

Ministry of Public Health of Ukraine
National O.O. Bogomolets Medical University
Zaporozhye Medical University
Pharmacology department

STUDY GUIDE
OF THE PRACTICAL CLASSES COURSE
“PHARMACOLOGY”

Modul II

MODUL II

CONTENTS

PRACTICAL WORK (P. W.)

P.W. 1	Antihypertensive drugs. Drugs acting on kidneys function	
P.W. 2	Cardiostimulants. Cardiac glycosides. Nonglycosides inotropic agents. Antiarrhythmic drugs	
P.W. 3	Agents normalizing coronary blood flow. Antianginal drugs. Drugs used in the treatment of hyperlipidemia	
P.W. 4	Drugs acting on respiratory system	
P.W. 5	Drugs affecting the gastrointestinal tract	
P.W. 6	Drugs acting on blood system	
P.W. 7	Antiseptics and disinfectants	
P.W. 8	Chemotherapeutic drugs. Antibiotics	
P.W. 9	Sulfonamides. Quinolones. Antifungal agents.	
P.W. 10	Antituberculous and antiviral drugs	
P.W. 11	Agents used for treatment of protozoal infections. Antihelmintic drugs	
P.W. 12	Antineoplastic Agents	
P.W. 13	Basic principles to the treatment of poisoning	
P.W. 14	Control lesson. Modul II	

P.W. 1.

Theme:

Antihypertensive drugs. Drugs acting on kidneys function

General questions:

1. Drugs used in the treatment of hypertension. Classification of antihypertensive drugs.
2. Classification, pharmacologic characteristics of adrenoreceptor blockers.
3. Pharmacology of Calcium channel blockers.
4. Drugs acting on renin-angiotensin system, classification, mechanism of action, pharmacokinetics, pharmacologic effects, therapeutic uses, adverse effects.
5. Centrally acting sympatholytic agents, pharmacokinetics, pharmacologic effects, therapeutic uses, adverse effects.
6. Myotropic vasodilators. Pharmacotherapy of hypertensive crisis.
7. Drugs affecting the kidney. Classification, pharmacologic characteristics, therapeutic uses in the treatment of hypertension.

Classification of antihypertensive drugs:

I. Agents affecting rennin-angiotensine system:

1. ACE inhibitors:

- Captoprilum (Capotenum)
- Enalaprilum (Renitec)
- Lisinoprilum

2. Angiotensine II antagonist:

Losartanum

II. Sympathoplegic drugs:

1. Central acting adrenergic drugs:

- Clophelinum
- Methyldopha

2. Central and peripheral acting

a. Sympatholytics:

- Reserpinum
- Octadinum

b. Ganglioblockers:

- Benzohexonium
- Pentaminum

c. β -blockers:

- Propranololum (Anaprilinum)
- Metoprololum
- Atenololum
- Bisoprololum

III. Peripheral vasodilators:

1. Direct vasodilators:
 - Magnesii sulfas
 - Apressinum
 - Natrii nitroprussidum
 - Dibazolum
 - Papaverini hydrochloridum
 - Drotaverini hydrochloridum (Nospanum)
 2. Calcium channel blockers:
 - Nifedipinum
 - Amlodipinum
 - Verapamilum
 3. α_1 – blockers:
 - Prazosinum
 - Doxazosinum
 4. Diuretics:
 - Hydrochlorthiazidum (Dichlothiazidum)
 - Furosemidum, Torasemidum
 - Acidum ethacrynicum
 - Spironolactonum
 - Triamterenum
 - Amiloridum
- Osmotic diuretics:
- Mannitolum
 - Urea pura

Home task on prescription:

1. Captoprilum in tablets.
2. Nifedipinum in capsules.
3. Metoprololum in ampoules.
4. Prazosinum in tablets.
5. Dibazolum in ampoules.
6. Lisinoprilum in tablets.
7. Magnesii sulfas in ampoules.

8. Spironolactonum in tablets.

Educational research work:

Assinment 1. Prescribe:

1. Clophelinum in tablets and ampoules.
2. Benzohexonium in ampoules.
3. Verapamilum in tablets.
4. Amlodipinum in tablets.
5. Papaverini hydrochloridum in ampoules.
6. Dibazolium in tablets.
7. Furosemidum in ampoules.
8. Dichlothiazidum in tablets.
9. Mannitum in flacons.
10. Triamterenum in capsules.

Assignment 2. Pharmaco-therapeutic task:

1. An antihypertensive agents – ACE-inhibitors.
2. A ganglioblocker in hypertensive crisis.
3. A peripheral vasodilators of direct action.
4. β -adrenoblockers used for treatment of hypertension.
5. Centrally acting sympatholytic agents.
6. Loop diuretics used for treatment of hypertension.
7. An antihypertensive drugs – Calcium channel blocking agents.

Assignment 3. Individual work.

Drugs	Dosage forms	Indication to use

Assignment 4.

Choose **one** correct answer:

1. A patient with hypertensive disease with an accompanying obstructive bronchitis receives propranolol in complex therapy. After a while attacks of asthma occurred. What is the cause of the side effect?
 - A. Blockade of β_2 -adrenoreceptors of bronchi.
 - B. Blockade of β_1 -adrenoreceptors of bronchi.
 - C. Stimulation β_2 -adrenoreceptors of bronchi.

- D. Blockade of α_2 -adrenoreceptors of bronchi.
- E. Stimulation of α_1 -adrenoreceptors of bronchi.

2. A patient suffers from hypertensive crisis. What is it necessary to prescribe to the patient for the normalization of arterial pressure?

- A. Propranololum.
- B. Reserpinum.
- C. Prazosinum.
- D. Atropini sulfas.
- E. Magnesii sulfas.

3. Increased renin level in the blood of a 55-year-old patient with hypertensive disease was detected. What hypotensive medicine should be preferred for the treatment of the patient?

- A. Magnesii sulfas.
- B. Clophelinum.
- C. Enalaprilum.
- D. Papaverini hydrochloridum.
- E. Prazosinum.

4. A patient with increased arterial pressure caused by peripheral vessels spasm is admitted to a therapeutics department. What hypotensive drug (the group of α -adrenoceptor antagonists) is the most expedient to be prescribed to the patient?

- A. Captoprilum.
- B. Prazosinum.
- C. Aminazinum.
- D. Propranololum.
- E. Clophelinum.

5. A patient with hypertensive disease has an attack of bronchial asthma. What medicine should be taken to stop the attack?

- A. Adrenalini hydrochloridum.
- B. Isadrinum.
- C. Salbutamololum.
- D. Aminophyllinum.
- E. Ephedrini hydrochloridum.

6. A doctor has prescribed losartan to a patient with essential hypertension. What pharmacological property of this drug provides therapeutic effect?
- A. Blockade of β -adrenoreceptors.
 - B. Blockade of α -adrenoreceptors.
 - C. Blockade of angiotensin receptors.
 - D. Blockade of angiotensin-converting enzyme.
 - E. Antagonism with calcium ions.
7. A patient with essential hypertension takes enalapril. What is the mechanism of the action of this drug?
- A. Blockade of angiotensin-converting enzyme.
 - B. Blockade with angiotensin receptors.
 - C. Blockade of phosphodiesterase.
 - D. Blockade of cyclooxygenase.
 - E. Blockade of calcium channels.
8. A doctor recommended a patient with chronic cardiac insufficiency and essential hypertension to include into the treatment regimen a potassium sparing diuretic, which is the antagonist of aldosterone, but its therapeutic effect develops slowly. Which of these drugs has been recommended to the patient?
- A. Strophanthinum.
 - B. Amiodaronum.
 - C. Triamterenum.
 - D. Furosemidum.
 - E. Spironolactonum.
9. One of antihypertensive drugs had been prescribed to a patient with arterial hypertension. Arterial pressure was normalized, however, constant dry cough began to bother the patient. Which of the medicines possesses such side effect?
- A. Nifedipinum.
 - B. Propranololum.
 - C. Clophelinum.
 - D. Enalaprilum.
 - E. Reserpinum.
10. The patient suffering from arterial hypertension with hyperkinetic type of circulation and the high contents of renin, accompanied by stenocardia

and sinus tachycardia has been treating for 10 years. Indicate the group of drugs should be administered in this situation.

- A. β -adrenoblockers.
- B. Organic nitrates.
- C. α -adrenoblockers.
- D. Sympatholytics.
- E. Ganglioblockers.

11. A 45 year old patient, who had been suffering from idiopathic hypertension, was treated by an antihypertensive drug. After 4 days his arterial pressure decreased, but he complained of sleepiness and psychological suppression. With which drug was the patient treated?

- A. Captoprilum.
- B. Prazozinum.
- C. Clophelinum.
- D. Enalaprilum.
- E. Apressinum.

12. A patient had been suffering from hypertonic disease accompanied by chronic bronchitis with asthmatical component. Indicate the drug which is contraindicated due to it's action on the bronchi.

- A. Anaprilinum.
- B. Captoprilum.
- C. Prazosinum.
- D. Nifedipinum.
- E. Dichlothiazidum.

13. A doctor has administered to a patient clonidine (clophelinum) for elimination of hypertensive crisis. What class of hypotensive drugs does the named agent belong to?

- A. Peripheral neurotropic.
- B. Central neurotropic.
- C. Diuretics.
- D. Drugs affecting the renin-angiotensin system.
- E. Myotropic (vasotropic) hypotensive agents.

14. Indicate the drug which inhibits activity of vasomotor centre.

- A. Apressinum.
- B. Enalaprilum.

- C. Verapamilum.
- D. Clophelinum (clonidinum).
- E. Hydrochlorthiazidum (dichlothiazidum).

15. Hypertensive crisis characterized by sharp headache, dizziness, hyperemia of face, pains in the region of heart, rapid pulse, arterial pressure of 220/110 mm Hg has developed in a patient suffering from essential hypertension during the visit to the dentist. What agent is it necessary to introduce to the patient?

- A. Propranololum (Anaprilinum).
- B. Pirilenum.
- C. Timololum.
- D. Furosemidum.
- E. Clophelinum (clonidinum).

16. It was observed primary short-term increase of arterial pressure in a patient after taking of a hypotensive agent. Indicate this preparation.

- A. Prazosinum.
- B. Reserpinum.
- C. Clophelinum (clonidinum).
- D. Propranololum (Anaprilinum).
- E. Hydrochlortniazidum (dichlothiazidum).

17. The diuretic agent in dosage 0,025 g 2 times a day had been prescribed to the patient with the beginning stage of idiopathic hypertension. In 7-8 days, the arterial pressure had slightly decreased, but he began to complain of pain in the heart region, muscle weakness, and tremor. The analysis of blood has revealed hypokalemia. Which from the listed drugs may cause this side effect.

- A. Mannitum.
- B. Spironolactonum.
- C. Triamterenum.
- D. Amiloridum.
- E. Hydrochlorthiazidum (dichlothiazidum).

18. A patient had taken celanidum for long time due to chronic heart failure. The physician administered to him dichlothiazidum to eliminate leg edemas. Which drug should be taken together with the diuretic to prevent hypokalemia?

- A. Unithiolum.
- B. Calcii chloridum.
- C. Pananginum.
- D. Calcii dobesilas.
- E. Magnii sulfas.

19. A patient has been treated for a long time with cardiac glycoside digoxinum in connection with congestive heart failure. Now the patient's state is stable, but there are remaining edemas on the legs and face. What diuretic should be taken to avoid side-effects caused by simultaneous administration of cardiac glycosides and diuretics?

- A. Diacarbium.
- B. Mannitum.
- C. Dichlothiazidum.
- D. Spironoiactonum.
- E. Urodanum.

20. Which of the following drugs is an ACE inhibitor:

- A. Nifedipinum.
- B. Euphyllinum.
- C. Diltiazemum.
- D. Amlodipinum.
- E. Captoprilum.

Assignment 5.

*Choose **all** correct answers:*

1. In the case of acute arterial pressure fall we use:

- 1. Mesatonum
- 2. Adrenalini hydrochloridum
- 3. Noradrenalini hydrotartras
- 4. Isadrinum
- 5. Salbutamolum

2. Antihypertensive drug Anaprilinum:

- 1. is a non-selective b-adrenoblocker
- 2. is effective in the case of coronary disease
- 3. Is a bronchial spasmolytic
- 4. causes a decrease in heart rate and in cardiac output

5. may cause a bronchospasm

3. In the case of blood hypertension such b1-adrenoblockers are used as:
 1. Anaprilinum
 2. Metoprololum
 3. Atenololum
 4. Isadrinum
 5. Prazosinum

4. Hypertensive drugs:
 1. a,b-adrenomimetics
 2. a-adrenomimetics
 3. sympatholytics
 4. sympathomimetic agents
 5. b2-adrenomimetics

5. Drugs used for hypertension treatment are:
 1. Doxazosinum
 2. Prazosinum
 3. Metoprololum
 4. Thiopentalum natrium
 5. Zolpidem

6. Side effects of prazosinum:
 1. orthostatic [postural] hypotension
 2. drowsiness
 3. heart pain
 4. tachycardia
 5. headache

7. Contraindications for administration of anaprilinum:
 1. hypotension
 2. stenocardia
 3. bradycardia
 4. bronchial asthma
 5. hypertension

8. In the case of hypertension these drugs are contraindicated:
 1. Clophelinum

2. Mesatonum
3. Ephedrinum
4. Extr. Eleutherococci fluidum
5. Nifedipine

9. In the case of hypertensive crisis these drugs are indicated:

1. Magnesii sulfas
2. Mesatonum
3. Calcii gluconas
4. Clophelinum
5. Adrenalini hydrochloridum

10. A patient suffering hypertension after prolonged treatment by antihypertensive drugs developed coughing. Which of these drugs could cause it:

1. Enalaprilum
2. Prazosinum
3. Lisinoprilum
4. Captoprilum
5. Verapamilum

11. A 60-year-old man was admitted into therapeutic department having an elevated level of renin in the blood. Which drug shall be used for treatment in this patient:

1. Clophelinum
2. Lisinoprilum
3. Anaprilinum
4. Enalaprilum
5. Prazosinum

12. What drug a patient shall be administered having high blood pressure caused by spasm of peripheric vessels?

1. Prazosinum
2. Anaprilinum
3. Clophelinum
4. Doxazosinum
5. Izadrinum

13. What drug can be used in the case of orthostatic collapse?

1. Benzohexonium

2. Dibazolium
3. Pentaminum
4. Drotaverinum
5. Captoprilum

14. Identify side effects of ACE inhibitors:

1. dry cough
2. orthostatic collapse
3. hypokalemia
4. agranulocytosis
5. thrombocytopenia

15. Calcium antagonists for treatment of hypertension:

1. Anaprilinum
2. Amlodipinum
3. Metoprololum
4. Verapamilum
5. Nifedipinum

16. Side effects of b-adrenoblockers:

1. bronchospasm
2. hyperglycinemia
3. withdrawal syndrome
4. hypokalemia
5. dryness of mucous tunics

17. Side effects of calcium antagonists:

1. vertigo
2. edema of lower extremities
3. redness of skin of the face
4. may cause a gout attack
5. headache

18. Diuretics which are used in the case of hypertension:

1. Furosemidum
2. Indapamide
3. Dichlothiazidum
4. Diltiazem
5. Metoprololum

19. Side effects of diuretics:

1. hypokalemia
2. hypomagnesemia
3. hyperuricemia
4. may cause a gout attack
5. withdrawal effect

20. Means for controlled hypotension:

1. Hygronium
2. Benzohexonium
3. Natrium nitroprussid
4. Drotaverinum
5. Pentaminum

P. W. 2.

Theme:

Cardiostimulants. Cardiac glycosides. Nonglycosides inotropic agents. Antiarrhythmic drugs.

General questions:

1. Classification and general characteristic of cardiotonic drugs.
2. Pharmacology of cardiac glycosides: history, classification, pharmacokinetics, comparative characteristic. Pharmacodynamics of cardiac glycosides. Mechanism of inotropic action, biochemical pharmacodynamics of cardiac glycosides.
3. Indications, contraindications, adverse effects of cardiac glycosides. Intoxication by cardiac glycosides, its manifestation, treatment and prophylaxis.
4. Pharmacological characteristics of nonglycosides cardiotonic agents.
5. Antiarrhythmic drugs. Classification, general characteristic. Pharmacology of membranostabilizing agents.
6. Pharmacokinetics and pharmacodynamics of 1A, 1B and 1C subgroups.
7. β -Adrenoblockers, K^+ and Ca^{2+} -channels blockers in the treatment of cardiac arrhythmias.
8. Agents used to treat bradyarrhythmias.

Classification of cardiotonic drugs.

I. Steroid cardiotonic drugs (cardiac glycosides);

1. Digitalis drugs.
 - 1.1. Digitalis purpurea drugs: Digitoxinum
 - 1.2. Digitalis lanata: Digoxinum, Celanidum, Medilasidum, Lantosidum.
2. Strophanthus drugs.
 - 2.1. Strophanthus Kombe: Strophanthinum K.
 - 2.2. Strophanthus gratus: Strophanthinum G.
3. Convallariae drugs: Corglyconum, Tinctura Convallariae.
4. Adonis vernalis drugs: Infusum herbae Adonidis vernalis, Adonisidum, Cardiophytum, Cardiotonum.
5. Erysimum drugs: Cardiovalenum.

