use of agents that affect the structure of tooth hard tissues.
2. Explain the characteristics of the main pharmacological agents used to treat periodontal disease and tooth pulp.
3. Predict and prevent side effects of drugs that affect the structure of periodontal and pulp teeth.
4. Write out recipes and conduct a pharmacotherapeutic analysis of agents that affect the structure of hard tissues of the tooth.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Inorganic chemistry	Determine the properties of alkali and alkaline earth metal salts.
2. Biological chemistry	Depict the chemical formula of glucose, determine its properties.
3. Latin	Prescription writing skills.

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

PREPARATIONS

№	Name of the drug	Release form	Mode of application
1.	Diluted hydrogen peroxide solution Sol. Hydrogenii peroxydi diluta	Flak. 3% 40ml	An official solution for washing wounds, treating periodontal pockets
2.	Chlorhexidine bigluconate Chlorhexidinum bigluconas	Flak. 20% 500 ml	Dissolve in ethyl alcohol in a ratio of 1:40 for hand treatment to a

		Flak. 0.05% 100 ml	surgeon For greasing, rinsing, applications
3.	Sodium hypochlorite Sodium hypochlorite	Flak. 3% 100 ml	For processing correspondent. / channels
4.	Chlorophyllipt Chlorophyllipt	Flak. 1% alcohol Flak. 2% ol_yn.r-r Tab. d / sucking 0,025 Spray 15 ml	Locally, applications
5	Sanguirythrin Sanguiritrinum	Flak. 0.2% alcohol 50 ml	Locally as a 0.2% solution and a dilution of 1:40 (0.005% solution)
6.	Sodium Fluoride Sodium fluoride	Tab. 0.0011; 0.0022	Inside before going to bed after brushing your teeth. Children aged 2 to 5 years - 1 tablet (1.1 mg), from 5 years of age - 2 tablets (2.2 mg) per day
7.	Calcium citrate Calcium citrate	Tab. 0.5	Inside 0.5-1 g 3 times a day for 1-1.5 hours before or after meals
8.	Calcitonin Calcitonin	Amp. 1 ml (50 mo) Flak. 2 ml (100 MO) Flak. with aerosol 14 doses (1 dose - 200 MO)	Under the skin, in the muscles 5-10 mg / kg per day (50-100 IU per day) Intravenous drip at the rate of 5-10 mg / kg, diluted in 500 ml of 0.9% sodium chloride Intranasally, in several doses per day from 100-400 IU
9	Calcitriol Calcitriol	Caps 0.00000025, 0.0000005 g	Intrashnyo at 0.00000025-0.000002 g per day
10.	Methyluracil Methylura ilum	Tab. 0.5 g Suppositories 0.5 g Ointment 10% 25 g	Inside 0.5 g 4 times a day Enter rectally Lubricate the skin and mucous membranes

4.2. Theoretical questions for the lesson:

1. Pharmacology of drugs for the treatment of diseases of hard tissues and pulp of the tooth and periodontium.
2. Means for pulp devitalization (paraformaldehyde, arsenic anhydride). Mechanism of action, side effect.
3. Hemostatic agents for capillary bleeding (caprofer, hemostatic sponge, thrombin). Impregnating agents (silver nitrate, arginate). The mechanism of action. Possible complications and help.
4. Means for recalcification and stimulation of odontogenesis - odontotropny paste based on calcium hydroxide (calcemin, calxil, calcimol LC) and zinc oxide (zinc, zinc-eugenol, iodoform). Pharmacological characteristics, mechanisms of action and indications for use.
5. Antiseptics and dilators of tooth canals (sodium hypochlorite, citric acid, copropyl alcohol, hydrogen peroxide, chlorhexidine). Pharmacological characteristics, mechanisms of action and indications for use in dentistry.
6. Proteolytic enzymes (crystalline trypsin, terilithin, chymopsin, lsocim, ribonuclease). Mechanisms of action and indications for use in dentistry.
7. Pharmacology of drugs for the treatment of periodontal disease and oral mucosa (periodontitis, stomatitis): to increase the overall resistance to organisms (vitamin preparations, immunostimulants (methyluracil, nucleinate, Imudon, prodigiosan), calcium preparations (calcium glycerophosphate) to stimulate the regeneration of periodontal tissues (solcoseryl, insadol, calcitonin) and oral mucosal

epitalsis - keratoplastic (retinol, tocopherol acetate, aevit, aecol, carotolin, vinsol, vinylin) tissue biostimulants (actovegin, solcos r silt, aloe extract) astringents (tannin, oak bark, salvin), plant antiseptics (chlorophyllipt, sanguirythrin, rotokan, novimanin).
8. The principles of pharmacotherapy of purulent-inflammatory processes in the maxillofacial region. The use of antiseptics, chemotherapeutic antimicrobial agents (sulfonamides, antibiotics), enzymes and anti-enzymes, antihistamines.
9. Preparations for the treatment and prevention of osteoporosis anabolic steroids (nandrolone (retabolil) estrogens and estrogen-progestogen drugs, androgens; thyroid hormone (calcitonin) and its synthetic analogue; parathyroid hormone analogue (teriparatide) bisphosphonates (etidronic acid, kid acid, vitamin D preparations (ergocalciferol, cholecalciferol, dihydrotachysterol, calcitriol), calcium preparations (calcium carbonate, osteogenon), strontium preparations (strontium ranelate) and fluorine (sodium fluoride).

4.3. Practical tasks that are performed in preparation for the lesson:

4.3.1. Write down the prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Chlorhexidine bigluconate in vials 0.05%, 20% r.
2. Sodium hypochlorite.
3. Hydrogen Peroxide
4. Sodium fluoride
5. Calcium Citrate
6. Calcitriol
7. Calcitonin
8. Dioxomethyltetrahydropyrimidine (methyluracil) in tablets and ointments

4.3.2. Заполнить таблицу:

Preparations	Mechanism of action	Indications	Adverse reactions
1. Chlorhexidine bigluconate			
2. Sodium hypochlorite.			
3. Hydrogen Peroxide			
4. Sodium fluoride			
5. Calcium Citrate			
6. Calcitriol			
7. Calcitonin			
8. Methyluracil			

5. Practical tasks that are performed in class:

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration:

1. Antiseptic is a detergent.
2. Antiseptic - an oxidizing agent for washing the root canals
3. Antiseptic - halogen for washing the root canals.
4. Antiseptic - a surfactant.
5. Calcium preparation for caries prophylaxis.
6. Fluoride for caries prevention.