II. Nonsteroid cardiotonic drugs: Dophaminum, Dobutaminum, Amrinonum, Milrinonum, Lavasimendanum.

Classification of drugs for treatment of arrhythmias.

I. Drugs for treatment of bradyarrhythmias:

1. M-cholinoblockers: Atropini sulfas, tinctura Belladonnae, extractum Belladonnae, guttae Zelenini.
2. Adrenomimetic drugs: Adrenalini hydrochloridum, Noradrenalini hydrotartars, Isadrinum, Orciprenalini sulfas;
3. Glucagonum (in some countries).

II. Drugs for treatment of tachyarrhythmias

1) Class I antiarrhythmic agents (Membranostabilizers)

Class IA: Chinidini sulfas, Novocainamidum, and Disopyramidum.

Class IB: Lidocainum, Dipheninum, Mexiletinum, Tocainidum, and Trimecainum.

Class 1C: Propaphenonum, Flecainidum, Aethacizinum, Aethmozinum, Aimalinum, Encainidum.

2) Class II antiarrhythmic agents: Propranololum, Metoprololum, Atenololum, Betaxololum, Acebutololum, Esmololum.

3) Class III antiarrhythmic agents: Amiodaronum Sotalolum.

4) Class IV antiarrhythmic agents: Verapamilum, Diltiazemum.

5) Others: cardiac glycosides, drugs of kalium, magnesium, metabolic and plunt drugs.

Home task on prescription:

1. Digitoxine in tablets and suppositories.
2. Strophanthine K in ampoules.
3. Infusion of herbae Adonidis vernalis.
4. Corglycone in ampoules.
5. Dophamine in ampoules.
6. Chinidini sulfas in tablets.
7. Novocainamide in ampoules.
8. Ajmaline in tablets.

Educational research work

Assignment 1. Prescribe:

1. Digoxine in ampoules and tablets.
2. Celanide in tablets.
3. Strophanthine G in ampoules.
4. Dobutamine in ampoules.
5. Unithiole in ampoules.
6. Novocainamidum in tablets.

7. Amiodarone in ampoules.
8. Panangine in dragee.

Assignment 2. *Pharmaco-therapeutic task:*

1. Drugs used for treatment acute heart failure.
2. Drugs used for treatment chronic heart failure.
3. Novogalenic Convallaria drug.
4. A cardiac glycoside to treat pulmonary edema.
5. An antidote in poisoning with cardiac glycoside – donor of sulfhydic groups.
6. Nonglycosides inotropic agents, which stimulate β_1 -adrenoreceptors.
7. Membranstabilizers from class IA to treat tachyarrhythmia.
8. M-cholinoblocker drugs for treatment of bradyarrhythmia.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4.

*Choose **one** correct answer:*

1. A patient with chronic cardiovascular insufficiency during digitalization demonstrated the following symptoms: headache, fatigue, nausea, color vision impairment (surrounding objects are perceived in green color). On ECG the sinus bradycardia and signs of impairment of atrioventricular conductivity were detected. What can be prescribed to relieve the symptoms of intoxication.

- A. Dipiroximum.
- B. Naloxonum.
- C. Bemegridum.
- D. Unithiolum.
- E. Atropini sulfas.

2. Ventricular arrhythmia followed myocardial infarction of a patient. Cardiac rhythm was normalized by the introduction of antiarrhythmic drug with local anesthesia effect. What drug was prescribed.

- A. Propranololum.
- B. Anaesthesinum.

- C. Verapamilum.
- D. Pananginum.
- E. Lidocainum.

3. A patient complains of edemas, rapid pulse, short breath, cyanosis of mucous tunics. The diagnosis is chronic cardiac insufficiency. What is it necessary to prescribe to the patient?

- A. Mesatonum.
- B. Papaverini hydrochloridum.
- C. Digoxinum.
- D. Cordiaminum.
- E. Nitroglycerinum.

4. A patient with signs of acute cardiac insufficiency is delivered to a hospital. Which drug is it necessary to prescribe urgently?

- A. Corglyconum.
- B. Aethimizolum.
- C. Dithylinum.
- D. Piridostigmini bromidum.
- E. Digitoxinum.

5. A patient with myocardial infarction and cardiac insufficiency has ventricular arrhythmia. What antiarrhythmic drug is a medicine of choice in this case?

- A. Novocainamidum.
- B. Chinidini sulfas.
- C. Nifedipinum.
- D. Lidocainum.
- E. Aimalinum.

6. Acute cardiovascular insufficiency is accompanied by edema of lungs. What medicine of cardiac glycoside group should be prescribed to the patient?

- A. Acetazolamidum (Diacarbum).
- B. Spironolactonum.
- C. Dichlothiazidum.
- D. Corglyconum.
- E. Triamterenum.

7. A patient with cardiogenic shock, hypotension, asthma, and edemas was prescribed a nonglycosidic cardiotonic. Which drug was injected to the patient?

- A. Coffeinum-natrii benzoas.
- B. Dobutaminum.
- C. Cordiaminum.
- D. Aethimizolum.
- E. Bemegridum.

8. A 68-year-old patient with cardiac insufficiency, who had been taking Digitalis medicines for a long time, had symptoms of intoxication, which were quickly eliminated by the application of the donator of the sulphhydic groups of unithiol. What is the mechanism of the therapeutic effect of this drug?

- A. Inhibition of potassium release from cardiac hystiocytes.
- B. Reduction of accumulation of ionized calcium.
- C. Reactivation of Na/K-ATP-ase of cardiac hystiocytes membranes.
- D. Slowing-down of sodium coming into cardiac hystiocytes.
- E. Increase of energy supply to the myocardium.

9. A cardiotonic drug was prescribed to a 50-year-old patient with chronic cardiac insufficiency and tachyarrhythmia. Which of these medicines was prescribed to the patient.

- A. Dobutaminum.
- B. Dophaminum.
- C. Digoxinum.
- D. Amiodaronum.
- E. Mildronatum.

10. A patient with complaints of frequent pulse, dyspnea, cyanosis of mucous tunics was hospitalized to a cardiological department. Examination revealed edemas on the lower extremities, ascites. Chronic cardiac insufficiency was diagnosed. Which of the drugs should be prescribed to the patient?

- A. Digitoxinum.
- B. Cordiaminum.
- C. Adrenalini hydrochloridum.
- D. Corglyconum.
- E. Drotaverini hydrochloridum.

11. A patient with pulmonary edema caused by acute left ventricular insufficiency patient was treated with cardiac glycoside. In 10-15 min, his condition improved and maximal effect was in 1-1,5 hours, after that the action gradually decreased. What drug has been injected?
- A. Strophanthinum.
 - B. Digoxinum.
 - C. Celanidum.
 - D. Digitoxinum.
 - E. Adonisidum.
12. Indicate the mechanism of antiarrhythmic action of Chinidini sulfas:
- A. Blockade of calcium channels of the cardiomyocyte membranes.
 - B. Blockade of sodium channels of the cardiomyocyte membranes.
 - C. Blockade of β -adrenoreceptors of the myocardium.
 - D. Blockade of α - and β -adrenoreceptors of the myocardium.
 - E. Blockade of M-cholinoreceptors of the myocardium.
13. Specify the mechanism of antiarrhythmical action of Verapamile:
- A. Blockade of sodium channels of the cardiomyocyte membranes.
 - B. Blockade of β -adrenoreceptors of the myocardium.
 - C. Blockade of α - and β -adrenoreceptors of the myocardium.
 - D. Blockade of calcium channels of the cardiomyocyte membranes.
 - E. Blockade of M-cholinoreceptors of the myocardium.
14. Specify the cardiac glycoside which possesses the fastest onset of the action:
- A. Strophanthinum.
 - B. Celanidum (lanatosidum).
 - C. Digitoxinum.
 - D. Digoxinum.
 - E. Adonisidum.
15. What effect of cardiac glycosides is of greatest importance?
- A. Increase of diuresis and elimination of edemas.
 - B. Increase of myocardium excitability.
 - C. Decrease of myocardium automatism.
 - D. Decrease of myocardium conductivity.
 - E. Increase of myocardium contractility.

16. Indicate the mechanism of cardiotoxic action of cardiac glycosides:
- A. Excitation of β -adrenoreceptors of myocardium.
 - B. Activation of calcium channels of cardiomyocyte membranes.
 - C. Inhibition of Na/K-ATP-ase of cardiac hystocytes membranes.
 - D. Oppression of phosphodiesterase of cardiomyocytes.
 - E. Activation of potassium channels of cardiomyocytes.
17. Indicate the group of drugs which is the most expedient for treatment of paroxysmal atrial tachycardia:
- A. M-cholinoblockers.
 - B. Cardiac glycosides.
 - C. Na-channels blockers.
 - D. β -adrenomimetics.
 - E. α -adrenoblockers.
18. Indicate the group of drugs, overdosage of which is accompanied by following signs: anorexia, nausea, vomiting, diarrhea, bradiarrhythmia, headache, vision impairment (xanthopsia, diplopia).
- A. Ca-channels blockers.
 - B. Organic nitrates.
 - C. Cardiac glycosides.
 - D. β -adrenoblockers.
 - E. Angiotensin converting enzyme inhibitors.
19. Why do strophanthin and corglycon possess fast action after the introduction into the organism?
- A. They have short half-life period.
 - B. They have high molecular weight.
 - C. They have low molecular weight.
 - D. They have high affinity to plasma proteins.
 - E. They are not connected with plasma proteins and not biotransformed in organism.
20. What antiarrhythmic preparation does not belong to membrane stabilizers?
- A. Dipheninum.
 - B. Amiodaronum.
 - C. Novocainamidum.

- D. Chinidini sulfas.
- E. Disopyramidum.

Assignment 5.

Choose all correct answers:

1. Choose plants from which glycosides come:

- 1. Foxglove
- 2. Strophanthus
- 3. Lily-of-the-valley
- 4. Deadly nightshade
- 5. Lychnis (Adonis vernalis)

2. Glycone of cardiac glycosides is responsible for:

- 1. the ability to cumulate
- 2. the degree of binding to plasma proteins
- 3. solubility
- 4. inotropic action
- 5. neurotropic action

3. Administration of cardiac glycosides produces such effects:

- 1. broncholytic action
- 2. inotropic
- 3. sedative
- 4. hypotensive
- 5. diuretic

4. In the case of cardiac glycoside poisoning it is indicated administration of:

- 1. lithium salts
- 2. potassium salts
- 3. Asparcam
- 4. Unithiolum
- 5. Calcium salts

5. Identify drugs which have inotropic action:

- 1. Digoxinum
- 2. Corglyconum
- 3. Strophanthinum

4. Dobutaminum
5. Anaprilinum

6. Which are major indications for administration of cardiac glycosides?
 1. chronic cardiac insufficiency
 2. acute cardiac insufficiency
 3. paroxysmal [recurrent] tachycardia
 4. bradycardia
 5. atrioventricular block

7. Which points of dobutaminum action are the most important?
 1. excitation of B1-adrenoreceptors
 2. positive inotropic action
 3. positive chronotropic action
 4. antianginal action
 5. hypolipidemic action

8. Choose membrane stabilizing antiarrhythmic agent:
 1. Chinidinum
 2. Novocainamidum
 3. Lidocaini hydrochloridum
 4. Propafenoni hydrochloridum
 5. Anaprilinum

9. Amiodaronum exerts following actions:
 1. antiarrhythmic
 2. antianginal
 3. hypnotic
 4. hypertensive
 5. broncholytic

10. Choose correct points relating to antiarrhythmic mechanism of action:
 1. Anaprilinum blocks B2 B1-adrenoreceptors
 2. Verapamilum blocks calcium canals
 3. Amiodaronum blocks potassium canals
 4. Anaprilinum is a selective B1-adrenoblocker
 5. Verapamilum blocks sodium canals.

11. Choose cardiac glycosides:

1. Strophanthinum
2. Corglyconum
3. Dobutaminum
4. Dophaminum
5. Digoxinum

12. Choose correct statements relating to strophanthinum:

1. it is an derivative of foxglove
2. it is used in the case of acute heart failure
3. it is used in the case of chronic cardiac insufficiency
4. it has short latent period
5. it is administered intravenously

13. Agylcone of cardiac glycosides has an influence on:

1. systolic pressure
2. diastolic pressure
3. accumulation
4. velocity of effect development
5. binding with plasma proteins

14. An increase of the force of myocardium contraction is due to:

1. blockade of the Na/K ATPase on the cardio hystiocyte membrane
2. an increase in intracellular ionized calcium
3. blockade of choline esterase
4. blockade of phosphodiesterase
5. activation of the Na/K ATPase

15. Cardiac glycosides exerts on the heart such actions as:

1. positive inotropic
2. negative inotropic
3. negative chronotropic
4. positive chronotropic
5. negative dromotropic

16. Nonglycoside inotropic agents are:

1. Dophaminum
2. Dobutaminum
3. Aethacizinum
4. Anaprilinum

5. Atropinum

17. Calcium antagonists are:

1. Verapamilum
2. Diltiazem
3. Amiodaronum
4. Anaprilinum
5. Metoprololum

18. Chinidini sulfas acts through:

1. blockade of Na and K transportation
2. stabilization of cardiac hystiocytes' membranes
3. blockade of calcium canals
4. blockade of B –adrenoreceptors
5. adenylate cyclase activation

19. Which antiarrhythmic drugs are indicated in the case of cardiac fibrillation and hypertension?

1. Chinidini sulfas
2. Novocainamidum
3. Anaprilinum
4. Metoprololum
5. Propafenoni hydrochloridum

20. In the care of bradyarrhythmia such drugs are indicated:

1. B–adrenomimetics
2. B–adrenoblockers
3. M-cholinoblockers
4. Calcium antagonists
5. Cardiac glycosides.

P. W. 3.

Theme:

Agents normalizing coronary blood flow. Antianginal drugs. Drugs used in the treatment of hyperlipidemia

General questions:

1. Classification of antianginal drugs (chemical structure and mechanism of action).
2. Pharmacokinetics and pharmacodynamics of organic nitrates, comparative characteristics, indications, contraindications, therapeutic uses, adverse effects.
3. Drugs decreasing the myocardial oxygen consumption. Pharmacology of β -adrenoblockers, use for treatment of angina pectoris.
4. Pharmacodynamics of Ca-channels blockers.
5. Drugs which increase stability of organism to hypoxia. Metabolic drugs.
6. The main principles of the myocardial infarction therapy.
7. Drugs used in the treatment of hyperlipidemia. Classification of hypolipidemic drugs. Mechanism of action, pharmacologic effects, therapeutic uses, adverse effects.
8. Pharmacology of angioprotectors.

Classification of antianginal drugs:

I. Organic nitrates:

- Nitroglycerinum
- Sustac-mite, Sustac-forte
- Nitrosorbidum
- Isosorbidi dinitras, Isosorbidi mononitras

II. β -Blockers:

- Propranololum
- Metoprololum
- Atenololum
- Bisoprololum

III. Ca-channel blockers:

- Verapamilum
- Nifedipinum
- Amlodipinum
- Diltiazemum

IV. Drugs of reflex action on coronar vessels:

- Validolum
- V. Drugs of different groups:**
- Molsidominum
 - Amiodaronum
 - Dipyridamolum

Classification of antihyperlipidemic drugs:

I. Hydroxy-methyl-glutaryl-Coenzyme A reductase (HMG-CoA reductase) inhibitors:

- Lovastatinum
- Simvastatinum
- Fluvastatinum
- Pravastatinum

II. Fibric acid derivatives:

- Fenofibratum
- Gemfibrozil
- Etofibratum
- Ciprofibratum

III. Group of nicotinic acid

- Nicotinic acid (Niacin)
- Nicotinamidum

IV. Bile acid sequestrants:

- Cholestyraminum
- Cholestipolum

V. Lipophilic antioxidant

- Probucolum

VI. Lipotropic drugs:

- Lipostabilum
- Lipoic acid
- Lipamidum
- Methionidum

Angioprotectors:

- Parmidinum
- Pentoxyphyllinum
- Calcii dobesilas
- Quercetinum
- Acidum acethylsalicylicum

Home task on prescription:

1. Nitroglycerinum in tablets.
2. Isosorbidi mononitras in ampoules.
3. Molsidominum in tablets.
4. Propranololum in ampoules.
5. Phenofibratum in capsules.
6. Simvastatinum in tablets.
7. Atenololum in tablets.
8. Calcii dobesilas in tablets.

Educational research work

Assignment 1.

Prescribe:

1. Nitroglycerinum in ampoules.
2. Sustac-forte in tablets.
3. Validolum in flacons and tablets.
4. Nitrosorbidum in tablets.
5. Metoprololum in ampoules and tablets.
6. Nifedipinum in tablets.
7. Riboxinum in tablets.
8. Lovastatinum in tablets.
9. Quercetinum in tablets.

Assignment 2.

Pharmaco-therapeutic task:

1. The most efficient drug to arrest angina pectoris attack.
2. Drugs for prophylaxis angina pectoris attack.
3. β -adrenoblockers for treatment angina pectoris.
4. Ca-channels blockers – antianginal drugs.
5. The drug with reflex type of action used for the arrest of angina pectoris attack.
6. Drugs for treatment myocardial infarction.
7. Antihyperlipidemic drugs - HMG-CoA reductase inhibitors.
8. Fibric acid derivatives for treatment hyperlipidemia.
9. The most effective angioprotectors in the affection of peripheral vessels.

Assignment 3.

Individual work.

Drugs	Dosage forms	Indication to use

Assignment 4.

Choose one correct answer:

1. A patient with angina pectoris developed bronchospasm after taking antianginal medicine. What drug could provoke it?

- A. Nifedipinum.
- B. Nitroglycerinum.
- C. Sustac-forte.
- D. Dipyridamolum.
- E. Propranololum.

2. A doctor recommended a patient, who had an acute myocardial infarction, to take acidum acetylsalicylicum in the dose of 0.25 g once per 2 - 3 days during 3 - 4 months. What effect did the doctor count on?

- A. Antiaggregant.
- B. Antiinflammatory.
- C. Antipyretic.
- D. Analgesic.
- E. Vasodilative.

3. A patient with ischemic disease has not informed the doctor that he had attacks of bronchospasm. The doctor prescribed a drug, which has made the attacks of angina pectoris less frequent, but the attacks of bronchospasm have become more frequent. What medicine has been prescribed?

- A. Atenololum.
- B. Propranololum.
- C. Verapamilum.
- D. Diltiazemum.
- E. Nitrosorbidum.

4. A 53-year-old woman suffers from heart attacks. The patient is bothered by severe chest pain, arrhythmia and short breath. What drug is the most expedient for prescription in this case to provide first aid?

- A. Nitrosorbidum.
- B. Nitroglycerinum.

- C. Amiodaronum.
- D. Propranololum.
- E. Sustac-forte.

5. Acidum acetylsalicylicum (75 mg, daily) is prescribed to a patient, who had a myocardial infarction. With what purpose is the drug prescribed?

- A. Reduction of body temperature.
- B. Reduction of inflammation.
- C. Reduction of pain.
- D. Dilatation of coronary vessels.
- E. Reduction of thrombocytes aggregation.

6. A 50-year-old man has appeal led to a doctor with complaints of chest pain, which occurs in the street, on his way to work, during physical activity. He has been ill for one year. The pain disappeared after taking validol, but recently its application has become inefficient. What drug should be prescribed?

- A. Natrii chloridum.
- B. Metoprololum.
- C. Octadinum.
- D. Clophelinum.
- E. Salbutamololum.

7. A 65-year-old patient felt retrosternal pain while waiting in a queue during the visit to a dermatologist. What drug is the most effective in this case?

- A. Cordiaminum.
- B. Validolum.
- C. Sustac-forte.
- D. Nitroglycerinum.
- E. Analginum.

8. A drug in the form of aerosol was prescribed to a patient with angina pectoris. The patient had retrosternal pain and used an antianginal drug. The pain disappeared, but the patient began to complain of headache and vertigo. What drug has been used by the patient?

- A. Nitroglycerinum.
- B. Propranololum.
- C. Metoprololum.

- D. Validolum.
- E. Verapamilum.

9. A patient who had been suffering from stable stenocardia was treated with anaprilin in the dosage of 0,02 g 3 times a day. In a week the patient had felt better, but began to complain of difficulty of respiration. Specify which drug from the group of beta-adrenoblockers should be appointed instead anaprilin.

- A. The antagonist of calcium – Verapamilum.
- B. Cardioselective beta-adrenoblocker – Metoprololum.
- C. Long acting drug of nitroglycerine – Sustac-forte.
- D. The antagonist of calcium – Nifedipinum.
- E. Organic nitrate – Nitroglycerinum.

10. Determine an antianginal agent by its pharmacological effect. It insignificantly improves coronary circulation (especially in subendocardial layers), but the main cause of elimination of stenocardia is dilation of peripheral veins and arteries, that leads to decrease of cardiac work and myocardial oxygen demand. Besides, it oppresses the central links of cardiostimulating reflexes.

- A. Amiodaronum.
- B. Phenihydinum.
- C. Nitroglycerinum.
- D. Validolum.
- E. Anaprilinum.

11. A patient who had been suffering from stenocardia accompanied by cardiac arrhythmia (paroxysmal tachycardia) and arterial hypertension was admitted to the hospital. Specify antianginal drug and the group which it belongs to, which should be administered taking into account the patient's diseases.

- A. β -adrenoblocker – Anaprilinum.
- B. Organic nitrate – Nitroglycerinum.
- C. Myotropic coronarodilating agent – Carbocromenum.
- D. Calcium antagonist – Nifedipinum.
- E. Potassium channel activator - Nicorandilum.

12. Indicate the nitroglycerin's drug with prolonged action

- A. Natrii nitroprussidum.

- B. Validolum.
- C. Amyl nitrite.
- D. Sustac-forte.
- E. Dipyridamolum.

13. Indicate the drug which exerts antianginal action because of decrease of oxygen demand and increase of oxygen delivery to the myocardium.

- A. Nitroglycerinum.
- B. Anapnlinum.
- C. Dipyridamolum.
- D. Talinololum.
- E Carbocromenum.

14. Indicate the state which requires administration of nitroglycerine.

- A. Chronic cardiac insufficiency.
- B. Acute cardiac failure.
- C. Hypertensive crisis.
- D. An attack of stenocardia.
- E. Endarteritis obliterans.

15. Indicate the drug which should be used in the attack of angina pectoris:

- A. Strophanthinum.
- B. Bemegridum.
- C. Nitrong
- D. Benzohexonium.
- E. Nitroglycerinum.

16. Indicate the mechanism of action of nitroglycerine.

- A. Release of NO groups which activate guanylyl cyclase.
- B. Blockade of calcium channels.
- C. Blockade of adenosine receptors.
- D. Activation of adenylyl cyclase.
- E. Inhibition of phosphodiesterase.

17. A patient with ischemic heart disease complaints of worsening of his state that is caused by overdosage of anti-anginal agent. What group of drugs can cause this state if it is known that concentration of methemoglobin in patients blood is increased?

- A. Beta-adrenoblockers.

- B. Organic nitrates.
- C. Blockers of calcium channels.
- D. Activators of potassium channels.
- E. Myotropic coronary dilators.

18. After sublingual introduction of nitroglycerine its maximal concentration in blood is developed in:

- A. 1 minute.
- B. 15 minutes.
- C. 2-5 minutes.
- D. 30 minutes.
- E. 1 hour.

19. Why are the tablets of nitroglycerine introduced sublingually only?

- A. The substance is destroyed under the action of gastric juice.
- B. The substance is badly absorbed in the gastrointestinal tract.
- C. The substance operates reflexly from oral cavity receptors.
- D. The substance is being considerably destroyed during its first passage through the liver.
- E. It causes less side-effect in such way of introduction.

20. Indicate the calcium channel blocker which belongs to the group of derivatives of phenylalkylamines:

- A. Nifedipinum.
- B. Diltiazemum.
- C. Nicardipinum.
- D. Clentiazemum.
- E. Verapamilum.

21. Among special hypolipidemic agents the most effective ones are those which block synthesis of endogenous cholesterol in the liver. What drug from listed below has such mechanism of action?

- A. Probucolum.
- B. Clofibratum.
- C. Cholestyraminum.
- D. Parmidinum.
- E. Lovastatinum.

22. A patient has the family hypercholesterolemia. Indicate the drug which may be used due to ability to inhibit the main enzyme of cholesterol synthesis?

- A. Lovastatinum.
- B. Colestipolum.
- C. Cholestyraminum.
- D. Nicotinic acid.
- E. Probucolum.

23. Indicate the hypolipidemic agent which may be used in atherosclerosis of brain arteries

- A. Cinnarizinum.
- B. Lovastatinum.
- C. Pyracetamum.
- D. Tocopheroli acetat.
- E. Ascorbinic acid.

24. Clofibrate was administered to a patient with atherosclerosis. What is the most typical effect of this drug?

- A. Oppression of 3-hydroxy-3-methylglutaryl-coenzyme A-reductase activity.
- B. Increase of removal from the organism of the bile acids and cholesterol.
- C. Diminution of very low density apoproteins maintenance in blood mainly.
- D. Antioxidant action.
- E. Angio-protective action.

25. Specify the principle of antihyperlipidemic action of lovastatine.

- A. Inhibition of synthesis of endogenous cholesterol in the liver.
- B. Impairment of creation of superoxide radicals.
- C. Impairment of absorption of cholesterol in the intestine.
- D. Impairment of lipolysis in the fatty tissue.
- E. Impairment of binding of atherogenous lipoproteins with endotheliocytes.

Assignment 5.

Choose all correct answers:

1. Side effects of Nitroglycerinum:

1. orthostatic hypotension
2. headache
3. hyperemia of face
4. bronchospasm
5. bradycardia

2. In the case of stenocardia selective adrenoblockers are used:

1. mesatonum
2. metoprololum
3. atenololum
4. prazosinum
5. izadrinum

3. Contraindications for administration of anaprilinum:

1. hypotension
2. stenocardia
3. bradycardia
4. bronchial asthma

4. Side effects of calcium antagonists:

1. shin swelling
2. dizziness
3. gout attacks
4. skin redness
5. bradycardia

5. Contraindications for administration of nitroglycerinum:

1. glaucoma
2. acute infarction
3. craniocerebral trauma
4. arterial hypertension
5. gastric ulcer

6. Medicines for treatment of an ongoing attack of angina:

1. mesatonum
2. prazosinum
3. validolum
4. nitroglycerinum
5. reserpinum

7. In the case of coronary disease these calcium blockers are used:

1. verapamilum
2. clopamidum
3. doxazosin
4. amlodipine
5. nifedipine

8. To prevent attacks of angina these drugs are used:

1. sustac
2. verapamilum
3. isosorbide mononitrate
4. isadrinum
5. prazosinum

9. An antianginal drug anaprilinum:

1. is a non-selective b-adrenoblocker
2. is affective in hypertension
3. is a bronchial spasmolytic
4. may cause bronchospasm
5. decreases heart rate

10. Side effects of b-adrenoblockers:

1. hyperglyceridemia
2. bronchospasm
3. withdrawal syndrome
4. dryness of mucous membranes
5. hypokalemia

11. Antianginal drugs that cause bradycardia and decrease blood pressure:

1. mesatonum
2. prazosinum
3. anaprilinum
4. metoprololum
5. atenololum

12. Which nitrates are used to prevent attacks of angina:

1. nitroglycerinum
2. sustac

3. isosorbide mononitrate
4. trinitrolong
5. diltiazem

13. Isosorbidi mononitras:

1. is a nitrate with long duration of action
2. has 100% bioavailability
3. is used to prevent attacks of angina
4. is combined with b-adrenoblockers
5. causes bronchospasm

14. Calcium blocker verapamilum:

1. has an antianginal activity
2. decreases spontaneous diastolic depolarization of myocardium
3. increases tolerance to physical activity
4. is contraindicated in the case of bronchial asthma
5. causes gastric ulcer

15. Anabolic drugs used to increase protein synthesis in myocardium:

1. retabolilum
2. riboxinum
3. kalii orotas
4. atenololum
5. asparcam

16. Patients with acute myocardial infarction are prescribed:

1. narcotic analgesic
2. nitroglycerinum intravenously
3. antiarrhythmic drugs
4. anticoagulating agents
5. antidepressants

17. In the case of stenocardia anticoagulants are used:

1. acidum acetylsalicylicum
2. clopidogrel
3. digoxinum
4. actilise
5. atropinum

18. In the case of stenocardia are used antioxidants:

1. tocopheroli acetas
2. acidum ascorbinicum
3. atenololum
4. magnesi sulfas
5. kalii chloridum

19. Drugs of myopic action used to decrease coronary vasoconstriction:

1. pentoxyphyllinum
2. no-spa
3. metoprololum
4. validolum
5. asparcam

20. Mechanism of action of potassium in stenocardia:

1. decreases permeability of membranes for calcium
2. slows down efflux of calcium from endoplasmic reticulum
3. prevents atherosclerosis
4. decreases platelet aggregation
5. causes bradycardia

P. W. 4.

Theme:

Drugs acting on respiratory system.

General questions:

1. Classification of drugs acting on respiratory system.
2. Respiratory stimulants: classification, comparative characteristics, therapeutic use, adverse effects.
3. Drugs used to treat cough. Antitussives: classification, therapeutic use, adverse effects.
4. Expectorans: classification, pharmacodynamics, therapeutic use, adverse effects.
5. Drugs used for treatment bronchial asthma: bronchodilators. Classification, pharmacodynamics, therapeutic use, adverse effects.
6. Drugs used in pulmonary edema.

Classification of drugs acting on respiratory system.

I. Respiratory stimulants

1. Drugs which mainly influence cortex: Coffeinum-natrii benzoas;
2. Drugs which mainly influence medulla oblongata: Aethimizolum, Camphora, Sulfocamphocainum, Cordiaminum, Bemegridum.
3. Drugs which mainly influence spinal cord : Strychnini nitras.

They are also divided into:

1. Drugs of direct action on respiratory centre: Coffeini natrii benzoas, Aethimizolum, Bemegridum.
2. Drugs of reflexive action: Lobelini Hydrochloride, Cytitonum, solutio Ammonii caustici.
3. Drugs of mixed action: Carbogenum (95-93 % O₂, 5-7 % CO₂), Cordiaminum, Camphora, Sulfocamphocainum.

II. Antitussives

1. Drugs of central action:
 - a) Opioides: Codeini phosphas, Aethylmorphini hydrochloridum.
 - b) Nonopioides drugs: Glaucini hydrochloridum, Oxeladini cytras, Synecodum.
2. Drugs of peripheral action: Libexinum, Falimint.

III. Expectorants

1. Bronchosecretor drugs:

- a) Drugs of reflector action: Infusum herbae Thermopsidis, Decoctum radices Althaeae, Mucalatinum.
- b) Resorbitive action: Kalii iodidum, Natrii hydrocarbonas

2. Mucolytics:

- a) proteolytic enzymes: Trypsini crystallisatum, Chymotrypsini crystallisatum, Desoxyribonucleasa, Ribonucleasa.
 - b) Synthetic mucolytics: Acetylcysteinum, Carbocysteinum.
 - c) Synthetic mucolytics that increase synthesis of surfactant: Bromhexinum, Ambroxolum.
 - d) Drugs of surfactant which change surfactant content in alveoli: Alveofact, Exosurf.
3. There are mixed expectorants.

IV. Bronchodilators

1. Adrenergic agents:

- a) beta₂-adrenomimetics: Salbutamolum, Fenoterolum.
- b) beta_{1,2}-adrenomimetics: Isadrinum, Orciprenalini sulfas.

2. M-cholinoblockers: Ipratropii bromidum, Atropini sulfas, Platyphyllini hydrotartras, Methacinum .

3. Myotropic broncholytics (Xantines): Euphyllinum, Theophyllum

4. Nonsteroid inflammatory drugs: Cromolyn–sodium, Nedochromylum–natrium, Ketotiphenum

5. Corticosteroids: Prednisolonum, Dexamethasonum, Triamcinolonum.

V. Drugs used to control pulmonary edema

I. Drugs decreasing hydrostatic pressure in lung vessels.

- 1. Natrii nitroprussidum and organic nitrates: Nitroglycerinum, Isosorbidi dinitras).
- 2. Ganglioblockers: Pentaminum, Benzohexonium, Hygronium.
- 3. Broncholytics: Euphyllinum.
- 4. Drugs with alpha – blocking properties: Aminazinum, Diprazinum.
- 5. Tranquilisers: Diazepamum.
- 6. Opioid analgetics: Morphini hydrochloridum.

7. Narcotic analgetics with neuroleptics: Phentanylum + Droperidolum or haloperidolum.

8. Corticosteroids: Prednisolonum.

II. Drugs improving heart contractility.

1. Cardiac glycosides: Corglyconum, Digoxinum, Strophanthinum.

2. Nonglycosides cardiotonics: Dophaminum, Dobutaminum.

III. Drugs decreasing circulating blood volume.

1. Loop diuretics: Furosemidum.

2. Osmotic diuretics in the conditions of tolerancy to furosemidum: mannitolum, Mannitum, Urea pura.

IV. Drugs restoring normal bronchial and bronchiols passage transforming gas into alveols in liquid (alcohol).

Home task on prescription:

1. Cordiamine in ampoules.
2. Libexine in tablets.
3. Acetylcysteine in ampoules.
4. Ipratropii bromide (Atrovent) for inhalation.
5. Euphylline in ampoules.
6. Mucaltine in tablets.