6. Materials for self-control.

6.3. Tests for self-control:

1. The patient was treated with a preparation to treat the surgical field; chemically, they are a dichloro-containing derivative of biguanides. The most active local antiseptic, has a quick and strong bactericidal effect on gram-positive and gram-negative bacteria. What is this drug?
A. Chlorhexidine V. Yodditserin S. Chloramine D. Chlorophyllipt E. Etonius
2. To determine the antiseptic, which is a halogen and a surfactant, is used to treat infected wounds, to disinfect non-metallic instruments, hands, and patient care items:
A. Chlorophyllipt B. Decamethoxin C. Chloramine D. Chlorhexidine E Furacilin
3. For filling the root canals of the upper molar, the doctor used a paste containing 2 antiseptics with a mummifying effect:
A. Camphor-phenolic mixture B. Phenol-formaldehyde mixture
C. A paste of arsenic acid D. A paste of etazol-anestezinov
E. Resorcinol-formalin paste
3. For a patient with catarrhal gingivitis, the doctor prescribed an antiseptic agent of plant origin. What is this drug?
A. Chlorophyllipt B. Decamethoxin C. Chloramine D. Chlorhexedine E Furacilin
4. For a patient with ulcerative necrotic gingivitis, the doctor prescribed a plant-derived antiseptic chlorophyllipt. Source of receipt?
A. Sage leaves B. Eucalyptus leaves C. Mokle grass D. St. John's wort grass E Chamomile flowers
5. The patient came to the dentist with complaints of pain, feeling of liver in clear from hot, sour, salty, sweet, bleeding gums during eating and brushing teeth. Diagnosis: acute catarrhal gingivitis. Choose a drug with an astringent mechanism of action:
A. Decoction of oak bark B. Halascorbin C. Chlorhexidine D. Bicarbonate E. Citral
6. Choose a drug for cauterizing erosion, excessive granulation and ulcers:
A. Silver nitrate B. Ethacridine C. Furatsilin D. Chloramine B E. Chlorhexidine
7. To reduce the toxic effects of silver nitrate on the oral mucosa, use:
A. Sodium chloride B. Sodium sulfate C. Chloramine D. Chlorhexidine. E. Hydrogen Peroxide
8. The patient has a purulent wound with necrotic contents. Should a wound cleanser be prescribed?
A. Furacilin B. Etonius C. Hydrogen peroxide D. Iodinol E. Chlorhexidine
9. To determine the antiseptic, which is the product of the polymerization of formaldehyde, is used in dental practice for necrotization of the pulp of the tooth as part of devitalizing pastes..
A. Resorcinol B. Ethanol C. Phenol D. Paraformaldehyde E. Thymol
10. The child has been diagnosed with a violation of the formation of enamel and dentin of the teeth due to the low-energy level of Ca 2+ ions in the blood. Can a hormonal drug be used to correct this condition?
A. Calcitonin B. Prednisolone S. Thyroxine D. Cortisone E. Somatotropin
11. With prolonged use of the drug, osteoporosis, erosion of the gastric mucosa, hypokalemia, sodium and water retention in the body, and a decrease in corticotropin in the blood may occur in a patient. Indicate this drug.
A. Prednisolone B. Indomethacin C. Digoxin D. Hypothiazide E. Reserpine
12. In the treatment of periodontitis, calcium and hormone preparations are used, it has the ability to stimulate tooth mineralization and inhibit bone resorption, namely:
A. Calcitonin V. Adrenaline S. Thyroxin D. Hormone E. Aldosterone
13. For remineralizing therapy of initial dental caries, an alkali metal salt was prescribed. Identify the drug.
A. Sodium fluoride B. Sodium bromide C. Potassium chloride
D. Sodium chloride E. Potassium bromide
14. For medical treatment of the root canals with periodontitis, the dentist used sodium hypochlorite. What group of antiseptics in chemical structure does this remedy belong to?
A. Metals Group B. Oxidizing agents C. Halogens D. Alcohols E. Detergents
15. In a child of the first year of life, an increase in the size of the head and abdomen, delayed teething, and a violation of the structure of enamel are observed. Vitamin drug should be prescribed?
A. Vikasol B. Decamevit C. Ergocalciferol D. Cyanocobolamine E. Retinol acetate

16. In the treatment of periodontitis, a preparation from the group of water-soluble vitamins, a derivative of bioflavonoids, which is prescribed together with ascorbic acid, was included in the complex of preparations. The drug has antioxidant properties, reduces bleeding gums. What is this drug?
A. Rutin B. Decamevit C. Calcium pangamate D. Cyanocobalamin E. Folic acid
17. A 55-year-old woman went to the doctor to prevent osteoporosis. Vitamin drug should be prescribed?
A. Cyanocobalamin B. Folic acid C. Retinol acetate
D. Ergocalciferol E. Vikasol
18. A patient with radiation sickness with skin lesions was prescribed complex therapy. Leukopoiesis stimulator need to be appointed locally?
A. Methyluracil B. Pentoxyl S. Levamsol D. Sodium nucleinate E. Timalin

Content module № 8	**Preparations of macro- and microelements. Enzyme and antiferment preparations. Plasma substitutes and preparations for parenteral nutrition. Medicines used for the treatment and prevention of diseases of hard tissues, tooth pulp and periodontal disease. Drugs that affect the metabolism of bone and cartilage. Antidotes.**
To the topic № 19	**Principles of treatment of acute poisoning. Principles of antidote therapy. Antidote drugs.**

1. Relevance of the topic. The widespread use of a variety of chemicals in medical practice, everyday life, the high tension of the rhythm of life, the growth of alcoholism, substance abuse, drug addiction, nervous and mental diseases create the prerequisites for the occurrence of acute poisoning, including drugs. Acute poisoning is characterized by a sudden onset, polymorphic of clinical manifestations, rapid dynamics and a fairly frequent development of critical conditions. A characteristic feature of critical conditions in acute poisoning is the involvement in the pathological process of tissues, organs and systems, to which the selective effect of the poison does not apply. In deep comma and shock, the toxicokinetics of poisons is disturbed, and the period of their half elimination from the blood increases. In this regard, the treatment of a patient with moderate and severe acute poisoning is multi-faceted, including with the use of medical therapy. At the same time, timely and adequate treatment in most cases guarantees the saving of life and the return of health to patients who have been poisoned.

2. The educational goals:

1.To generalize and analyze the basic principles of the pharmacotherapy of acute drug poisoning and the causes of acute poisoning.
2.Interpret symptoms of poisoning by various substances..
3.Know the pharmacological characteristics of drugs used in extreme conditions.
4.Create an algorithm for helping patients with poisoning.
5.Write down and analyze recipes for antidotes.
6.Write down recipes and make pharmacotherapeutic analysis of prescribed drugs that are used to treat acute poisoning.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Latin	Own prescription skills.
2. Pathological physiology	Apply knowledge from the violation of physiological processes during intoxication with various agents.
3. Biological chemistry	Know the biochemical metabolic reactions in the human body

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
Dialysis	Removal of low molecular weight substances from solutions of colloidal and high molecular weight substances, based on the property of semipermeable membranes to transmit low molecular weight substances and ions, with pore sizes up to 50 nm, and to retain colloidal particles and macromolecules.
Sorption	The absorption of gas molecules, vapors or solutions by the surface of a solid or liquid.
Substitution	Substitution of a biological fluid that contains toxic substances with another similar biological fluid or artificial medium in order to remove toxic substances from the body
Antidote	A drug that, when introduced into the body under conditions of acute intoxication, can neutralize (inactivate) a toxic substance that circulates in the bloodstream or is associated with a biological substrate, eliminate its toxic effect, or accelerate elimination from the

	body.