Educational research work

Assignment 1. Prescribe:

1. Aethimizole in ampoules.
2. Oxeladine citras in tablets.
3. Trypsine crystallisate for inhalation.
4. Mixture of infusion of herba Thermopsidis, Codeine phosphas, Natrii hydrocarbonas and syrupus Simplex for taking orally on 1 tablespoonful 3 times a day.
5. Ambroxole in tablets.
6. Acetylcysteine in tablets.
7. Fenoterole for inhalation.

Assignment 2. Pharmaco-therapeutic task:

1. A respiratory stimulants with direct type of action on respiratory center.
2. A respiratory stimulants with reflexive type of action.
3. Antitussive drug from opioide analgesics.
4. An expectorant – mucolytic - proteolytic enzyme.

5. A broncholytic, β -adrenomimetic to arrest bronchial asthma attack.
6. Ganglioblocker used for treatment pulmonary edema.
7. Drug decreasing circulating blood volume – loop diuretic.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4.

*Choose **one** correct answer:*

1. Indicate the mechanism of broncholytic action of Ipratropii bromidum:
 - A. Myotropic influence.
 - B. Blockade of M-cholinoceptors.
 - C. Stimulation of β -receptors.
 - D. Inhibition of phosphodiesterase.
 - E. Activation of adenilatcyclase.

2. Indicate the mechanism of bronchodilator – Salbutamol action:
 - A. Stimulation of β_2 -receptors.
 - B. Stimulation of α -receptors.
 - C. Inhibition of β_2 -receptors.
 - D. Inhibition of phosphodiesterase.
 - E. Blockade of adenosine receptors.

3. Indicate the stimulant of respiration with sedative effect and anti-inflammatory properties:
 - A. Bemegridum.
 - B. Aethimizolum.
 - C. Coffeinum-natrii benzoas.
 - D. Cordiaminum.
 - E. Lobelini hydrochloridum.

4. Indicate the antitussive agent with central non-narcotic type of action:
 - A. Codeini phosphas.
 - B. Aethylmorphini hydrochloridum.
 - C. Libexinum.
 - D. Oxeladini citras.

E. Bromhexinum.

5. Indicate the antitussive agent of peripheral action:

A. Codeini phosphas.

B. Aethylmorphini hydrochloridum.

C. Libexinum.

D. Glaucini hydrochloridum.

E. Bromhexinum.

6. A child was born with asphyxia. What agent is it necessary to introduce for stimulation of breath?

A. Lidocainum.

B. Lobelini hydrochloridum.

C. Prazosinum.

D. Atropini sulfas.

E. Proserinum.

7. To specify an analeptic which possesses sedative activity and can be used as desensibilizing agent in bronchial asthma:

A. Carbogenum.

B. Camphora.

C. Cordiaminum.

D. Aethimizolum.

E. Dimedrolum.

8. Indicate antitussive agent possessing properties of opioid analgesics:

A. Codeini phosphas.

B. Libexinum.

C. Tussuprex.

D. Glaucinum.

E. Falimint.

9. Indicate the drug oppressing a peripheral link of cough reflex:

A. Atropini sulfas.

B. Codeini phosphas.

C. Ethylmorphini hydrochloridum.

D. Bromhexinum.

E. Libexinum.

10. The mechanism of expectorant action of Thermopsis herb infusion is:
A. Irritates bronchial glands during excretion that leads to stimulation of their secretion.
B. Directly stimulates peristalsis of bronchial smooth muscles.
C. It destroys proteins of sputum.
D. It stimulates bronchial secretion reflexively irritating the stomach receptors.
E. It inhibits the cough center.

11. Indicate an expectorant agent possessing the reflex type of action:
A. Bromhexinum.
B. Infusum herbae Thermopsidis.
C. Acetylcysteinum.
D. Trypsinum.
E. Kalii iodidum.

12. Mark the group of drugs used for elimination of bronchial asthma attacks.
A. M-cholinomimetics.
B. N-cholinomimetics.
C. Sympatholytics.
D. Beta-adrenoblockers.
E. Beta-adrenomimetics.

13. Indicate the mechanism of broncholytic effect of adrenaline:
A. Blockade of β -2-adrenoreceptors.
B. Stimulation of β -1-adrenoreceptors.
C. Stimulation β -2-adrenoreceptors.
D. Stimulation of α -1 and α -2-adrenoreceptors.
E. Blockade of N-cholinoreceptors.

14. Activation of what receptor formations should be produced at the patient with bronchial asthma to eliminate bronchospasm?
A. α -adrenoreceptors
B. α -adrenoreceptors and β -adrenoreceptors
C. M-cholinoreceptors
D. N-cholinoreceptors
E. β -adrenoreceptors

15. What from the listed below effects of diuretics explains their effectiveness in the case of pulmonary edema?

- A. Reduce the blood pressure in the systemic circulation.
- B. Reduce the excitability of respiratory center.
- C. Increase osmotic pressure of the blood.
- D. Cause the blood redistribution in the organism.
- E. Improve systemic hemodynamix.

16. Indicate the diuretic agent which should be used to treat pulmonary edema:

- A. Spironolactonum.
- B. Hydrochlorthiazidum (dichlothiazidum).
- C. Triamterenum.
- D. Furosemidum.
- E. Acetazolamidum (diacarbum).

17. Benzohexonium was introduced to a patient with pulmonary edema caused by systemic arterial hypertension. Indicate the mechanism of action of this agent?

- A. Activation of α -adrenoreceptors of vessels.
- B. Blockade of dopamine receptors in the CNS.
- C. Stimulation of M-cholinoreceptors.
- D. Activation of adrenoreceptors of vasomotor center.
- E. Blockade of N-cholinoreceptors of vegetative ganglions.

18. A patient with bronchial asthma attack has a concomitant disease – angina pectoris. What bronchodilator is to be prescribed in this case?

- A. Salbutamolum.
- B. Adrenalini hydrochloridum.
- C. Isadrinum.
- D. Aminophyllum.
- E. Atropini sulfas.

19. A 42-year-old patient has bronchial asthma. To relieve the attacks of bronchospasm a doctor has prescribed salbutamol. What is its medical effect?

- A. Stimulation of β_1 -adrenoreceptors
- B. Stimulation of β_2 -adrenoreceptors
- C. Stimulation of α_2 -adrenoreceptors

D. Blockade of α_1 -adrenoreceptors

E. Blockade of β_1 -adrenoreceptors

20. Indicate the drug which is used as prophylactic agent of bronchial asthma attacks:

A. Adrenalini hydrochloridum.

B. Euphyllinum.

C. Cromolinum-sodium.

D. Aethimizolum.

E. Bromhexinum.

Assignment 5.

Choose all correct answers:

1. In the case of bronchial asthma these drugs are prescribed:

1. M-cholinoblockers
2. M-cholinomimetics
3. b-adrenoblockers
4. inhibitors of phosphodiesterase
5. β -adrenoblockers

2. In the case of pulmonary edema are prescribed:

1. Strophanthinum
2. spirit by oral administration
3. spirit in inhalation
4. Furosemidum
5. Procainum

3. Thermopsis acts due to:

1. irritation of receptors in stomach mucosa
2. reflex from bronchia's receptors
3. direct action on the vomiting center
4. stimulation on the choline receptors
5. stimulation of the ciliated epithelium

4. These are mucolytic agents of direct action:

1. Acetylcysteinum
2. sodium bicarbonate
3. Chymotrypsinum

4. salt-cake
5. Zafirlukast

5. In the case of bronchial asthma are used:

1. M-cholinoblockers
2. N-cholinoblockers
3. b-2-adrenomimetics
4. b-1 a-1-adrenomimetics
5. myotropic broncholytic

6. Choose mucolytics:

1. Bromhexinum
2. Solutio Ammonii caustici
3. Natrii bicarbonas
4. Trypsinum
5. Glaucini hydrochloridum

7. Which drugs are used for treatment of bronchial asthma?

1. glucocorticoids
2. M-cholinoblockers
3. b-adrenomimetics
4. membrane stabilizers of mast cells
5. respiratory stimulants

8. Respiratory stimulants of reflective action:

1. Cytitonum
2. Lobelinum
3. Bemegridum
4. Coffeinum
5. Libexinum

9. Which drugs suppress cough center?

1. Codeinum
2. Tiotropium bromide
3. Glaucini hydrochloridum
4. Tusuprex
5. Atropinum

10. Expectorant drugs of reflective action are:

1. drugs of ipecacuanha
2. drugs of thermopsis
3. drugs of foxglove (Digitalis)
4. potassium iodide
5. Mucaltinum

11. Bronchodilators are:

1. Physostigminum
2. Ipratropium bromide
3. Theophyllinum
4. Infusum herbae Thermopsis
5. Salbutamolum

12. Choose direct synergists which are used in the case of bronchial asthma:

1. Verapamilum- Terbutalin
2. Euphyllinum- Theophyllinum
3. Ipratropium bromide- Methacinum
4. Prednisolonum- Triamcinolonum
5. Salbutamolum-phenoterolum

13. Bromhexinum:

1. increases synthesis of surfactant
2. is used in the case of bronchitis
3. its action is reflective
4. melts mucus
5. prevents synthesis of glycoproteins

14. Codeinum:

1. causes addiction
2. act on peripheral link of cough reflex
3. causes constipations when used for long time
4. dilates bronchi

15. In the case of bronchial asthma can be prescribed:

1. Salbutamolum
2. Physostigminum
3. Ipratropium bromide
4. Euphyllinum

5. Prednisolonum

16. Libexin is characterized by:

1. antitussive [cough-depressant] action
2. local anaesthetic activity
3. spasmolytic activity
4. vomiting action
5. antianginal action

17. Ipratropium bromide dilates bronchi because of:

1. blockade of b-2-adrenoreceptors
2. blockade of a-1-adrenoreceptors
3. stimulation of adenylate cyclase
4. excitation of b-2-adrenoreceptors
5. blockade of M-cholinergic receptors

18. Ipratropium bromide poorly penetrates blood-brain barrier because of:

1. existence of quaternary nitrogen atom
2. existence of tertiary nitrogen atom
3. lipophilic properties
4. lipophobic properties
5. big molecular weight

19. Choose drugs that stimulate b-2-adrenoreceptors:

1. Salbutamol
2. Salmeterol
3. Terbutalin
4. Fenoterol
5. Traventol

20. Choose drugs blocking M-cholinergic receptors:

1. Ipratropium bromide
2. Tiotropium bromide
3. Physostigmine salicylate
4. Proserin
5. Lobelinum

P. W. 5.

Theme:

Drugs affecting the gastrointestinal tract.

General questions:

1. Classification of drugs, which influence the appetite, drugs stimulating appetite and anorexigenic drugs.
2. Drugs increasing gastrointestinal motility: classification, pharmacologic characteristics. Cathartics: oils, anthraquinone derivatives, osmotic cathartics.
3. Drugs decreasing gastrointestinal motility, classification, pharmacologic characteristics.
4. Emetic and antiemetic drugs. Classification, mechanism of action, therapeutic use. Antidiarrheal agents.
5. Drugs acting on gastric secretion: classification, pharmacological characteristics of drugs increasing gastric secretion.
6. Pharmacology of H₂-receptor antagonist, H⁺, K⁺-ATP-ase inhibitors, antacids.
7. Gastroprotectors: classification, mechanism of action, therapeutic use.
8. Cholagogic drugs: classification, mechanism of action, clinical use. Hepatoprotectors.
9. Drugs used in pancreatic secretion disorders.

Classification of drugs acting on gastrointestinal disorders:

I. Drugs affecting the appetite:

1. Drugs affecting the appetite:

- Tinctura Absinthii
 - Plantaglicidum
 - Insulinum
 - Anabolic steroids (Retabolilum)
 - Vitamins
- ###### 2. Anorexic drugs:
- Phepranonum
 - Disopimonomum
 - Phenfluraminum

II. Drugs increasing gastrointestinal motility:

1. M-cholinomimetics:

- Aceclidinum

2. Anticholinesterase drugs:

- Proserinum
- Pyridostigmini bromidum

3. Prokinetics:

- Metoclopramidum (Cerucalum)
- Cisapridum (Propalsiol)
- Tegaserodum (Zelnorm)

4. Cathartics:

- Oleum Ricini
- Senadexinum (Senade)
- Cafiolum
- Isapheninum
- Bisacodylum
- Magnesii sulfas
- Natrii sulfas

III. Drugs decreasing gastrointestinal motility:

1. M-cholinoblockers:

- Atropini sulfas
- Platyphyllini hydrotartras
- Methacinum

2. Spasmolytics:

- Papaverini hydrochloridum
- Drotaverini hydrochloridum (Nospanum)

3. Drugs for treating diarrhea:

- Loperamidum
- Domperidonum
- Enterosgelum
- Smecta
- Lactobacterinum
- Enterolum
- Hylack
- Linex
- Lactobacterinum

IV. Emetic drugs:

- Apomorphini hydrochloridum
- Sol. Ammonii caustici

V. Antiemetics:

- Diprazinum (Pipolfenum)

- Metoclopramidum (Cerucalium)
- Domperidonum (Motilium)
- Scopolamini hydrobromidum (Aeronum)
- Ondansetronum (Zofranum)

VI. Drugs acting on gastric secretion:

1. Drugs increasing gastric secretion:

- Pentagastrinum
- Acidum hydrochloricum dilutum
- Pepsinum
- Succus gastricus naturalis

2. Drugs decreasing gastric secretion:

a) *Nonselective M-cholinoblockers:*

- Atropini sulfas
- Platyphyllini hydrotartras
- Methacinum

b) *Selective M-cholinoblockers:*

- Pirenzepinum (Gastrocepinum)

c) *H₂-histamine receptor antagonists:*

- Ranitidinum (Zantac)
- Famotidinum (Quamatelum)
- Nizatidinum (Axid)

d) *Proton pump inhibitors:*

- Omeprazolum (Losec, Omez)
- Lansoprazolum (Lancerol)
- Pantoprazolum (Controlock)

e) *Antacids:*

- Magnesii oxydum
- Natrii hydrocarbonas
- Almagel
- Maalox
- Rennie

VI. Gastroprotectors:

- Misoprostolum
- Carbenoxolum
- Enprostolum
- Bismuth tricalcii dicitras (De-Nol)
- Vicalinum
- Vicairum

VII. Choleric drugs:

- Cholenzymum
- Allocholum
- Oxaphenamidum
- Cholosasum
- Febicholum
- Sorbitolum
- Chenofalk

VIII. Hepatoprotectors:

- Essenciale
- Silimarinum
- Hepabene
- Thiotriazolinum
- Antralum
- Acidum lipoicum

IX. Drugs used in pancreatic secretion disorders:

- Pancreatinum
- Festalum
- Pansinorm
- Contrycalum

Home task on prescription:

1. Succus gastrici naturalis in flacons.
2. Xenicale in capsules.
3. Atropine sulfas in ampoules.
4. Pancreatine in tablets.
5. Magnesii oxide in undivided powders.
6. Apomorphine hydrochloride in ampoules.
7. De-nole in capsules.
8. Bisacodyle in rectal suppositories.
9. Pirenzepine in tablets.
10. Metoclopramide in ampoules.

Educational research work

Assignment 1. Prescribe:

1. Tinctura Absinthii.
2. Contricae.
3. Pentagastrinum in ampoules.

4. Ranitidine in tablets.
5. Omeprazole in capsules.
6. Maalox in flacons.
7. Allochole in tablets.
8. Bisacodyle in dragee.
9. Essentiale-forte in ampoules.
10. Aethaperazinum in tablets.

Assignment 2. *Pharmaco-therapeutic task:*

1. An anorexigenic agent to treat obesity.
2. Antacid drugs.
3. A drug, which is used for postoperative atony of intestine.
4. M₁-cholinoblocker selectively acting upon the stomach.
5. An H₂-antagonist to treat hypersecretory condition.
6. Antiemetic agent to treat unendurable nausea and vomiting.
7. A drug, which is used in the insufficiency of pancreatic exocrinous function.
8. An agent in hypersecretory function of pancreas.
9. Choleric drugs consist of bile acids.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4.

*Choose **one** correct answer:*

1. Famotidine is prescribed to a patient with gastric ulcer. The acidity of gastric juice has considerably decreased. What mechanism underlies the action of the drug?
 - A. Blockade of M-cholinoreceptors.
 - B. Blockade of H₁-histaminic receptors.
 - C. Blockade of H₂-histaminic receptors.
 - D. Suppression of the activity of Na⁺/ K⁺-ATP-ase.
 - E. Blockade of N-cholinoreceptors in ganglions.