PREPARATIONS

№	Name of the drug	Release form	Mode of application
1	Unitiol Unithiolum	Amp. 5% 5 ml	In the muscles, under the skin (0.05 g per 10 kg of patient's body weight)
2	Sodium Thiosulfate Natrii thiosulfas	Amp. 30% 5, 10 and 50ml	Intravenously
3	Methylene blue Methyienum coeruleum	Amp. 1% 20 and 50 ml	Intravenously
4	Acetylcysteine Acetylcysteinum	Amp. 10% 2 ml Amp. 5% 10 ml	Intra's Intravenously 10 ml
5	Aloxim Alloximum	Amp. 0.075 g	Intramuscularly, intramuscular 0.075 g
6	Dipiroxim Dipiroximum	Amp. 15% 1 ml	Subcutaneously, in veins 0.15 g (1 ml)
7	Desferal Desferal	Flak. 0.5 g	Intramuscularly, intramuscular 0.5–1.0 g
8	Tetacin calcium Tetacinum-calcium	Amp. 10% 10 and 20 ml	Intravenously
9	Naloxone Naloxonum	Amp. 1 ml	1-8 ml intravenously
10	Penicylamine (cuprenyl) Penicillaminum (Cuprenilum)	Caps. (tab.) 0.15 and 0.25 g	Inside 0.3-0.75 g 3 times a day
11	Furosemide Furosemidum	Amp. 1% 2 ml	Intravenously 0.1-0.15 mg

4.2. Theoretical questions for the lesson:

1. The basic principles of pharmacotherapy of acute drug poisoning.
2. Causes of acute poisoning.
3. Symptoms of acute poisoning with drugs of various pharmacological groups.
4. Methods of active detoxification, the use of emetic, laxatives, enveloping, astringents and adsorbents.
5. The use of active diuretics to remove toxic substances from the blood (forced diuresis), the use of hemodialysis, peritoneal dialysis, hyperbaric oxygenation, hemo-and lymphosorption.
6. The concept of antidotes. Types of antidote therapy.
7. Pharmacology of unithiol, acetylcysteine, tetacin-calcium, penicillamine, deferoxamine, cholinesterase reagents - aloxime.
8. Treatment of an overdose of opioids, tranquilizers from the group of benzodiazepine derivatives, alcohol.
9. Principles of symptomatic therapy of acute poisoning.

4.3. Practical tasks performed in preparation for the lesson:

4.3.1. Write down the prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Unitiol in ampoules.
2. Acetylcysteine in ampoules.
3. Aloxim in ampoules.
4. Furosemide for forced diuresis in ampoules.
5. Methylene blue in ampoules.
6. Desferal in vials.

7. Calcium tetacin
8. Naloxone in ampoules.

4.3.2. Fill in the table:

Preparations	Mechanism of action	Indications for use	Adverse reactions
1. Unitiol			
2. Acetylcysteine			
3. Aloxim			
4. Furosemide			
5. Methylene blue			
6. Desferal			
7. Calcium tetacin			
8. Naloxone			

4.3.3. Solve test items:

1. A patient got into the hospital, accidentally took a liquid inside, after which he had pain in the abdomen, in the esophagus, and vomiting. Diarrhea appeared with traces of blood. Hyperemia of the mucous membranes of the mouth, bleeding of the gums, metallic taste in the mouth, and lymph glands are noted. After 2-3 days, signs of renal failure appeared. What caused the poisoning?

A. Furatsilin B. Ethyl alcohol C. Boric acid D. Atropine sulfate

E. * Heavy metal salts

2. A 38-year-old man who was poisoned by a sublimate was delivered to the emergency department in serious condition. What antidote should be administered to the patient quickly?

A. Dipiroksim B. Atropine C. Nalorfin D. Isonitrosine E. * Unitiol

3. A patient with syphilis during treatment with bismuth preparations has gray spots on the oral mucosa and symptoms of nephropathy. What remedy is used as an antidote for bismuth poisoning?

A. * Unithiol B. Atropine C. Nalorfin D. Isonitrosine E. Dipiroxim

4. The patient, 35 years old, with complaints of severe pain in the epigastric region on an empty stomach and heartburn, the doctor prescribed a drug of the group of H 2 receptor blockers. What is this drug?

A. * Famotidine B. Atropine C. Almagel D. Metacin E. Vicalin

5. The patient during tooth filling, arsenic paste accidentally hit the mucous membrane of the cheek. What antidote should be introduced to this patient to prevent a possible resorptive toxic effect of arsenic?

A. * Unithiol B. Activated carbon C. Sodium thiosulfate

D. Tetacin-calcium E. EDTA |

6. A patient, 60 years old, suffered a myocardial infarction, and acetylsalicylic acid was prescribed for a long time in small doses. What is the mechanism of action of this drug used?

A. * Blockade of the cyclooxygenase enzyme B. Blockade of the acetylcholinesterase enzyme

C. Blockade of the enzyme phospholipase D. Blockade of the enzyme lipoxygenase

E. Phosphodiesterase Enzyme Blockade

7. In the case of a medical acute allergic condition, the patient is prescribed an antihistamine and a drug that does not have a sedative effect on the central nervous system and lasts a long time. What is this drug?

A. Suprastin B. * Loratadin C. Diprazine D. Diphenhydramine E. Tavegil

8. What drug for the correction of the acid-base state should be administered to the patient in case of poisoning with derivatives of barbituric acid (barbiturates)?

A. A solution of arginine hydrochloride B. * A solution of sodium bicarbonate C. Vitamins

D. Antibiotics E. Saline

9. Specific antagonist of narcotic analgesics:

A. Bemegrid B. Strychnine C. * Naloxone D. Caffeine E. Etymizole

10. A drug from the group of salts of heavy metals, which are used as an antidote for phosphorus poisoning:

A. Bismuth subcitrate B. Silver nitrate C. Aluminum oxide D. * Copper sulfate
E. Zinc sulfate

5. Practical tasks that are performed in class

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration*:*

1. Antidote for poisoning with salts of heavy metals and cardiac glycosides.
2. The antidote for poisoning with iron preparations and the treatment of hemochromatosis.
3. Antidote for the poisoning of dichloroethane, salts of heavy metals, paracetamol.
4. Antidote for poisoning with anticholinesterase substances.
5. Antidote for drug poisoning.
6. Antidote for hydrocyanic acid poisoning.
7. Antidote for methyl alcohol poisoning.
8. Antidotes for poisoning with strong alkalis and acids.
9. A diuretic for conducting forced diuresis in case of poisoning.
10. Plasma substitute for forced diuresis in case of poisoning.

Theme Algorithm:

The main methods of detoxification of the body:

I. Methods of enhancing the natural detoxification of the body:
- gastric lavage
- bowel cleansing
- forced diuresis
- therapeutic hyperventilation

II. Methods of artificial detoxification of the body:

Intracorporeal:	Extracorporeal
- peritoneal dialysis	- hemodialysis
- intestinal dialysis	- hemosorption
- gastrointestinal sorption	- plasma sorption
	- lymphorrhea and lymphosorption
	- blood substitution
	- plasmapheresis

III. Methods of antidote detoxification:
- chemical antidotes (contact action, parenteral action)
- biochemical
- pharmacological antagonists

6. Materials for self-control.

6.1. The task for self-control.

Using textbooks and teaching aids, fill out the following tables:

No. 1. Fill in the table “The choice of drugs and methods of detoxification of the body in case of poisoning with different substances”.

Poisoning	Preparations, detoxification methods				
	Reactivator Cholinesterase	Unitiol	Acetylcysteine	Ethanol	Forced diuresis
Heavy metal salts					
Methanol					
Atropine					
Sleeping pills					
Paracetamol					
FOS					

Alcohol					

6.2. Tasks for self-control:

TASK 1. A patient who complains of chronic heart failure was prescribed digitoxin. However, a week after the start of the drug, the patient developed symptoms of drug intoxication (bradycardia, nausea, extrasystole).

A) What measures of assistance should be applied during intoxication, indicate the principles of their action.

B) What methods of artificial detoxification can be used?

TASK 2. A patient with symptoms of fly agaric poisoning was admitted to the hospital.

A) Indicate methods of enhancing the natural detoxification of the body in this condition

B) What medicines should be prescribed to the patient as antidote therapy?

B) Indicate the type of interaction of muscarin (fly agaric alkaloid) and the drug of your choice.

TASK 3. The patient was diagnosed with poisoning with salts of heavy metals.

A) Indicate the antidote.

B) What is the name of this type of drug interaction?

6.3. Tests for self-control.

1. A patient with mercury poisoning was delivered from the chemical production to the toxicology department, which antidote should be used in this situation?

A. Unithiol B. Activated Carbon C. Naloxone D. Isonitrosine

E. Enterosorbent SKN

2. A patient was admitted to the emergency department with the following symptoms: miosis, hypersalivation, sweating, bronchospasm, vomiting and diarrhea. The diagnosis was made: poisoning with organophosphorus compounds. What drugs should be included in complex therapy?

A. Atropine sulfate and dipyroxime B. Sodium thiosulfate and bemegrid

C. Nalorfin hydrochloride and bemegrid D. Glucose and bemegrid E. Panangin and unitiol |

3. Indicate the antidote used in case of overdose of cardiac glycosides.

A. Unithiol B. Atropine C. Nalorfin D. Isonitrosine E. Dipiroxim

4. A nurse mistakenly injected a nearly double dose of insulin into a patient with diabetes, which led to a hypoglycemic coma. Is it necessary to administer the drug to the patient in order to withdraw it from the coma?

A. Insulin B. Lidase C. Adrenaline hydrochloride D. Growth hormone

E. Norepinephrine hydrotartrate

5. A patient with syphilis during treatment appeared gray spots on the mucous membrane of the oral cavity and symptoms of nephropathy. These side effects were eliminated after the use of unitiol. What drugs caused these side effects?

A. Bismuth preparations B. Penicillins antibiotics C. Macrolides antibiotics

D. Antibiotics-tetracyclines E. Nitrofurans

6. For patients with urticaria, diphenhydramine is prescribed to eliminate complications in the form of Quincke's edema. What mechanism ensures its effectiveness in this case?

A. Competitive blockade of H 1 receptors B. Inhibition of histamine synthesis

C. Inhibition of histamine release D. Acceleration of histamine destruction

E. Independent histamine antagonism

7. When working with a mercury solution, the drug accidentally fell on the patient's mucous membrane and skin. What antidote should be introduced to the patient to prevent a possible general toxic effect of arsenic?

A. Adsorbent B. M-anticholinergics C. Cholinesterase reagents

D. Analeptics E. Donor of CH groups

8. The drug, which is used for poisoning with chlorophos:

A. Dipiroksim B. Unithiol C. Spironolactone D. Proserin E. Strychnine

9. A 17-year-old girl took a large dose of phenobarbital for the purpose of suicide. After arriving at the scene, the ambulance doctor quickly washed his stomach, injected bemegrid and sodium bicarbonate solution intravenously. Why did the doctor introduce sodium bicarbonate?
A. To increase renal excretion of phenobarbital B. To stimulate respiration
C. To normalize blood pressure D. To inactivate phenobarbital E. To awaken
10. In order to improve the process of falling asleep, the patient took several phenobarbital tablets. Soon he lost consciousness, blood pressure decreased, breathing weakened. What specific antagonist should be used?
A. Bemegrid B. Lobelin C. Nalorfin D. Caffeine E. Etymizole
11. The patient as a result of material cumulation of barbiturates showed signs of intoxication. What drugs can lower the concentration of barbiturates in the central nervous system?
A. Sodium bicarbonate B. Sodium chloride C. Potassium chloride
D. Magnesium oxide E. Magnesium sulfate
12. A patient with symptoms of acute morphine poisoning was admitted to the intensive care unit: he lost consciousness, hypothermia, Cheyne-Stokes breathing, hypotension, bradycardia, and severe myosis. Which of the following drugs will be most effective in this situation?
A. Naloxone B. Cordiamine C. Camphor D. Etymisole E. Caffeine
13. A patient with signs of acute morphine poisoning was admitted to the intensive care unit. What is the best remedy for gastric lavage?
A. Potassium permanganate B. Sodium bicarbonate C. Furatsilin D. Tannin
E. Boric acid
14. What drug should be used to restore breathing when exiting against an overdose of tubocurarine |?
A. Proserin B. Cordiamine C. Lobelin D. Plasma E. Caffeine
15. During anesthesia, the anesthetist exceeded the dose of tubocurarine chloride. The patient was prescribed proserin. What is the effect of this drug based on?
A. Decrease in cholinesterase concentration B. Increase in cholinesterase concentration
C. Blockade of the presynaptic membrane D. Activation of M-cholinergic receptors
E. Adrenergic blockade
16. Indicate a means to remove poison from the gastrointestinal tract in case of acute poisoning in case the poison is water-soluble and injured in consciousness.
A. Sodium sulfate B. Bisacodyl C. Isafenin D. Rhubarb tablets E. Vaseline oil
17. A patient with alcohol poisoning was admitted to the admission department. The doctor prescribed a forced diuresis for the patient. Which diuretic should i use?
A. Furosemide B. Spironolactone C. Diacarb D. Eufillin E. Amyloride
18. A patient with symptoms of acute pancreatitis was hospitalized in the surgical department of the hospital: severe girdle pain in the abdomen, vomiting, diarrhea, dehydration and hypotension. What anti-enzyme drug should be prescribed to the patient?
A. Contrical B. Adrenaline hydrochloride C. Atropine sulfate D. Analgin
E. Sodium bicarbonate
19. A patient who was poisoned with a drug with high cumulative properties was admitted to the admission department. The patient has severe bradycardia, blockade, ventricular extrasystoles, hallucinations, delirium, macropsy, oliguria. What group was poisoned by?
A. Antianginal B. Anticholinesterase C. Cardiac glycosides
D. Antidepressants E. Antipsychotics
20. The patient during the course of treatment with nitrofuran consumed a small amount of alcohol, resulting in acute poisoning. Explain the cause of poisoning.
A. Accumulation of acetaldehyde B. Allergic reaction C. Neurological disorder
D. Cardiovascular failure E. Impaired renal function
21. Chelating agents that are capable of creating stable, slightly dissociated complexes with toxic substances include all drugs EXCEPT:
A. Unithiol B. Calcium tetacin C. Pentacin D. Penicillamine E. Deferoxamine

22. A patient with signs of poisoning with organophosphorus compounds was prescribed a drug from the group of cholinesterase reagents. Identify this drug.
A. Aloxim B. Deferoxamine C. Nalorfin D. Atropine E. Adrenaline
23. Determine the antidote for poisoning with iron preparations and the treatment of hemochromatosis.
A. Aloxim B. Deferoxamine C. Nalorfin D. Atropine E. Adrenaline
24. In the admission department in the patient submitted with complaints of dry mouth, photophobia and visual impairment. The skin is hyper-directed, dry, pupils dilated, tachycardia. With further surveillance, the diagnosis was established: poisoning with belladonna alkaloids. Which drug is appropriate to use?
A. Pilocarpine B. Diazepam C. Proserin D. Armin E. Dipiroxim
25. A patient with coronary heart disease, in order to eliminate angina attacks, repeatedly took the drug during the day, which subsequently caused poisoning due to an overdose. Objectively: cyanosis of the skin and mucous membranes, a sharp decrease in blood pressure, tachycardia, respiratory depression. The blood contains an increased content of methemoglobin. What group was the patient taking the drug?
A. Adenosine preparations B. Myotropic antispasmodics
C. Calcium channel blockers D. Organic nitrates E. Alpha blockers
26. For two weeks, the patient took a potion intended by a neurologist for neurasthenia. The patient's state of health improved somewhat, but soon complaints of runny nose, conjunctivitis, skin rashes, lethargy, and weak memory appeared. The diagnosis of bromism was established. What is appropriate to relieve symptoms?
A. Sodium chloride B. Glucose solution 5% C. Polyglukin D. Asparkam E. Unitiol
27. In a patient with myasthenia gravis, after administration of proserin, nausea, diarrhea, twitching of the muscles of the tongue and muscles of the extremities appeared. How can you stop intoxication?
A. Isadrine B. Physostigmine C. Pyridostigmine D. Mesatone E. Metacin
28. In the treatment of periodontitis of the upper molar, the dentist performed drug and instrumental treatment of the root canals, but the medial and distal buccal canals were only 1/3 of their lengths. In this regard, the doctor applied the channel impregnation method with a 30% silver nitrate solution. When performing this procedure, the antiseptic got on the mucous membrane. How to treat the mucous membrane of the oral cavity in this case?
A. A solution of sodium chloride 2% B. A solution of glucose 5% C. A solution of soda 4%
D. A solution of calcium chloride 10% E. A solution of potassium chloride 10%