2. A 40-year-old patient suffers from gastric ulcer at the stage of exacerbation accompanied by a substantial increase of the acidity of gastric juice, pain, and dyspeptic syndrome. Choose a corresponding drug:
- A. Allocholum.
 - B. Famotidinum.
 - C. Papaverini hydrochloridum.
 - D. Drotaverini hydrochloridum.
 - E. Platyphyllini hydrotartras.
3. A patient complains of stomachache, heartburn. Tests revealed the increase of gastric juice acidity. What should be prescribed to the patient for the neutralization of the excessive acidity of gastric juice?
- A. Benzohexonium.
 - B. Atropini sulfas.
 - C. Papaverini hydrochloridum.
 - D. Proserinum.
 - E. Almagelum.
4. A patient with biliary dyskinesia and constipations has been prescribed a cholagogue, which has a significant laxative effect. What drug was prescribed by the doctor?
- A. Allocholum.
 - B. Magnesii sulfas.
 - C. Cholosasum.
 - D. Cholenzymum.
 - E. Chinidini sulfas.
5. The patient was admitted to the hospital with the diagnosis: peptic ulcer of the duodenum bulbus. Analysis of his gastric juice revealed increased acidity. Choose the agent which decreases the secretory ability of gastric glands due to blockade of H₂-histaminic receptors.
- A. Ranitidinum.
 - B. Extracti Belladonnae.
 - C. Atropini sulfas.
 - D. Methacinum.
 - E. Platyphyllini hydrotartras.

6. A 25 year-old man, suffering from peptic ulcer of the stomach, has been treated with omeprazole. In 3 weeks the ulcer was healed. What mechanism of action does this drug produce?

- A. Blockade of synthesis of Gastrin.
- B. Blockade of M-cholinoceptors.
- C. Blockade of $H^+ - K^+ - ATP$ -ase (the proton pump).
- D. Blockade of $Na^+ - K^+ - ATP$ ase.
- E. Blockade of H_2 -histaminic receptors.

7. Indicate the drug to stimulate appetite, mechanism of action of which is associated with irritation of the mucus membrane of the oral cavity, which leads to reflex excitation of the hunger center in the hypothalamus.

- A. Fenfluraminum.
- B. Phepranonum.
- C. Desopimonomum.
- D. Tinctura Absinthii.
- E. Orlistatum.

8. A 32 year old patient had been suffering from the ulcer of the duodenal bulb was treated with Famotidine which caused him to feel better. Indicate the mechanism of action of this agent.

- A. Inhibition of gastrin release.
- B. Blockade of H_2 -histaminic receptors.
- C. Suppression of the function of the gastric mucosal cells.
- D. Decrease of release of hydrochloric acid.
- E. Decrease of pepsin release.

9. Indicate the mechanism of anorectic action of Phepranone.

- A. Oppresses the afferent endings of the vagus nerve.
- B. Blocks M- cholinoceptors.
- C. Activates H_2 -histamine receptors in the stomach.
- D. Blocks N-cholinoceptors of vegetative ganglions.
- E. Inhibit hunger center.

10. Indicate the synthetic drug increasing bile secretion:

- A. Drotaverini hydrochloridum (No-Spa).
- B. Apomorphini hydrochloridum.
- C. Cimetidinum.
- D. Oxaphenamidum.

E. Almagelum.

11. Indicate the agent which stimulates contraction of gall bladder smooth muscle and causes evacuation of bile into the intestine?

- A. Magnesium sulfas.
- B. Misoprostolum.
- C. Ranitidinum.
- D. Contrycalum.
- E. Drotaverini hydrochloridum (No-Spa).

12. Indicate the agent which may be used in an attack of biliary colic to relax smooth muscles?

- A. Panzinormum.
- B. Atropini sulfas.
- C. Analginum.
- D. Pentazocinum.
- E. Cholosasum.

13. A 40 years old patient was admitted to the hospital with the biliary colic attack. What agent should be administered parenterally in this case?

- A. Pancreatinum.
- B. Almagelum.
- C. Drotaverini hydrochloridum (No-spa).
- D. Contrycalum.
- E. Metoclopramidum.

14. Indicate the drug from the group of myotropic spasmolytics which is suitable to eliminate pain in intestinal colic.

- A. Papaverini hydrochloridum.
- B. Proserinum.
- C. Piridostigmini hydrobromidum.
- D. Pilocarpini hydrochloridum.
- E. Prazosinum.

15. Indicate a cholagogic agent used for treatment of chronic cholecystitis.

- A. Almagelum.
- B. Tinctura Absinthii.
- C. Metoclopramidum.
- D. Allocholum.

E. Plathyphyllini hydrotartras.

16. Specify an agent from the group of hepatoprotectors which restores normal structure and function of hepatocytes, used in different liver diseases.

- A. Allochoium.
- B. Tetracyclinum.
- C. Cholenzymum.
- D. Tocopheroli acetat.
- E. Essentiale.

17. Indicate the drug, which is used in chronic pancreatitis, accompanied by enzymes insufficiency, for improvement of digestion processes.

- A. Festalum
- B. Pepsinum.
- C. Ranitidinum.
- D. Pirenzepinum.
- E. Cholosasum.

18. Why is contrycal used in the case of acute pancreatitis?

- A. It opens Oddies sphincter.
- B. It inactivates trypsin which causes autolysis of pancreas.
- C. It reduces the activity of hyaluronidase.
- D. It impairs secretion of trypsinogen.
- E. It oppresses secretion of bile.

19. Indicate the drug used in acute pancreatitis to reduce autolysis of the gland.

- A. Pepsinum.
- B. Chymotrypsinum.
- C. Pancreatinum.
- D. Contrycalum.
- E. Fibrinolysinum.

20. A 37-year-old man was admitted to the surgical department with the symptoms of pancreatitis: vomiting, diarrhea, bradycardia, hypotension, weakness, dehydration. What drug should be used first of all?

- A. Drotaverini hydrochloridum.
- B. Famotidinum.

- C. Contrycalum.
- D. Platyphyllini hydrotartras.
- E. Atropini sulfas.

Assignment 5.

*Choose **all** correct answers:*

1. Omeprazole is characterized by:
 1. it is not active in alkaline medium
 2. in acidic medium it is turned into sulfenamid
 3. sulfenamid irreversibly blocks H/K-ATPase
 4. long duration of action (it is taken once a day)
 5. it is taken orally

2. In the case of subacid [acidulous] gastritis are used:
 1. succus gastricus naturalis
 2. pepsinum
 3. acidum hydrochloricum dilutum
 4. cyanocobalaminum
 5. phosphestrolum

3. Choose groups of drugs used in the case of gastric ulcer:
 1. inhibitors of the proton pump
 2. H₂-receptor antagonists
 3. M₁-cholonoblockers
 4. prostaglandins and their derivatives
 5. nonsteroidal anti-inflammatory drugs

4. Blockers of the proton pump are:
 1. Omeprazole
 2. Lansoprazole
 3. Rabeprazole
 4. Pantoprazole
 5. Prazosinum

5. Blockers of the proton pump:
 1. block proton pump directly
 2. destroy bacterial wall of *Helicobacter pylori*
 3. are prodrugs

4. block pump due to turning into sulfenamid
5. create a protective film on the ulcer

6. Omeprazole is taken:
 1. once a day
 2. three times per day
 3. once a week
 4. once a month
 5. intravenously by bolus

7. In the mechanism of action of bismuthate tripotassium dicitrate (De-Nol) are such important points as:
 1. creating of chelate complex with proteins
 2. selective covering of the ulcer surface
 3. bactericidal action with respect to H. pylori
 4. stimulation of pepsin secretion which destroys H. pylori
 5. choloretic action

8. Antacid drugs are:
 1. Almagel
 2. Maalox
 3. Fosfalugel
 4. Ranitidine
 5. Cimetidinum

9. Decrease gastric secretion:
 1. Pirenzepinum
 2. Omeprazolom
 3. Famotidinum
 4. gastrin
 5. pancreatinum

10. It is reasonable to prescribe in the case of gastric ulcer:
 1. Bismuthi subnitras
 2. Misoprostolum
 3. Carbenocsolonom
 4. Ranitidinum
 5. sucralfat

11. In the case of acute intoxication by a chemical agent it would be most reasonable to use:

1. Magnesii sulfas
2. Lactulosum
3. sea girdle (laminaria)
4. loperamidum
5. Natrii hydrocarbonas

12. In the case of acute pancreatitis it is needed to administrate:

1. Celecoxibum
2. Contricalum
3. Loperamidum
4. Lactulosum
5. Sulfazinum

13. Antiemetic blockers of dophamine receptors:

1. Tropisetron
2. Ondansetron
3. Metoclopramidum
4. Thiethylperazinum
5. Dimedrolum

14. In the case of chronic pancreatitis these drugs are used:

1. Pancreatinum
2. Panzynom forte
3. Creon
4. Festal
5. Flunisolidum

15. Choose blockers of H₂-hystamine receptors:

1. Cimetidinum
2. Famotidine
3. Ranitidine
4. Nizatidine
5. Carbenocsolonum

16. Choose H₂-receptor blockers with antiandrogenic action (side effect):

1. Cimetidinum
2. Famotidinum

3. Ranitidinum
4. Nizatidinum
5. Domperidonum

17. Omeprazole is used in the case of:

1. gastric ulcer
2. duodenal ulcer
3. ulcerative esophagitis
4. Crohn's disease
5. constipations

18. Purgatives are:

1. Bisacodylum
2. Macrogolum
3. Lactulosum
4. Smecta
5. Mucofalk

19. Bisacodylum is characterized by:

1. irritates chemoreceptor in the colon
2. increase motility and mucus production by the colon
3. onset of action in 6 hours after oral administration
4. onset of action in an hour after rectal administration
5. onset of action in an hour after oral administration if taken with 200 ml of warm water

20. Which of H₂-hystamine receptors may cause gynecomastia:

1. Famotidinum
2. Ranitidinum
3. Nizatidinum
4. Domperidonum
5. Cimetidinum

P. W. 6.

Theme:

Drugs acting on blood system

General questions:

1. Classification and general characteristics of drugs acting on blood system.
2. Agents acting on hemopoiesis. Erythropoiesis stimulants: mechanism of action, indications to use, drugs used in hypochromic and hyperchromic anemias, adverse effects. Erythropoiesis inhibitors.
3. Agents stimulating and inhibiting leukopoiesis. Classification, therapeutic uses, adverse effects.
4. Drugs affecting on hemostasis. Classification. Pharmacology of drugs decreasing coagulation.
5. Anticoagulants with direct and indirect action, mechanism of action, therapeutic uses, adverse effects.
6. Fibrinolytic drugs, mechanism of action, pharmacokinetics, therapeutic uses, adverse effects and contraindications.
7. Antiplatelet agents, mechanism of action, therapeutic uses.
8. Drugs increasing coagulation: classification, mechanism of action, therapeutic use, adverse effects.

Classification of drugs acting on blood system:

I. Drugs acting on hemopoiesis:

1. Agents stimulating erythropoiesis:

- Ferri sulfas
- Fercovenum
- Ferrum Lek
- Coamidum
- Acidum folicum
- Erythropoetinum

2. Agents inhibiting erythropoiesis:

- Natrii phosphas

II. Drugs acting on leucopoiesis:

1. Leucopoiesis stimulators:

- Natrii nucleinas
- Pentoxylum
- Methyluracylum

2. Leucopoiesis inhibitors:

- Novembichin
- Myelosan
- Mercaptopurine
- Dopan

II. Drugs acting on hemostasis:

1. Drugs decreasing coagulation:

a) Anticoagulants of direct action:

- Heparinum
- Nandroparinum (Fraxiparinum)
- Enoxiparinum (Clexanum)

b) Anticoagulants of indirect action:

- Warfarinum
- Syncumar
- Phenylinum

c) Fibrinolytic drugs:

- Streptoliasum
- Alteplasum (Actilise)

d) Antiplatelets:

- Acidum acetylsalicylicum (Aspirinum)
- Ticlopidinum (Tuclidum)
- Clopidogrelum (Plavix)
- Dipyridamolum (Curantilum)
- Pentoxyphyllinum (Trental)
- Absiximabum

2. Drugs increasing coagulation:

a) Coagulants (hemostatics)

- Fibrinogenum
- Thrombinum
- Vikasolum
- Calcii chloridum
- Calcii gluconas
- Etamsylatum (Dicenonum)

b) Fibrinolysis inhibitors:

- Contrycalum
- Acidum aminocapronicum

Home task on prescription:

1. Coamide in ampoules.
2. Acidi folice in powders.

3. Pentoxile in tablets.
4. Ferum Lek in ampoules.
5. Syncumar in tablets.
6. Vikasole in ampoules and tablets.
7. Methyluracile in tablets and suppositories.
8. Actilyse in flacons.
9. Calcii chloride in ampoules.

Educational research work

Assignment 1. *Prescribe:*

1. Fercovene in ampoules.
2. Cyanocobalamine in ampoules.
3. Natrii nucleinas in ampoules.
4. Warfarine in tablets.
5. Heparine in flacons.
6. Phenyline in tablets.
7. Streptoliase in ampoules.
8. Dipyridamole in tablets.
9. Thrombine in ampoules.
10. Etamsylate in ampoules and tablets.

Assignment 2. *Pharmaco-therapeutic task:*

1. Drugs for treatment of hypochronic anaemias.
2. Drugs for treatment of hyperchromic anaemias.
3. Drugs which stimulate leucopoiesis.
4. A synthetic analogue of vitamin K.
5. Anticoagulants of indirect action.
6. A directly acting anticoagulant.
7. A drug used for lysis of fresh thrombi.
8. An agent for the arrest of bleedings caused by increased fibrinolysis.
9. A drug which decreases thrombocytes aggregation.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4.

*Choose **one** correct answer:*

1. A patient with thromboembolism of veins of lower extremities had been prescribed some medicine. In 2 days hemorrhages appeared on his skin. What drug can cause such complication?

- A. Neodicumarinum.
- B. Dipyridamolum.
- C. Acidum acetylsalicylicum.
- D. Heparinum.
- E. Phenylinum.

2. After the examination of a 40-year-old man the diagnosis was made: hypochromic anemia. What drug should be prescribed for treatment?

- A. Cyanocobalaminum.
- B. Fercovenum.
- C. Pentoxylum.
- D. Heparinum.
- E. Vikasolum.

3. A doctor recommended a patient, who had an acute myocardial infarction, to take aside acetylsalicylice in the dose of 0.25 g once per 2 - 3 days during 3 - 4 months. What effect did the doctor count on?

- A. Antiaggregant.
- B. Antiinflammatory.
- C. Antipyretic.
- D. Analgesic.
- E. Vasodilative.

4. An 8-year-old child is being prepared for tonsilectomy. The analysis of blood has shown that the time of blood coagulation is increased (up to 7 minutes). What drug should be included (5 days before the operation) into the complex of therapeutic agents of the preparatory period first of all?

- A. Acidium aminocapronicum.
- B. Natrii chloridum.
- C. Vikasolum.
- D. Fibrinogenum.
- E. Alteplasum.

5. Acidum acetylsalicylicum (75 mg, daily) is prescribed to a patient, who had a myocardial infarction. With what purpose is the drug prescribed?

- A. Reduction of body temperature.
- B. Reduction of inflammation.
- C. Reduction of pain.
- D. Dilatation of coronary vessels.
- E. Reduction of thrombocytes aggregation.

6. A pregnant woman's blood analysis revealed megaloblasts and a high Color Index. The diagnosis is megaloblastic anemia. What drug should be prescribed to the patient?

- A. Acidium nicotinicum.
- B. Pyridoxini hydrochloridum.
- C. Acidium ascorbinicum.
- D. Cyanocobalaminum.
- E. Coamidum.

7. Long cyancobalamine treatment was prescribed to a patient with megaloblastic anemia developed after gastroectomy. A drug was injected intramuscularly. What advantage does the parenteral way have over the enteral?

- A. The drug is quickly eliminated.
- B. The drug is quickly absorbed.
- C. The drug circulates in blood for a long time.
- D. The drug is not metabolized in the liver.
- E. This way is effective in the absence of gastromucoprotein.

8. The patient was admitted to the traumatologic department due to fracture of chin bones, damages of soft tissues and massive bleeding. Examination revealed paleness of the skin, pain in palpation of area of trauma, swelling of the skin, bleeding on the whole surface of the wound. Specify a drug for local use to stop the bleeding.

- A. Thrombinum.
- B. Caicii chloridum.
- C. Vikasolum.
- D. Acidum aminocapronicum.
- E. Fercovenum.

9. Drugs delaying blood coagulation (anticoagulants) are used for prevention and treatment of thrombosis. Specify an anticoagulant which antagonist is protamine sulfate.

- A. Phenilinum.
- B. Neodicumarinum.
- C. Syncumarum.
- D. Heparinum.
- E. Natrii hydrocitrans.

10. A patient was delivered to a hospital with complaints of loss of appetite, decrease of body weight, fatigue, pain around the epigastric area. Examination of the blood revealed megaloblastic anemia. Specify the main agent for the treatment of this disease.

- A. Ferri lastas.
- B. Cyanocobalaminum.
- C. Acidum acethylsalicylicum.
- D. Fercovenum.
- E. Coamidum.

11. Specify the antagonist of the anticoagulants with indirect action.

- A. Pentoxylum.
- B. Fercovenum.
- C. Vikasolum.
- D. Protamini suifas.
- E. Contrykalum.

12. Specify the coagulant agent available for local use only (to stop bleedings from small blood vessels).

- A. Hemostatic sponge.
- B. Vikasolum.
- C. Calcii chloridum.
- D. Fibrinogenum.
- E. Aminocapronic acid.