Content module 8	**Preparations of macro- and microelements. Enzyme and antiferment preparations. Plasma substitutes and preparations for parenteral nutrition. Medicines used for the treatment and prevention of diseases of hard tissues, tooth pulp and periodontal disease. Drugs that affect the metabolism of bone and cartilage. Antidotes.**
To the topic № 20	**Principles for the treatment of emergency conditions.**

1. Relevance of the topic. A doctor of any specialty may encounter emergency situations in his practice. By this term is understood the acute development of a pathological process that poses a threat to the life of the patient. Emergency conditions remain one of the main causes of death, often in connection with untimely and unqualified medical care. Therefore, the doctor must not only diagnose an emergency and its most dangerous manifestations, but also draw up a treatment program taking into account the pharmacokinetics and pharmacodynamics of drugs.

2. The educational goals

1. To generalize and analyze the basic principles of pharmacotherapy of emergency conditions.
2. Know the pharmacological characteristics of drugs used in emergency conditions, principles of administration and route of administration of drugs.
3. Create an emergency care algorithm for patients.
4. Write out recipes and make pharmacotherapeutic analysis of prescribed drugs used in emergency conditions.

3. Interdisciplinary integration

Names of previous disciplines	Acquired skills
1. Latin	Own prescription skills.
2. Pathological physiology	Know the pathogenesis and morphology of emergency conditions
3. Biological chemistry	Know the biochemical metabolic reactions in the human body

4. Tasks for independent work in preparation for the lesson.

4.1. A list of basic terms, parameters, characteristics that a student must learn in preparation for the lesson:

Term	Definition
Emergency conditions	The acute development of a pathological process that poses a threat to the life of the patient.

PREPARATIONS

№	Name of the drug	Release form	Mode of application
1	Promedol Promedolum	Amp. 1% 1ml	1 ml intravenously
2	Diazepam Sibazonum	Amp. 0.5% 2ml	2 ml intravenously
3.	Sodium Caffeine Benzoate Coffeinum - natrii benzoas	Amp. 10% 1ml	Under the skin 1-2ml
4.	Epinephrine hydrochloride Adrenalini hydrochloridum	Amp. 0.1% 1ml	Under the skin 0.5 ml
5	Mezaton Mesatonum	Amp. 1% 1ml	1 ml intravenously
6.	Atropine sulfate Artopini sulfas	Amp. 0.1% 1ml	1 ml intravenously
7.	Korglikon	Amp. 0.6% 1ml	Intravenously 1 ml in 10 ml of

	Corglyconum		physical. district
8.	Nitroglycerine Nitroglycerinum	Tab. 0,0005 g	Under the tongue, 0.0005 g each
9	Prednisone Prednisolonum	Amp. 3% 1ml	1 ml intravenously
10	Magnesium sulfate Magnii sulfas	Amp. 25% 10ml	Intravenously, in the muscles 5-10ml

4.2. Theoretical questions for the lesson:

1. The basic principles of pharmacotherapy of emergency conditions with drugs.
2. Pharmacotherapy of emergency conditions at the reception in the dental office.
3. A set of drugs in the dental office for emergency care.
4. Pharmacotherapy of acute vascular insufficiency (fainting, collapse, shock).
5. Pharmacotherapy for pain with myocardial infarction and cardiogenic shock.
6. Pharmacotherapy of acute left and right ventricular (cardiac asthma, pulmonary edema) insufficiency.
7. Principles of pharmacocorrection of acute cardiac arrhythmias.
8. The principles of pharmacotherapy of cerebrovascular accidents and cerebral edema.
9. Pharmacotherapy of hypertensive crises.
10. Pharmacotherapy for an attack of angina pectoris.
11. Pharmacotherapy of an asthmatic attack and an asthmatic condition.
12. Pharmacotherapy for asphyxiation and respiratory arrest.
13. Pharmacotherapy of anaphylactic shock.
14. Pharmacotherapy for seizures and pharmacotherapy for colic.
15. The principles of pharmacotherapy of hyperglycemic and hypoglycemic coma.
16. Pharmacotherapy of acute thrombosis and bleeding.
17. Pharmacotherapy of hole bleeding after tooth extraction.

4.3. Practical tasks performed in preparation for the lesson:

4.3.1. Write down prescriptions and conduct their pharmacotherapeutic analysis (indicate group affiliation, indications for use, possible complications):

1. Promedol
2. Diazepam
3. Caffeine-benzoate sodium
4. Adrenaline hydrochloride
5. Mesaton
6. Atropine sulfate
7. Korglikon
8. Nitrogycerin
9. Prednisone
10. Magnesium sulfate

4.3.2. Заполнить таблицу:

Preparations	Mechanism of action	Indications for use	Adverse reactions
Promedol			
Diazepam			
Sodium Caffeine Benzoate			
Epinephrine hydrochloride			
Mezaton			
Atropine sulfate			
Korglikon			
Nitrogycerin			
Prednisone			
Magnesium sulfate			

5. Practical tasks that are performed in class

5.1. Get acquainted with the preparations of the training collection on the topic, determine their belonging to the pharmacological group and indications for use.

5.2. Justify the choice of the drug, its dosage form, dosage, concentration and route of administration:

1.Analeptics during collapse.
2. Adrenomimetic at collapse.
3. Adrenomimetic with anaphylactic shock.
4. Hormonal drug for anaphylactic shock.
5. The drug to eliminate hypertensive crisis.
6. The drug to eliminate an attack of angina pectoris.
7. The drug to eliminate heart block.
8. The drug to eliminate renal colic.
9. The drug to eliminate pain shock.
10. The drug to eliminate seizures.
11. The drug for acute heart failure.

6. Materials for self-control.

6.1. Tasks for self-control.

Table 1. Fill in the table "Choice of drugs for emergency conditions".

Emergency	Preparations
Anaphylactic shock	
Collapse	
Angina attack	
Hypertensive crisis	
Court attack	
Bronchospasm	
Hole bleeding	

6.2. Tasks for self-control:

TASK 1. Student S., first went into the operating room, suddenly felt weak, dizzy. Sweating intensified, limbs numb. The pulse is small, slow, weak filling. Blood pressure is low. The breath is shallow. The pupils are dilated, responsive to light. Tendon reflexes are not changed.

A) What condition did the patient have?

B) What assistance measures should be applied.

TASK 2. Patient N., 32 years old, during anesthesia at the dentist's office, had a pale face with drops of sweat, breathing became superficial, frequent, with convulsive muscle contractions, pressure dropped sharply.

A) What condition did the patient have?

B) What assistance measures should be applied.

TASK 3. In anticipation of a dentist, the patient was very worried. Entering the office, he suddenly lost consciousness. Objectively: pallor of the skin, weak pulse, 84 beats per minute, blood pressure 100/60 mm Hg

A) What is the pathological condition of the broom in painful?

B) What drug therapy should be used?

TASK 4. The dentist, before carrying out the extirpation of the tooth, introduced the patient a 0.25% solution of novocaine for local anesthesia. Suddenly, the patient had a sensation of fever, hyperemia, pain behind the sternum, breathing became difficult (characteristic of bronchospasm). The patient lost consciousness.