13. Inhibition of leukopoiesis is observed in a 43 years old roentgenologist. Specify the agent to be used for stimulation of leucopoiesis.

- A. Acidum ascorbinicum.
- B. Fercovenum.
- C. Acidum folicum.
- D. Cyanocobalaminum.
- E. Pentoxylum.

14. Indicate the coumarin derivatives, anticoagulant of indirect action:

- A. Heparinum.
- B. Syncumar.
- C. Dipyridamolum.
- D. Vikasolum.
- E. Thrombinum.

15. Antagonist (antidote) of heparin is:

- A. Syncumar.
- B. Protamini sulfas.
- C. Vikasolum.
- D. Alteplasum.
- E. Calcii chloridum.

16. A patient with hypochromic anemia has splitting and loss of hair, increased nail brittleness and taste alteration. What is the mechanism of the symptoms development?

- A. Decreased production of calcitonine.
- B. Deficiency of vitamin A.
- C. Deficiency of iron-containing enzymes.
- D. Decreased production of thyroid hormones.
- E. Deficiency of vitamin B₁₂.

17. Indicate the mechanism of action of heparin:

- A. Inhibition of synthesis of the clotting factors in the liver.
- B. Inhibition of thrombin.
- C. Inhibition of the conversion of prothrombin to thrombin.
- D. Activation of profibrinolysin.
- E. Causes proteolysis of plasminogen molecules to plasmin.

18. Indicate the clinical use of cyanocobalamin:

- A. Leucopenia.
- B. Malignant megaloblastic anemia.
- C. Acute leucosis.
- D. Gout.
- E. Thyrotoxicosis.

19. Indicate the drug used locally for the arrest of hemorrhages from small vessels:

- A. Calcii chloridum.
- B. Heparinum.
- C. Protamini sulfas.
- D. Thrombinum.
- E. Vikasolum.

20. Indicate the mechanism of streptokinase action:

- A. Inhibition of synthesis of the clotting factors in the liver.
- B. Inhibition of thrombin.
- C. Inhibition of the conversion of prothrombin to thrombin.
- D. Inhibition of proteolytic enzymes.
- E. Facilitate the conversion of plasminogen to plasmin.

Assignment 5.

Choose all correct answers:

13. Drugs activating leukopoiesis

- 1. Cyanocobalaminum
- 2. Methyluracilum
- 3. Acidum folicum
- 4. Ticlopidine
- 5. Molgramostim
- 6. Leucogenum

14. Substitutes for Pentoxylum

- 1. Methyluracilum
- 2. Vicasolum
- 3. Natrii nucleinas
- 4. Warfarin
- 5. Fercovenum

15. Cyanocobalaminum

- 1. is a synonym for vitamin B12
- 2. is used in the case of malignant [pernicious] anemia
- 3. has steroid structure
- 4. is used in leucopenia
- 5. has fibrinolytic activity
- 6. activates folic acid

16. Iron preparations are effective in the case of

1. malignant anemia
2. acute loss of blood
3. hypochromic anemia
4. anemia of pregnancy
5. chronic bleeding

17. Following drugs can be used intravenously

1. Ferri lactas
2. Ferrosi sulfas
3. Fercovenum
4. Haemostimulinum
5. Ferrum lek
6. Ferroplex

18. Methyluracilum and pentoxylum

1. stimulate gluconeogenesis
2. stimulate regeneration
3. are anticoagulants
4. are used in the case of leucopenia
5. increase coagulability

19. Ferric iron preparations are

1. Ferrosi sulfas
2. Fercovenum
3. Fercobitolum
4. Ferrum lek
5. Ferroplex

20. Acidum folicum

1. has anti-inflammatory action
2. is essential for synthesis of glycogen
3. is well soluble in the water
4. is a cofactor in the synthesis of nucleic acids
5. is synthesized by gut organisms

21. Plasma factors of blood coagulation are following

1. plasmin
2. calcium ions

3. prothrombin
4. thromboplastin
5. heparin

22. Following agents depress aggregation

1. Heparinum
2. Acidum acetylsalicylicum
3. Dipyridamolum
4. Pentoxifyphyllin
5. Acidum aminocapronicum
6. Ticlopidine

11. Thrombin is used to stop bleeding

1. only intravenously
2. only topically
3. intramuscularly
4. orally

12. These preparations contain cobalt

1. Fercovenum
2. Ferbitolum
3. Acidum folicum
4. Cyanocobalaminum
5. Neodicumarinum
6. Coamidum

13. In the case of hypochromic [erythronormoblastic] anemia are used

1. Feri sulfas
2. Ferrum lek
3. Acidum folicum
4. Acenocumarol
5. Heparin

14. The feed back principle use following drugs

1. Phenylinum
2. Pentoxylum
3. Acidum acetylsalicylicum
4. Methyluracilum
5. Natrii nucleinas

6. Vicasolum

15. To stop different kinds of bleeding are used

1. Heparinum
2. Vikasolum
3. Warfarin
4. Acidum aminocapronicum
5. Thrombin
6. Acidum acetylsalicylicum

16. Factors which enhance ferrum absorption

1. Acidum ascorbinicum
2. Hydrochloric acid
3. milk
4. intrinsic factor
5. external factor

17. Antiaggregatory action have

1. Prostacyclin
2. Thromboxane
3. Methylxanthine
4. Acidum acetylsalicylicum
5. Adrenalinum

18. Thromboxane

1. is a derivative of arachidonic acid
2. is synthesized in the platelets
3. is synthesized by endothelium
4. decreases aggregation
5. increases aggregation
6. is a synergist of prostacyclin

19. Drugs which are able to increase level of cyclic adenosine monophosphate in platelets

1. Dipyridamolum
2. Vicasolum
3. Prostacyclin
4. Atropinum
5. Acidum aminocapronicum

20. Overdosing of acenocumarol

1. may cause bleeding
2. increases aggregation
3. requires administration of protamini sulfas
4. requires administration of vitamin K preparations
5. requires administration of heparinum
6. may cause dysfunction of the liver

P. W. 7.

Theme:

Antiseptics and disinfectants.

General questions:

1. Conception of antiseptics and disinfectants, their principal difference from chemotherapeutic antimicrobial drugs. Classification.
2. Main mechanisms of action of antiseptics and disinfectants.
3. Non-organic antiseptics. Pharmacology of oxidizing agents, mechanism of action, indications for use.
4. Halogens: chlorine and iodine containing drugs, mechanism of action, indication for use.
5. Mechanism of antimicrobial action of heavy metal salts, their use. Symptoms of poisoning and measures of urgent help.
6. Acids and alkalis, properties, mechanism of action, their use in medical practice.
7. Organic antiseptics. Agents which belong to aliphatic drugs (alcohols and aldehydes), mechanism of action, their use in medical practice.
8. Characteristics of agents which belong to aromatic group (phenol compounds).
9. Pharmacological characteristics of dyes, mechanism of action, indication for use.
10. Nitrofurans derivatives, mechanism of action, indication for use.
11. Characteristics of detergents, their use in medical practice.

Classification of antiseptics and disinfectants:

I. Inorganic antiseptics:

1. Halogens:

A) Chlorine containing:

- Chloraminum
- Chlorhexidinum

B) Iodine containing

- Sol. Iodi spirituosa
- Sol. Lugoli
- Ioddicerinum

2. Oxidizers:

- Sol. Hydrogenii peroxydi diluta
- Kalii permanganas

3. Heavy metallic salts:

A) Silver compounds:

- Argenti nitras
- Protargolum
- Collargolum

B) Mercury salts:

- Hydrargyri dichloridum
- Ung. Hydrargyri oxydum flavum

C) Copper compounds:

- Cupri sulfas

D) Zinc compounds:

- Zinci sulfas
- Zinci oxydum

4. *Acids and alkalis:*

- Acidum boricum
- Acidum salicylicum
- Acidum benzoicum
- Natrii tetraboras
- Sol. Ammonii caustici

II. Organic antiseptics:

1. *Aliphatic agents (aldehydes and alcohols):*

- Sol. Formaldehydi
- Spiritus Aethilicus

2. *Phenol derivatives:*

- Phenolum purum
- Resorcinum
- Vagotilum
- Ichthyolum
- Pix liquida Betulae

3. *Dyes:*

- Viride nitens
- Methylenum coeruleum
- Aethacridini lactase

4. *Nitrofurans derivatives:*

- Furacillinum
- Furazolidonum

5. *Detergents:*

- Cerigelum
- Chlorhexidinum
- Aethonium

- Roccal
- Sapo viridis

Home task on prescription:

1. Sol. Hydrogenii peroxidi dilutea in flacons.
2. Sol. Iodi spirituosae in ampoules.
3. Viride nitens in flacons.
4. Furazolidone in tablets.
5. Ointment of Hydrargyri oxide flave.
6. Eye drops of Aethonie.
7. Cerigely in flacons.
8. Pasta of Acide salicylice.
9. Sol. of Chloramine.

Educational research work

Assignment 1. Prescribe:

1. Solutiones of Kalii permanganas.
2. Ioddicerine in flacons.
3. Ointment of Acide borice.
4. Sol. of Aethacridini lactase.
5. Furacilline in tablets.
6. Argenti nitras in eye drops.
7. Ointment of Zinci oxide.
8. Formaldehyde in flacons.

Assignment 2. Pharmaco-therapeutic task:

1. Agents for sterilization of surgeon's hands.
2. An antiseptic from the group of oxidizers used for gastric lavage.
3. An antiseptic from the group of oxidizers for washing of purulent wounds.
4. A nitrofurane derivative for rinsing of the throat.
5. An iodine preparation used as antiseptic and cauterize agents.
6. Agents for sterilization of medical instruments.
7. Phenol derivatives for treatment of skin diseases.

Assignment 3. Individual work.

Drugs	Dosage forms	Indication to use

Assignment 4. Test of control of the knowledge:

1. A patient with mercury poisoning was delivered to a toxicological department from a chemical plant. What drug should be used in this situation?

- A. Izonitrozinum.
- B. Unithiolum.
- C. Naloxonum.
- D. Carbo activatus.
- E. Enterosgelum.

2. To prepare an operative field a doctor used a dichlorinated biguanid derivative. It is the most active local antiseptic, shows fast and strong bactericidal action on Gram-negative and Gram-positive bacteria. What drug is this?

- A. Furacillinum.
- B. Viride nitens.
- C. Chloraminum.
- D. Phenasalum.
- E. Unithiolum.

3. For the processing of the burn surface of the patient's skin a specific drug was used. Its antiseptic properties are provided by free oxygen that reacts with organic substances. What drug is this?

- A. Furacillinum.
- B. Kalii permanganas.
- C. Chlorhexidini bigluconas.
- D. Acidum boricum.
- E. Natrii hydrocarbonas.

4. The patient addressed to the doctor in relation with trauma of the foot. The foot was bandaged with a dirty gauze bandage, impregnated with purulent discharges. Attempt to take off a bandage for survey and processing of a wound invoked an acute pain as the bandage had stuck to wound surface. Choose an antiseptic which will facilitate taking off of a bandage and will mechanically clear a wound of mud and pus.

- A. Sol. Hydrogenii peroxidi.
- B. Aethacridini lactas.
- C. Aethonium.
- P. Kalii permanganas.

E. Furacillinum.

5. The patient addressed to the doctor with complaints of pustular pimples on the skin of the face. In bacteriological analysis of contents of pustules staphylococcus aureus was found and the diagnosis of staphylococcal pyoderma was given. Choose the most efficient drug from the listed antiseptics for local use in pustular pimples.

- A. Chlorhexidinum.
- B. Spiritus aethylicus.
- C. Viride nitens.
- D. Kalii permanganas.
- E. Aethacridini lactas.

6. A patient addressed to an ophthalmologist with complaints of eye discomfort, discharge of purulent exudate, disorders of vision. Specify the antiseptic available for rinsing of the eyes.

- A. Sol. Iodi spirituosae.
- B. Argenti nitras.
- C. Kalii permanganas.
- D. Acidum salicylicum.
- E. Sol. Ammonii caustici.

7. In a patient with varicose dilation of veins the trophic ulcer of the leg developed. The bacteriological examination of the ulcer discharge revealed Staphylococcus infection. For the local treatment of the ulcer an antiseptic in the form of ointment from the group of detergents was administered. Specify it.

- A. Kalii permanganas.
- B. Viride nitens.
- C. Furacillinum.
- D. Aethonium.
- E. Aethacridini lactas.

8. Which acid possesses the properties of an antiseptic?

- A. Acidum boricum.
- B. Acidum nicotinicum.
- C. Acidum folicum.
- D. Acidum ascorbinicum.
- E. Acidum dehydrocholicum.

9. Specify the antiseptic which is used for disinfection of operation field and surgeon's hands.

- A. Aethonium.
- B. Furacillinum.
- C. 70% solution of Spiritus aethylicus.
- D. Kalii permanganas.
- E. 95% solution of Spiritus aethylicus.

10. Determine the following drug: it contains an halogen, exerts antimicrobial and deodorizing action, is used for disinfection of non-metal instruments, as an antiseptic - for processing of hands

- A. Sol. Hydrogenii peroxidi.
- B. Chloraminum.
- C. Formaldehydum.
- D. Phenolum.
- E. Resorcinum.

11. A patient was admitted into the emergency department in relation with acute poisoning - by mistake he drank mercury dichloride solution. The patient complained of severe pain in the oral cavity, along the esophagus and in the epigastric area, hypersalivation, fatigue, and tachycardia. Specify the agent which would neutralize the absorbed mercury binding to it.

- A. Furosemidum.
- B. Glucosum.
- C. Natrii hydrocarbonas.
- D. Natrii nitras.
- E. Unithiolum.

12. All antiseptics possess all following properties except:

- A. Bactericidal action.
- B. Versatile antimicrobial action.
- C. Selective antimicrobial action.
- D. Highly toxic for human.
- E. Are not introduced parenterally.

13. Formaldehyde solution is used for disinfection of non-metallic surgical tools. Indicate the correct name of drug group of formaldehyde:

- A. Aliphatic agents.
- B. Aromatic agents.

- C. Spirits.
- D. Halogen-maintained agents.
- E. Detergents.

14. 70% solution of ethyl spirit was used by a surgeon for cleaning his hands before operation. Explain the mechanism of action of the antiseptic drug:

- A. Blockade of sulfhydryl groups of enzymes.
- B. Protein dehydration of microbes' protoplasm.
- C. Oxidation of organic components of microbes' protoplasm.
- D. Interaction with aminogroups of protoplasm proteins of microbes.
- E. Interaction with hydroxyl groups of microbes enzymes.

15. A doctor used 5% spirituous solution of iodine for cleaning of operation field. Indicate its mechanism of action:

- A. Dehydration protoplasm proteins.
- B. Interaction with amino groups of microbes' proteins that disposes to their denaturation.
- C. Bound to enzymes' sulfhydic groups.
- D. Formation of albuminates.
- E. Inhibition of dehydrogenase.

16. Which antiseptic should be used for cleaning of surgical tools?

- A. Furacillinum.
- B. Aethonium.
- C. Kalii permanganas.
- D. 96% solution of Spiritus aethylicus.
- E. 70% solution of Spiritus aethylicus.

17. Indicate the mechanism of antimicrobial action of Kalii permanganas?

- A. Oxidation of organic compounds in cytoplasm of microorganisms.
- B. Blockade of sulfhydryl groups of the enzyme systems of microorganisms.
- C. Dehydration of microbial cells leading to denaturation of proteins.
- D. Interaction with NH-groups of microorganisms' proteins.
- E. Formation of albuminates.

18. Indicate the mechanism of antimicrobial action of heavy metal compounds?

- A. Oxidation of organic compounds in cytoplasm of microorganisms.
- B. Blockade of sulfhydryl groups of the enzyme systems of microorganisms.
- C. Dehydration of microbial cells leading to denaturation of proteins.
- D. Interaction with NH-groups of microorganisms' proteins.
- E. Formation of albuminates.

19. Indicate the antiseptic which belong to the group of oxidizers.

- A. Chloraminum.
- B. Argenti nitras.
- C. Furacillinum.
- D. Kalii permanganas.
- E. Acidum boricum.

20. Indicate the antiseptic which belong to the group of detergents.

- A. Chloraminum.
- B. Furacillinum.
- C. Cerigelum.
- D. Kalii permanganas.
- E. Acidum boricum.

P. W. 8.

Theme:

Chemotherapeutic drugs. Antibiotics.