A) What reaction developed in the patient?

B) What drug should be used in the treatment of this condition?

C) what was needed to prevent its development?
OBJECTIVE 5. A 63-year-old patient in the treatment of pulpitis suddenly felt pain behind the sternum, which was radiating to the left arm and felt under the left shoulder blade. The taken Validol tablet did not bring relief. To the proposal of the dentist to take nitroglycerin, the patient replied that this drug was intolerant.
A) What is the patient's emergency?
B) What drugs can be used other than those mentioned?
TASK 6. The extraction of the tooth was traumatic with damage to the gums and the adjacent area of the mucous membrane of the oral cavity, tamponade of the hole with iodoform turunda appeared to be ineffective.
A) What funds should be used to stop bleeding?
B) What drugs should be used to prevent bleeding in the future?

6.3. Tests for self-control.

1. A nurse mistakenly injected a nearly double dose of insulin into a patient with diabetes, resulting in a hypoglycemic coma. Is it necessary to administer the drug to the patient in order to withdraw it from the coma?
A. Insulin B. Lidase C. Adrenaline D. Somatotropin
E. Norepinephrine
2. For patients with urticaria, diphenhydramine is prescribed to eliminate complications in the form of Quincke edema. What mechanism ensures its effectiveness in this case?
A. Competitive blockade of H 1 receptors
B. Inhibition of histamine synthesis
C. Inhibition of histamine release
D. Acceleration of the destruction of histamine
E. Independent histamine antagonism
3. A patient with symptoms was hospitalized in the surgical department of the hospital
acute pancreatitis: severe girdle with abdominal pain, vomiting,
diarrhea, dehydration and hypotension. What anti-enzyme drug should be prescribed to the patient?
A. Contrical B. Adrenaline C. Atropine sulfate D. Analgin
E. Sodium bicarbonate
4. A patient with coronary heart disease, in order to eliminate angina attacks, repeatedly took the drug during the day, which caused a sharp decrease in blood pressure, tachycardia, respiratory depression. What group was the patient taking the drug?
A. Preparations of adenosine series B. Myotropic antispasmodics
C. calcium channel blockers D. Organic nitrates
E. Alpha blockers
5. In acute thrombosis, anticoagulant therapy is intended. Identify a direct-acting anticoagulant that is used for thrombosis.
A. Dipyridamole B. Phenylin C. Sodium citrate D. Heparin
E. Pentoxifyline
6. Initially, a means for treating atrioventricular block:
A. Metoprolol B. Potassium chloride C. Quinidine sulfate D. Atropine sulfate
E. Amiodarone
7. The patient was admitted to a hospital with acute cardiovascular failure. What drug should be used in this case?
A. Digitoxin B. Digoxin in tablets C. Strofantin D. Adrenaline
E. Amiodarone
8. A 20-year-old patient at the dentist's office complained of a sharp pain in his heart, felt from fear. The doctor gave him a pill under his tongue and after a few seconds the pain disappeared. What reflex drug did the patient take?
A. Analgin V. Nitrazepam S. Nitroglycerin D. Validol
E. Anaprilin