General questions:

1. Classification of the antimicrobial chemotherapeutic drugs and basic principles of their use.
2. Classifications according to chemical structure; to mechanism of action; to types of action; to spectrum of action; classification in nature of antibiotics.
3. B-lactam antibiotics, mechanism of action. Penicillins: classification, pharmacokinetics, mechanism of action, pharmacologic effects and therapeutic uses.
4. Classification of semisynthetic penicillins, pharmacokinetics, pharmacodynamics, adverse effects.
5. Cephalosporins. Classification (I, II, III, IV generations), mechanism of action, pharmacokinetics, pharmacologic effects, therapeutic uses, adverse effects.
6. Carbapenems and monobactams: pharmacokinetics, pharmacologic effects, therapeutic uses, adverse effects.
7. Pharmacology of Aminoglycosides: mechanism of action, pharmacokinetics, pharmacologic effects, therapeutic uses, adverse effects.
8. Tetracyclines: classification, mechanism of action, pharmacokinetics, pharmacologic effects, therapeutic uses, adverse effects.
9. Pharmacologic effects of Levofloxacin, therapeutic uses and adverse effects.
10. Macrolides and azalides: first and second generation.
11. Lincosamides and Glycopeptides: pharmacokinetics, therapeutic uses, adverse effects.
12. Polypeptides: pharmacokinetics, mechanism of action, therapeutic uses, adverse effects.

Classification of antibiotics:

I. Beta-lactam antibiotics:

1. Penicillins:

A) Native penicillins:

drugs of short action:

- Benzylpenicillinum-natrium

- Benzylpenicillinum kalium

drugs of long action:

- Benzylpenicillinum-novocainum
- Bicillinum-1, 3, 5

drugs for oral administration:

- Penicillin G
- Penicillin V (phenoxymethylpenicillinum)

B) Semisynthetic penicillins:

penicillinase-resistant penicillins:

- Oxacillinum-natrium
- Methicillinum
- Cloxacillinum
- Naficillinum
- Dicloxacillinum

broad spectrum penicillins:

- Ampicillinum
- Amoxicillinum
- Bacampicillinum
- Cyclacillinum

antipseudomonas penicillins:

- Carbenicillinum
- Ticarcillinum
- Mezlocillinum

2. *Cefalosporins:*

I generation:

- Cefazolin
- Cefalexinum
- Cefadroxilum
- Cefalotinum
- Cefapirinum

II generation:

- Cefaroximum
- Cefaclor
- Cefotetanum
- Cefoxitinum

III generation

- Cefaperazonum
- Cefpiramidum
- Ceftriaxonum

- Cefiximum
- Ceftizoxinum

IV generation:

- Cefipimum
- Cefpiromum
- Cefclidinum
- Cefosopranum

3. *Monobactams:*

- Aztreonamum

4. *Carbopenems:*

- Thienamum (Imipenemum)
- Meropenemum

II. Macrolides and Azalides:

I generation:

- Erythromycinum
- Oleandomycini phosphas

II generation:

- Azithromycinum (Azalide)
- Clarithromycinum
- Roxithromycinum
- Spiramycinum

III. Aminoglycosides:

I generation:

- Streptomycinum
- Monomycinum
- Neomycinum
- Kanamycinum

II generation:

- Gentamycinum

III generation:

- Tobramycinum
- Amikacynum

IV generation

- Isopamycinum
- Dactinomycinum
- Arbecacinum

IV. Tetracyclines

- Oxytetracyclinum
- Tetracyclinum

- Doxycyclinum
- Methacyclinum
- Minocyclinum

V. *Laevomycetines:*

- Laevomycetinum

VI. *Glycopeptides:*

- Vancomycinum
- Teicoplaninum

VII. *Polypeptides:*

- Polymixinum M sulfas
- Polymixinum B sulfas

VIII. *Lincosamides:*

- Clindamycin
- Lincomycin

IX. *Other antibiotics.*

Home task on prescription:

1. Benzylpenicillin-natrium in flacons.
2. Bicilline-5.
3. Ampiciline-natrium in flacons.
4. Amoxycilline in capsules and flacons.
5. Cefataxime (Claforan) in flacons.
6. Doxycycline hydrochloride in tablets and capsules.
7. Ointment of Gentamycine sulfas.
8. Lincomycine hydrochloride in ampoules.
9. Amikacyne sulfas in flacons.
10. Laevomycetinum in tablets.

Educational research work

Assignment 1. Prescribe:

1. Oxacilline-natrium in tablets and flacons.
2. Cefpirome in flacons.
3. Asactam in flacons.
4. Tetracycline hydrochloride in tablets and ointment.
5. Ceftriaxone-natrium in flacons.
6. Erythromycine in capsules.
7. Ointment of Neomycine sulfas.
8. Spiramycine (Rovamycine) in tablets.
9. Azithromycine in capsules.

10. Polymyxine M sulfas in flacons.

Assignment 2. Pharmacotherapeutic task:

1. An antibiotic from the group of semisynthetic penicillins, which is resistant to penicillinase produced by Staphylococci.
2. Native penicillins of long-lasting action.
3. An antibiotic from the group of semisynthetic penicillins with wide spectrum of action.
4. Antibiotics from third generation of cephalosporins for treatment bacterial meningitis.
5. An antibiotic from the second generation of aminoglycosides.
6. An antibiotic from the first generation of macrolides.
7. Semisynthetic Tetracyclines for treatment venereal infections.
8. Antibiotics from the group of glycopeptides.

Assignment 3. Individual work.

Drugs	Dosage forms	Indication to use

Assignment 4. Test of control of the knowledge:

1. A pregnant woman had acute tracheobronchitis. An antibiotic of penicillin group was chosen for this infection treatment. What is it?

- A. Streptomycini sulfas.
- B. Gentamycifii sulfas.
- C. Amoxicillinum.
- D. Tetracycline hydrochloridum.
- E. Furacilinum.

2. A 10-year-old child had staphylococcal dermatitis. The treatment with benzylpenicillin sodium was ineffective. The combination of ampicillin with clavulane acid gave a prompt positive result. What is the role of clavulane acid in this case?

- A. Activation of phosphodiesterase.
- B. Inhibition of β -lactamase.
- C. Inhibition of adenosine deaminase.
- D. Inhibition of transpeptidase.
- E. Blockade of translocase.

3. A 37-year-old patient is hospitalized to a venerologic dispensary with syphilis diagnosis. What drug should be prescribed for the treatment of the patient?
- A. Polymyxini sulfas.
 - B. Biseptol-480.
 - C. Nitroxolinum.
 - D. Laevomycesinum.
 - E. Benzylpenicillinum-natrium.
4. A patient with pneumonia was prescribed the third generation cephalosporin (not absorbed in the digestive system, active to Gram-negative microorganisms). It is resistant to β -lactamase, has a wide spectrum effect. A distinctive feature of this drug is its long-term stay in human body. What is it?
- A. Ceftriaxonum natrium.
 - B. Cefazolinum.
 - C. Cefaloridinum.
 - D. Rifampicinum.
 - E. Kanamycinum.
5. A 19-year-old patient has primary syphilis. He gets a complex therapy. Benzylpenicilline sodium is a part of this therapy. What is the mechanism of the action of this drug?
- A. Blockade of RNA synthesis.
 - B. Blockade of cytoplasm proteins synthesis.
 - C. Blockade of thiol enzyme groups.
 - D. Blockade of microbe membrane peptidoglycane synthesis.
 - E. Blockade of DNA synthesis.
6. The patient with the diagnosis of cholera was admitted to the infectious diseases hospital. Specify a group of antibiotics of the first choice for treatment of this disease.
- A. Penicillins.
 - B. Aminoglycosides.
 - C. Tetracyclines.
 - D. Macrolids.
 - E. Cefalosporins.
7. A patient started to complain of worsening of audition after treatment with antibiotic because of purulent complication after the surgical operation. Specify the group of antibiotics which possess ototoxic activity.

- A. Macrolids.
- B. Penicillins.
- C. Tetracyclines.
- D. Polymyxins.
- E. Aminoglycosides.

8. A patient was delivered to the surgical department with anaerobic gangrene. Specify the antibiotic of first choice for the treatment of this infection.

- A. Tetracyclinum.
- B. Benzylpenicillinum natrium.
- C. Clindamycinum.
- D. Cefazolinum.
- E. Chloramphenicolum.

9. Specify the main antibiotic for the treatment of diphtheria.

- A. Erythromycinum.
- B. Laevomycetinum.
- C. Cefazolinum.
- D. Gentamycinum.
- E. Tetracyclinum.

10. A woman addressed to a dentist with complaints of teeth destruction in her little child. It was revealed that during pregnancy the woman took antibiotics. Specify the group of antibiotics that could cause these side-effects.

- A. Cephalosporins.
- B. Macrolides.
- C. Penicillins.
- D. Tetracyclines.
- E. Aminoglycosides.

11. Specify the group of antibiotics whose mechanism of action is connected with inhibition of synthesis of bacterial cell wall.

- A. Lincosamides.
- B. Macrolides.
- C. Tetracyclines.
- D. Aminoglycosides.
- E. Penicillins.

12. Specify the most typical side-effect of penicillins.

- A. Allergic reactions.
- B. Agranulocytosis.
- C. Anemia.
- D. Decrease of audition.
- E. Hepatotoxic influence.

13. Specify the group of antibiotics whose mechanism of action involves inhibition of protein synthesis by microorganisms.

- A. Cephalosporins.
- B. Penicillins.
- C. Tetracyclines.
- D. Monobactams.
- E. Polymyxins.

14. 56-years old male was admitted to a hospital with pneumonia. It is known he suffers from hay fever and seasonal vasomotor rhinitis. What drug should be administered in the case?

- A. Ampicillinum.
- B. Benzylpenicillinum.
- C. Bicillinum.
- D. Oxacillinum.
- E. Cefazolinum.

15. Determine drug with wide spectrum of antibiotic activity, a basic antibiotic agent of treatment enteric fever and other salmonellosis and possesses following side effects: oppresses of bone marrow activity, disbacteriosis and dyspeptic disorders:

- A. Laevomycetinum
- B. Phthalazolum.
- C. Benzylpenicillin natrium.
- D. Neomycini sulfas.
- E. Tetracyclinum.

16. Indicate antibiotic with significant ototoxic activity:

- A. Laevomycetinum.
- B. Tetracyclinum.
- C. Penicillinum.

- D. Erythromycinum.
- E. Streptomycinum.

17. A patient developed osteomyelitis after open fracture. Choose an antibiotic that is able to be cumulated within bone tissue and the most reasonable in this case:

- A. Benzylpenicillinum.
- B. Laevomycetinum (chloramphenicol).
- C. Rifampicinum.
- D. Lincomycinum.
- E. Streptomycinum.

18. Indicate drug able to create high concentration in cerebrospinal liquor with oral and intramuscular introduction:

- A. Laevomycetinum.
- B. Benzylpenicillinum,
- C. Gentamycinum.
- D. Cefazolinum.
- E. Oxaciilinum.

19. Infectious agent determined by lab tests is known to be sensitive to third generation cephalosporins. Choose the drug for treatment:

- A. Cefazolinum.
- B. Cefalexinum.
- C. Cefalotinum
- D. Cephtriaxonum.
- E. Cefaloridinum.

20. What drug can cause myorelaxing, ototoxic, teratogenic and mutagenic action?

- A. Penicillinum.
- B. Tetracyclinum.
- C. Streptomycinum.
- D. Laevomycetinum (chloramphenicolum).
- E. Dicloxacillinum.

P. W. 9-10.

Theme:

Sulfonamides. Quinolones. Antifungal agents. Antituberculous and antiviral drugs.

General questions:

1. Sulfonamides: classification, spectrum and type of action, mechanism of action.
2. Pharmacodynamics and pharmacokinetics of sulfonamides. Indication to use. Side effects and ways of its prevention.
3. Combined preparations of sulfonamides, therapeutic uses.
4. Quinolones of first, second and third generation. Mechanism of action, pharmacodynamics and pharmacokinetics, therapeutic use, adverse effects.
5. Antifungal agents: classification, mechanism of action, pharmacodynamics, pharmacokinetics, therapeutic use, adverse effects.
6. Classification of agent used for treatment of tuberculosis.
7. Antituberculous drugs of group A (the most effective): mechanism of action, pharmacokinetics, therapeutic use, adverse effects.
8. Pharmacologic characteristics and therapeutic uses of the group B and C.
9. Antiviral agents: classification, mechanism of action, pharmacokinetics, therapeutic uses, adverse effects.

Classification of Sulfonamides:

I. Sulfonamides which are well absorbed:

1. Short acting:

- Sulfadimezinum
- Aethazolum

2. Long acting:

- Sulfadimethoxinum
- Sulfapyridazinum

3. Ultra long acting:

- Sulfalenum

II. Sulfonamides which are not absorbed:

- Phthalazolum
- Phthazinum
- Sulginum

III. Sulfonamides for local action:

- Sulfacylum-natrium
- Aethazolum

- Argosulphanum

IV. Combination of sulfonamides:

- Biseptolum

Classification of Quinolones:

1. First generation:

- Nitroxolinum

2. Second generation:

- Acidum nalidixicum
- Acidum oxolinicum

3. Third generation:

- Ofloxacinum
- Ciprofloxacinum

Classification of antifungal agents:

1. Antibiotics:

- Amphotericinum B
- Nystatinum
- Levorinum

2. Synthetic agents:

- Itraconazolum
- Ketoconazolum
- Miconazolum
- Fluconazolum
- Clotrimazolum

Classification of antituberculosis drugs:

1. Group A (the most effective):

- Rifampicinum
- Isoniazidum

2. Group B (effective):

- Streptomycini sulfas
- Kanamycinum
- Florymycini sulfas
- Cycloserinum
- Amikacinum
- Ethionamidum
- Protionamidum
- Pyrazinamidum
- Ethambutolum
- Ofloxacinum

3. Group C (less effective):
- Natrii paraaminosalicylas
 - Thioacetazonum

Classification of antiviral agents:

1. *Drugs for influenza treatment:*
- Remantadinum
 - Midantanum
 - Oxolinum
2. *Drugs for herpes infection treatment:*
- Idoxuridinum
 - Acyclovir
 - Gancyclovir
3. *Anti-HIV agents:*
- Zidovudinum (Azidotimidinum)
 - Didanosinum
 - Zalcitabinum
4. *Immunomodulators:*
- Gamma-globulinum
 - Interferonum
 - Laferonum

Home task on prescription:

1. Sulfadimezine in tablets.
2. Sulfacyle-natrii in eye drops.
3. Sulfalene in tablets.
4. Furazolidone in tablets.
5. Acide nalidixice in capsules.
6. Amphotericine B in flacones.
7. Ointment of Clotrimazole.
8. Isoniazide in tablets.
9. Ethambutole in tablets.
10. Acyclovire in capsules.

Educational research work

Assignment 1. Prescribe:

1. Phtalazole in tablets.
2. Bactrim (Biseptole – 480) in tablets.
3. Sulfapyridazine in tablets.

4. Nitroxoline in dragee.
5. Ciprofloxacin in ampoules.
6. Nystatin in suppositories.
7. Itrakonazole (Orungal) in capsules.
8. Pirazinamide in tablets.
9. Rifampicin in capsules.
10. Cycloserine in tablets.

Assignment 2. *Pharmaco-therapeutic task:*

1. A sulfonamide with prolonged action.
2. A sulfonamide in eye drops for treatment of infectious of the eyes.
3. Combined sulfonamide used for treatment of respiratory and urinary tract infection.
4. Quinolones of third generation for treatment of respiratory and urinary tract infection.
5. An antifungal antibiotic for the treatment of superficial candidiasis.
6. A drug for the treatment of deep and systemic mycoses.
7. An imidazole derivative with wide spectrum of antifungal action.
8. The most effective antituberculous agents.
9. Drugs for influenza treatment.
10. Drugs for herpes infection treatment.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4. Test of control of the knowledge:

1. After the treatment by a highly effective antituberculous drug a 40-year-old female patient developed signs of optic neuritis, memory impairment, and cramps. What drug did the patient use?
 - A. Rifampicinum.
 - B. Isoniazidum.
 - C. PAS.
 - D. Ethambutolum.
 - E. Monomycinum.

2. A patient had syphilis. He was treated by bismuth drugs. Then such complications as grey spots on mucous tunic of the mouth and symptoms of

nephropathy appeared. What drug should be used as an antidote in the case of poisoning with bismuth drugs?

- A. Naloxonum.
- B. Nalorphini hydrochloridum.
- C. Bemegridum.
- D. Unithiolum.
- E. Methylenum coureleum.

3. A patient came to a doctor with complaints of urine and lacrimal liquid painted red. It is known from the patient's anamnesis that he was treated for pulmonary tuberculosis. What antituberculous drug became the cause of such complications?

- A. Isoniazidum.
- B. Rifampicinum.
- C. Ethionamidum.
- D. Streptomycini sulfas.
- E. Ethambutolum.

4. A 37-year-old patient is hospitalized to a venerologic dispensary with syphilis diagnosis. What drug should be prescribed for the treatment of the patient?

- A. Polymyxini sulfas.
- B. Biseptol-480.
- C. Nitroxolinum.
- D. Laevomycetinum.
- E. Benzylpenicillinum-natrium.

5. A patient with acute cystitis was prescribed a highly active antimicrobial drug (fluoroquinolone derivative). It has a wide spectrum bactericidal effect. The mechanism of its action is connected with the depression of the DNA-hydrase enzyme subunit. This drug negatively influences cartilaginous tissue. What drug is this?

- A. Bicillin-5.
- B. Laevomycetinum.
- C. Ciprofloxacinum.
- D. Benzylpenicillinum-natrium.
- E. Cefamezinum.