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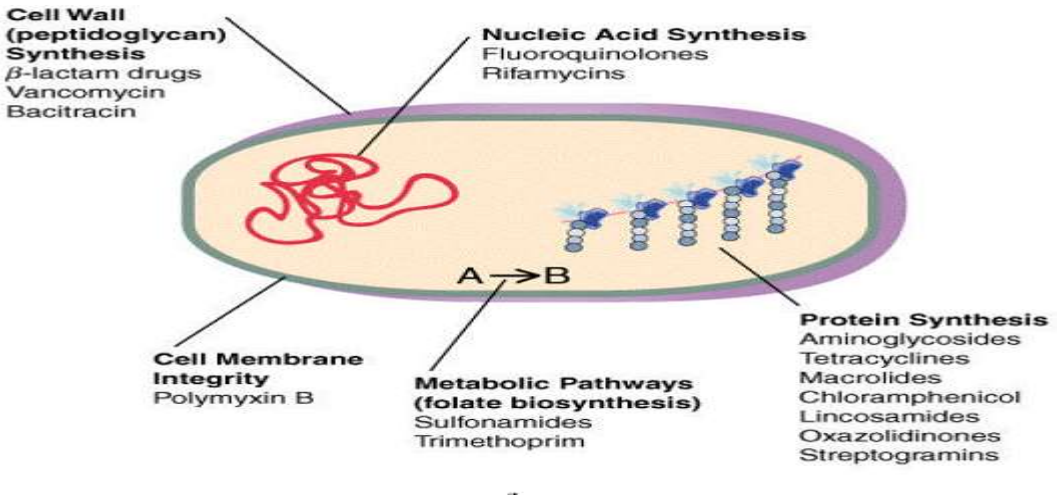
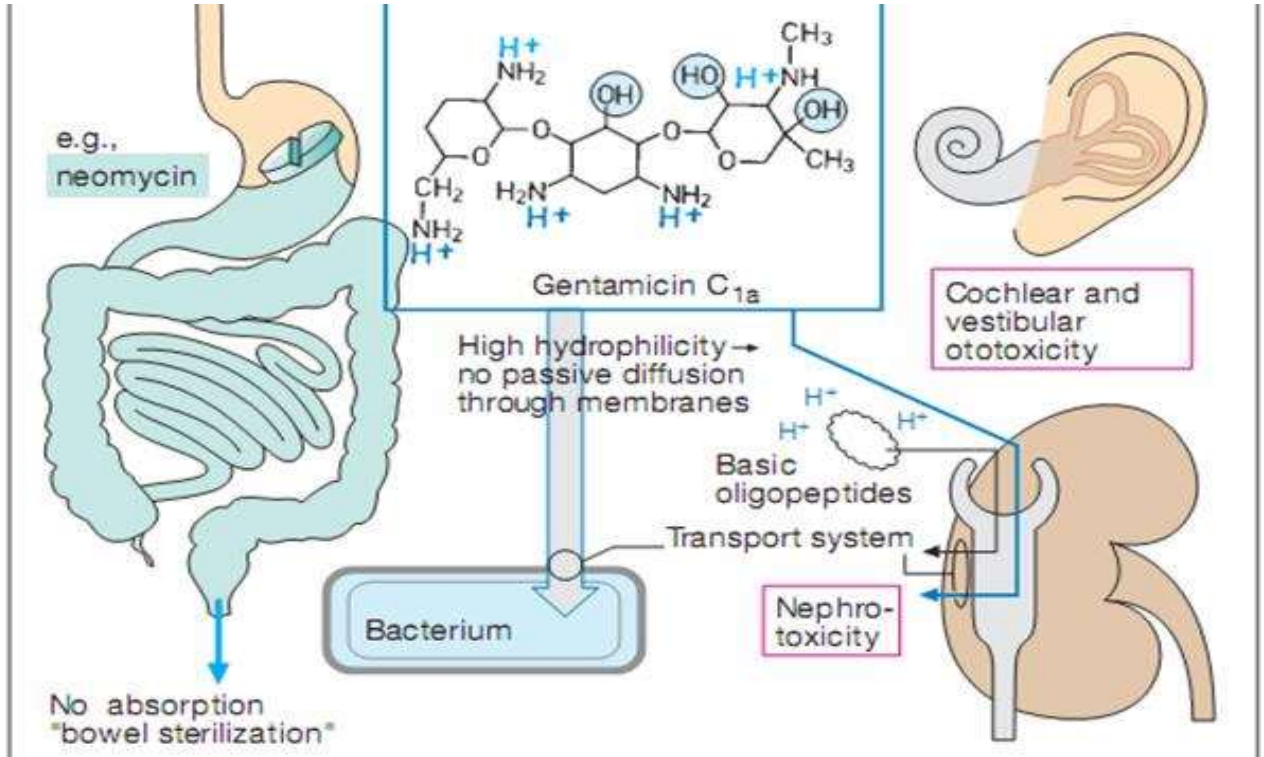
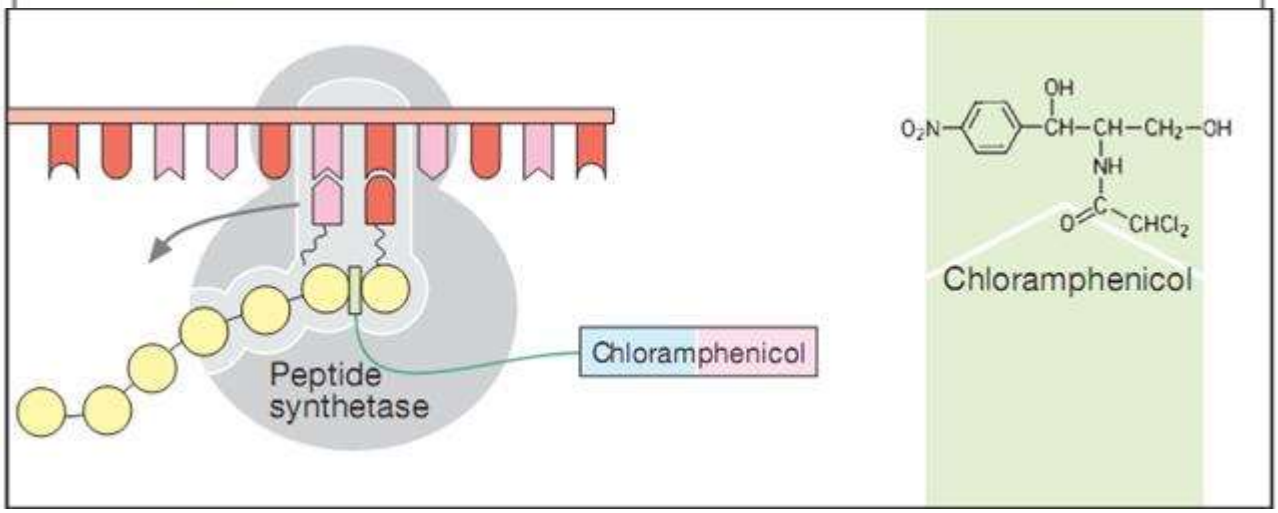
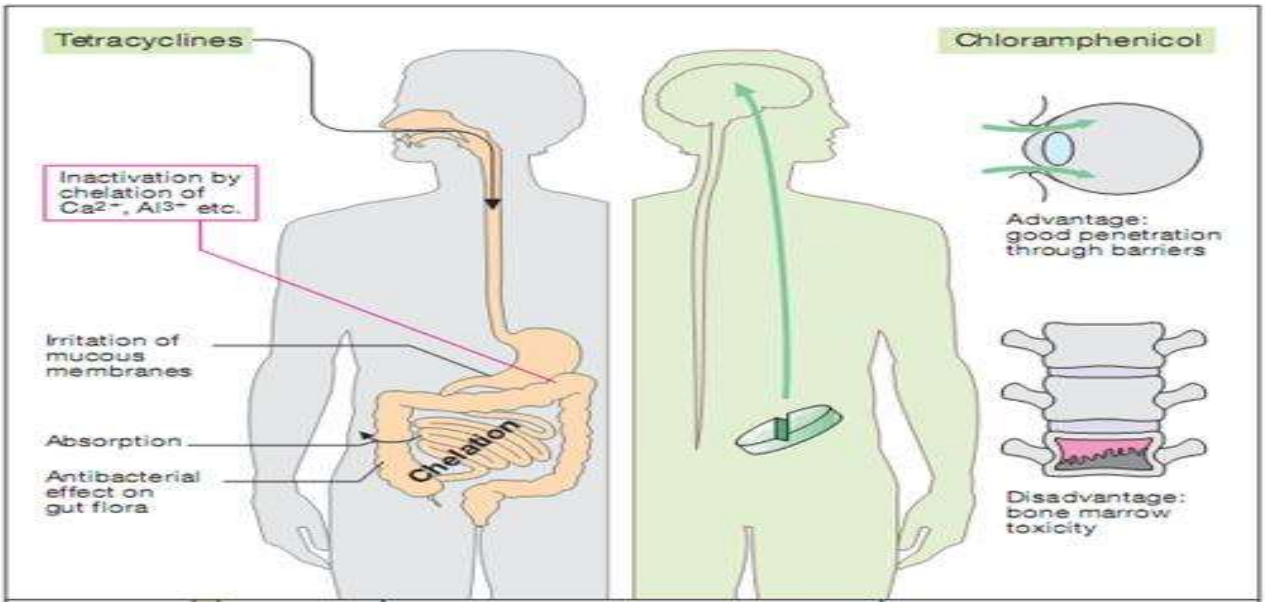
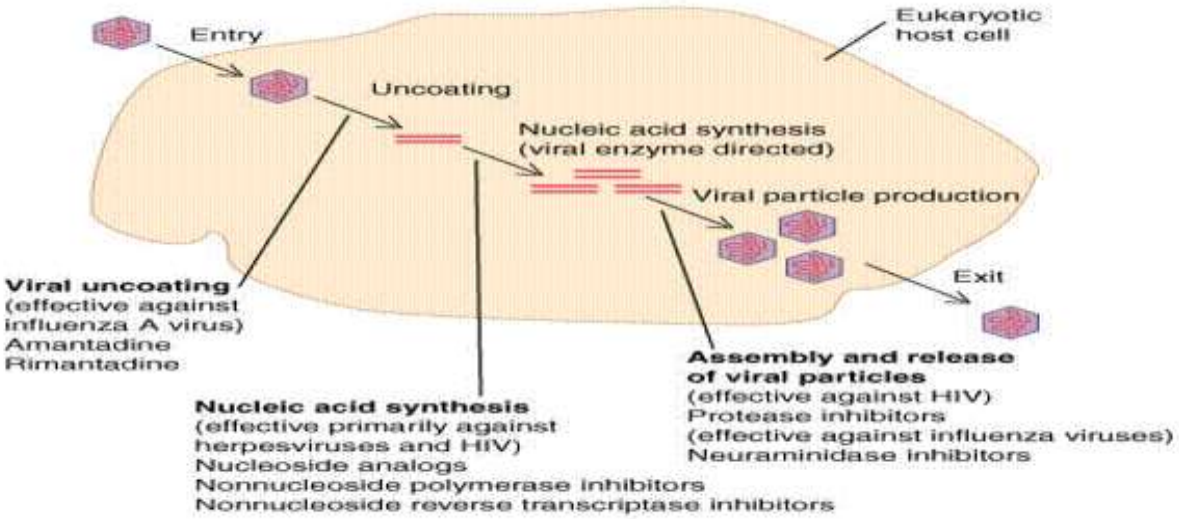
Graph of logical structure.

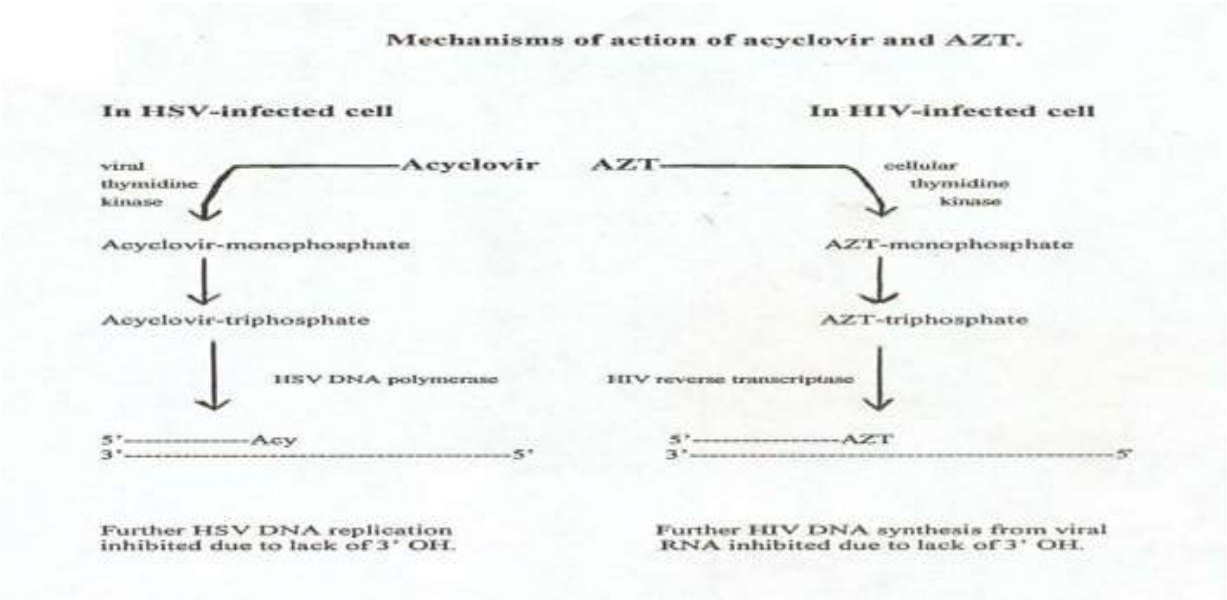


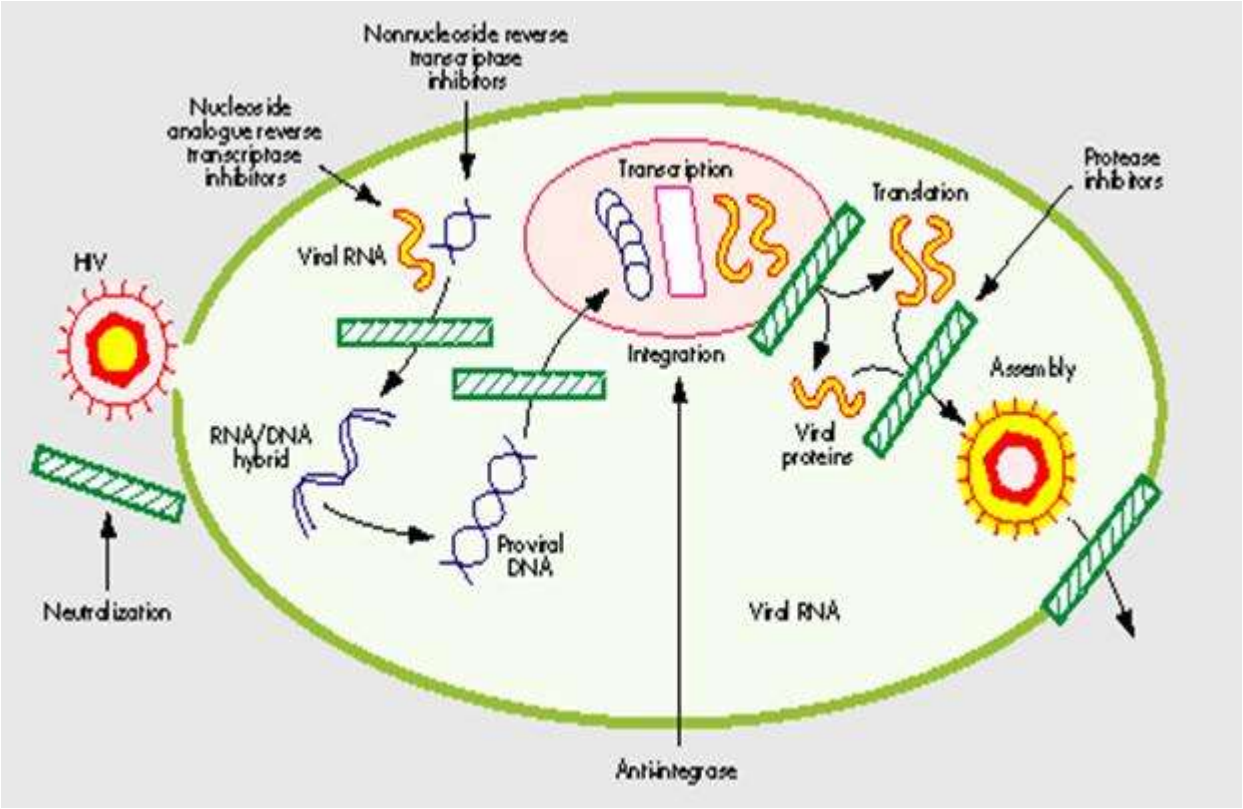





Tetracyclines
Chloramphenicol
Inactivation by chelation of Ca^{2+}, Al^{3+} etc.
Irritation of mucous membranes
Absorption
Antibacterial effect on gut flora
Chelation
Advantage: good penetration through barriers
Disadvantage: bone marrow toxicity


Entry
Eukaryotic host cell
Uncoating
Nucleic acid synthesis (viral enzyme directed)
Viral particle production
Exit
Viral uncoating
(effective against influenza A virus)
Amantadine
Rimantadine
Nucleic acid synthesis
(effective primarily against herpesviruses and HIV)
Nucleoside analogs
Nonnucleoside polymerase inhibitors
Nonnucleoside reverse transcriptase inhibitors
Assembly and release of viral particles
(effective against HIV)
Protease inhibitors
(effective against influenza viruses)
Neuraminidase inhibitors


Mechanisms of action of acyclovir and AZT.
In HSV-infected cell
In HIV-infected cell
viral thymidine kinase
Acyclovir
AZT
cellular thymidine kinase
Acyclovir-monophosphate
AZT-monophosphate
Acyclovir-triphosphate
AZT-triphosphate
HSV DNA polymerase
HIV reverse transcriptase
5'----------Acy
3'----------5'
5'----------AZT
3'----------5'
Further HSV DNA replication inhibited due to lack of 3' OH.
Further HIV DNA synthesis from viral RNA inhibited due to lack of 3' OH.



Supportive Care	
Airway protection	Treatment of seizures
Oxygenation/ventilation	Correction of temperature abnormalities
Treatment of arrhythmias	Correction of metabolic derangements
Hemodynamic support	Prevention of secondary complications
Prevention of Further Poison Absorption	
Gastrointestinal decontamination	Decontamination of other sites
Gastric lavage	Eye decontamination
Activated charcoal	Skin decontamination
Whole-bowel irrigation	Body cavity evacuation
Dilution	
Endoscopic/surgical removal	
Enhancement of Poison Elimination	
Multiple-dose activated charcoal administration	Extracorporeal removal
Alteration of urinary pH	Hemodialysis
Chelation	Hemoperfusion
	Hemofiltration
	Plasmapheresis
	Exchange transfusion
	Hyperbaric oxygenation
Administration of Antidotes	
Neutralization by antibodies	Metabolic antagonism
Neutralization by chemical binding	Physiologic antagonism
Prevention of Reexposure	
Adult education	Notification of regulatory agencies
Child-proofing	Psychiatric referral