6. A doctor prescribed a sulfonamide to a patient with pneumonia. What mechanism of sulfonamide action provides the therapeutic effect?

- A. Competitive antagonism with para-aminobenzoic acid.
- B. Inhibition of the synthesis of microorganisms membrane.
- C. Increasing of the permeability of microorganisms membranes.
- D. Inhibition of the synthesis of microorganisms proteins.
- E. Blockade of the sulfhydryl groups of enzymes.

7. A drug which contains trimetoprim and sulfamethoxazole was used for the treatment of a patient with pharyngitis. It has high antimicrobial activity. The mechanism of its action is connected with double blocking effect on bacterial metabolism. Side effects: crystals formation, dyspeptic disorders, allergic reactions, hematosi depression. What drug is this?

- A. Sulfalenum.
- B. Phthalazolium.
- C. Sulfapyridazinum.
- D. Sulfadimethoxinum.
- E. Biseptol-480.

8. A patient with lung tuberculosis is treated with a drug which has a wide spectrum of antimicrobial action. Mycobacteria of tuberculosis are the most sensitive to it. Its effect is connected with the depression of RNA bacteria synthesis. Side effects: hepatotoxic action, allergic reactions. It paints urine, sputum, and lacrimal liquid red. What drug is this?

- A. Ethambutolum.
- B. Streptomycini sulfas.
- C. Rifampicinum.
- D. PAS.
- E. Isoniazidum.

9. The pulmonary form of tuberculosis was diagnosed. What drug was used for tuberculosis treatment?

- A. Tetracyclini hydrochloridum.
- B. Benzylpenicillinum-natrium.
- C. Sulfadimezinum.
- D. Isoniazidum.
- E. Furazolidonum.

10. After supercooling a patient has herpetic rash on the nose wings and upper lip. Ointment is applied for treatment. What antiviral drug does the ointment contain?
- A. Azidotimidinum.
 - B. Acyclovir.
 - C. Dexamethasonum.
 - D. Indometacinum.
 - E. Interferonum.
11. Acquired immune deficiency syndrome was diagnosed. What drug is the most expedient in this case?
- A. Interferonum.
 - B. Sulfalenum.
 - C. Cycloserinum.
 - D. Aethionamidum.
 - E. Azidotimidinum.
12. Prescribe an antimicrobial drug from fluoroquinolone group to a patient with acute cystitis.
- A. Cefalexinum.
 - B. Metronidazolum.
 - C. Cefazolinum.
 - D. Ampicillinum.
 - E. Ciprofloxacinum.
13. A child was delivered to a hospital with punctated white and yellowish spots on the mucous tunics of cheeks, palate, and tongue caused by *Candida albicans* fungus. Which of the following drugs is used for the treatment of the child?
- A. Cefalexinum.
 - B. Gentamycini sulfas.
 - C. Tetracyclini hydrochloridum.
 - D. Itraconazolum.
 - E. Benzylpenicillinum-natrium.
14. Indicate the drug which is used for intranasal dropping with the purpose of prophylaxis of influenza.
- A. Interferonum.
 - B. Remantadinum.

- C. Ampicillinum.
- D. Acyclovir.
- E. Paracetamolium.

15. Specify the agent which could be used for the prevention of influenza during epidemic period.

- A. Remantadinum.
- B. Biseptolum.
- C. Ampicillinum.
- D. Analginum.
- E. Paracetamolium.

16. Indicate antibiotic for treatment of tuberculosis:

- A. Tetracyclinum.
- B. Ampicillinum.
- C. Erythromycinum.
- D. Neomycinum.
- E. Rifampicinum.

17. After treatment by antituberculous drugs during three month, a patient developed daltonism, reduced ability to distinguish red and green colors. Which antituberculous agent can cause this side effect?

- A. Ethambutolum.
- B. Streptomycinum.
- C. PAS.
- D. Rifampicinum.
- E. Cycloserinum.

18. 1,5-years old girl with diagnosed acute herpetic stomatitis with eruptions. What drugs must be administered foremost?

- A. Antiallergic drugs.
- B. Antibiotics drugs.
- C. Antiseptics drugs.
- D. Keratopiastic drugs.
- E. Antiviral drugs.

19. Determine drug for AIDS treatment with following mechanism of action: it is able to be phosphorilated in cells and transformed to

triphosphate, and then it inhibits viral transcriptase and impede of DNA synthesis from viral RNA.

- A. Zidovudinum.
- B. Interferonum.
- C. Acyclovir.
- D. Ritonavir.
- E. Virasept.

20. A patient with herpetic stomatitis is treated with acyclovir locally. What is its mechanism of action?

- A. Inhibits synthesis of nucleic acids.
- B. Inhibits penetration of viruses in cells.
- C. Restrains maturation of viruses.
- D. Increases macroorganisms resistance to viruses
- E. Inhibits viruses assembling.

P. W. 11.

Theme:

Agents used for treatment of protozoal infections and malaria. Antihelminthic drugs

General questions:

1. Classification of antiprotozoal drugs.
2. Drugs used for treatment of malaria: classification, principles of treatment, action of drugs on different forms of plasmodium public and individual prophylaxis, adverse effects.
3. Antiamebial drugs: classification depending on their efficiency in various localization of the disease.
4. Pharmacokinetics and therapeutic uses of drugs used for treatment of lambliosis.
5. Drugs used for treatment of pneumocystosis and toxoplasmosis, mechanism of action, therapeutic uses, adverse effects.
6. Drugs used for treatment of trichomoniasis and trypanosomiasis.
7. Agents used for treatment leishmaniasis and leprosy: mechanism of action, pharmacokinetics, pharmacologic effects, adverse effects.
8. Antihelminthics: classification of drugs with wide spectrum of action, chemotherapy of cestodoses and nematodes.

Classification of Antiprotozoal drugs:

I. Drugs used for treatment of Malaria:

1. Quinoline derivatives:

A. 4-quinolines:

- Chingaminum
- Chinini sulfas

B. 8-aminoquinolines:

- Melfloquinum
- Primaquinum

2. Pyrimidine derivatives:

- Chloridinum
- Proguanilum

II. Antiamebial drugs:

- Metronidazolum
- Timidazolum
- Chiniofonum
- Tetracyclines

- Emetini hydrochloridum
- Chloroquinum
- Chingaminum

III. Drugs used for treatment of Lambliosis:

- Metronidazolum
- Tinidazolum
- Furazolidonum
- Tetracyclinum
- Doxycycline hydrochloridum

IV. Drugs used for treatment of Pneumocystosis and Toxoplasmosis:

- Pentamidum
- Chloridinum
- Sulfonamides

V. Drugs used for the treatment of Trichomoniasis:

- Metronidazolum
- Tinidazolum
- Tenonitrozolum
- Trichomonacidum
- Furazolidonum

VI. Drugs used for treatment of Trypanosomiasis:

- Pentamidum
- Melarsoprolum
- Nofurtimox
- Suraminum

VII. Drugs used for treatment of Leishmaniasis:

- Solusurminum
- Metronidazolum
- Pentamidum
- Amphotericinum B

VIII. Drugs used for treatment of Leprosy:

- Dapsonum

Classification of Antihelmintic drugs:

1. Drugs with wide spectrum of action:

- Mebendazolum
- Albendazolum

2. Chemotherapy of Cestodes:

- Niclosamidum (Phenasalum)

- Extractum Filicis maris spissum
 - Chloxylum
 - Stibii et Natrii tartras
3. *Chemotherapy of Nematodes:*
- Pyranteli palmoas
 - Piperazini adipinas
 - Thiabendazolum
 - Ivermectinum
 - Levamisolum
 - Naphthammonum
 - Diethylcarbamazonum
 - Praziquantelum

Home task on prescription:

1. Chingamine in tablets.
2. Mebendazole in tablets.
3. Pyrantele in suspension and tablets.
4. Chloridine in pulvis.
5. Bigumale in dragee.
6. Piperazini adipinas in flacones.
7. Solusurmine in ampoules.
8. Chinini hydrochloride in tablets.

Educational research work

Assignment 1. Prescribe:

1. Chingamine in ampoules.
2. Primachine in tablets.
3. Chinini hydrochloride in ampoules.
4. Metronidazole in suppositories.
5. Extr. Filicis maris spisse in capsules.
6. Timidazole in tablets.
7. Emethini hydrochloride in ampoules.
8. Aminochinole in tablets.

Assignment 2. Pharmaco-therapeutic task:

1. An agent effecting in trichomoniasis, amebiasis and lambliasis.

2. An antimalarial drug which is used for the prevention of subsequent recurrences of malaria and for the public chemoprophylaxis.
3. A pyrimidine derivative which is used mainly for the personal prevention of malaria.
4. An agent which is effective in skin and visceral leishmaniasis.
5. An antihelminthic agent with immunostimulating action.
6. An agent which is effective in ascariasis and enterobiasis.
7. Antihelminthic drugs of wide spectrum of action.

Assignment 3. *Individual work.*

Drugs	Dosage forms	Indication to use

Assignment 4. Test of control of the knowledge:

1. Systemic amebiasis with the lesion of the bowels, liver, and lungs was diagnosed in a 52-year-old patient. What drug should be prescribed?
 - A. Chloridinum.
 - B. Metronidazolum.
 - C. Tetracyclini hydrochloridum.
 - D. Chingaminum.
 - E. Emetini hydrochloridum.

2. A 37-year-old woman consulted a gynecologist concerning an inflammatory process in the vagina accompanied by itching and foamy vaginal discharge. The presence of mycotic infection was established by the bacterial analysis. What drug is effective in this case?
 - A. Metronidazolum.
 - B. Nystatinum.
 - C. Nitroxolinum.
 - D. Ampicillinum.
 - E. Erythromycinum.

3. Immunosuppressive agent, well-known as antimalarial drug, is prescribed for the treatment of systemic scleroderma. What drug should be preferred for this treatment?
 - A. Dexamethasonum.
 - B. Prednisolonum.

- C. Chingaminum.
- D. Metronidazolum.
- E. Cycloserinum.

4. Mixed helminthic invasion has been revealed (ascariasis and enterobiasis) in a patient. What antihelminthic drug with wide spectrum is expedient for use?

- A. Levamisolum.
- B. Mebendazolum.
- C. Pyrantelum.
- D. Chloxylum.
- E. Piperazini adipinas.

5. A patient with amebic dysentery was prescribed a drug, which also inhibits the development of the erythrocyte forms of malaria Plasmodium. What is it?

- A. Tetracyclinum.
- B. Emetini hydrochloridum.
- C. Chingaminum.
- D. Erythromycinum.
- E. Chinini sulfas.

6. A female patient addressed to the gynecologist with complaints of abundant discharges from vagina with unpleasant smell. After bacteriological investigation the diagnosis of trichomoniasis has been given. Specify the -drug which should be administered.

- A. Monomycinum.
- B. Sulfadimezinum.
- C. Chingaminum.
- D. Chloridinum.
- E. Metronidazolum (Trichopolum).

7. Mother addressed to the pediatrician with the child who complained of strong itch in the region around the anus, pain intensified at night. After investigation of feaces the diagnosis of enterobiasis was given. Indicate the drug which should be administered.

- A. Piperazini adipinas.
- B. Trichlorophenum.
- C. Phenasalum.

- D. Ditrazinum.
- E. Aminoacrichinum.

8. Indicate the antimalarial agent which is active against paraerythrocytic forms of Plasmodium.

- A. Hydroxychloroquinum.
- B. Chingaminum.
- C. Galochinum
- D. Primachinum.
- E. Amodiachinum.

9. Specify the drug which is used in amebiasis of any localization of pathological process.

- A. Chingaminum.
- B. Metronidazolium (Trichopolium).
- C. Emetini hydrochloridum.
- D. Chiniophonum.
- E. Tetracyclinum.

10. A woman addressed to a gynecologist in relation with large discharge from the vagina with unpleasant smell. After laboratory examination the diagnosis of trichomoniasis was made. What drug should be used in this situation?

- A. Metronidazolium (Trihopolum).
- B. Sulfadimezinum.
- C. Chingaminum.
- D. Chloridinum.
- E. Monomycinum.

11. A patient visited a physician with complaints of bowel dysfunction. After laboratory examination the diagnosis of lambliaiasis was made. Specify the drug that should be used.

- A. Monomycinum.
- B. Tetracyclinum.
- C. Trichomonacidum.
- D. Metronidazolium (Trichopolium).
- E. Chingaminum.

12. Patient addressed to a physician to get a drug for prevention of malaria.

Indicate the drug:

- A. Fenasalum.
- B. Clotrimazolum.
- C. Mebendazolum.
- D. Furazolidonum.
- E. Primaquinum.

13. What is the mechanism of anthelmintic action of levamisole?

- A. Oppression of succinate dehydrogenase, ATPase.
- B. Oppression of MAO.
- C. DNA synthesis damage.
- D. Cholinesterase activation.
- E. Oppression of N-acetyltransferase.

14. A drug is administered for prevention and treatment of malaria, treatment of amebiasis and diseases of connective tissue. Indicate the drug:

- A. Metronidazolum.
- B. Tetracyclinum.
- C. Chingaminum (chloroquine).
- D. Erythromycinum.
- E. Quininum.

15. A drug was administered to a patient with ascaridosis. It is known to have influence on immune system, and is used as immunological modulator.

Indicate the drug:

- A. Pyrantelum.
- B. Piperazinum.
- C. Levamisolum.
- D. Phenasalum.
- E. Praziquantelum.

16. A patient complaints of nausea, vomiting, loss of appetite. After investigation of stool ascaridosis was revealed. A drug with immune modulation activity was prescribed for single usage. Indicate the drug:

- A. Levamisolum.
- B. Mebendazolum.
- C. Pyrantelum.
- P. Naphtamonum.

E. Piperazinum.

P. W. 12.
Theme:
Antineoplastic Agents.

General question:

1. Classification of the Antineoplastic drugs
2. Mode of action
3. Pharmacodynamics of the Antimetabolites
4. Pharmacodynamics of the Alkylating agents
5. Antibiotics, hormones, enzymes employed for treatment of the cancer.
6. Cytostatic agents
7. Complications of the chemotherapy and its treatment
8. Radioisotope drugs
9. Radioprotector

Classification of the Antineoplastic Agents

1. Alkylating agents;
2. Antimetabolites;
3. Derivatives from natural products (Alkaloids);
4. Antibiotics;
5. Hormones and their antagonists;
6. Enzymes;
7. Immunomodulating factors and cellular growth factors;
8. Monoclonal antibodies
9. Drugs from embryonic tissues;
10. Other drugs.

Home task on prescription:

1. Mercaptopurinum in tablets
2. Myelosanum in tablets
3. Cyclophosphamidum in ampoules
4. Methotrexatum in ampoules
5. Vincristinum in ampoules

Educational research work:

Assignment 1.

Prescribe:

1. Methotrexatum in tablets

2. Dopanum in tablets
3. Colchaminum in anointment
4. Doxorubicini hydrochloridum in vials
5. Phosphoestrolum in ampoules
6. Asparaginasum in vials
7. Enterosgelum

Assignment 2.

Pharmaco-therapeutic tasks:

1. An antimetabolic drug antagonist of folic acid
2. An antimetabolic drug derivative of purine
3. Alkylating agents to treat chronic lymphatic leukaemia
4. Phytogenous cytostatics
5. Antineoplastic antibiotics
6. Antineoplastic animal drugs

Assignment 3.

Individual work: fill in the table.

Drugs	Dosage form	Indication to use

P. W. 13.

Theme:

Basic principles to the treatment of poisoning

General questions:

1. Toxicology of acute and chronic intoxication. General approach to the treatment of acute poisoning.
2. Measures directed to stop entering of poison into the organism.
3. The main strategies of inactivation of poison and acceleration of its excretion from the organism after oral introduction (using of adsorbents, astringents, covering, emetic and purgative agents).
4. Inactivation of poison being absorbed into the blood: antidotes and infusion therapy.
5. The strategies of acceleration of poison excretion from the blood (forced diuresis, hemodialysis, peritoneal dialysis).
6. Normalization of the basic physiological function (respiration, circulation) and symptomatic treatment.
7. Symptoms and specific medicinal antagonists in poisonings.

Home task on prescription:

1. Apomorphine hydrochloride in ampoules.
2. Carbo activatus in non-divided powder.
3. Sol. Ammonii caustici in flacons.
4. Unithiole in ampoules.
5. Mannite in flacons.
6. Adrenaline hydrochloride in ampoules.
7. Sol. Natrii chloride isotonicae in flacons.
8. Dipiroxime in ampoules.
9. Coffeine-natrii benzoas in ampoules.
10. Glucose in flacones.
- 11.

Educational research work

Assignment 1. Prescribe:

1. Alloxime in ampoules.
2. Magnesii sulfas in non-divided powder.
3. Nalorphine hydrochloride in ampoules.
4. Acide aminocapronice in flacones.
5. Tetacine-calcii in ampoules.
6. Polyglucine in flacons.

7. Natrii thiosulfas in ampoules.
8. Enterosgele.
9. Aethimizole in tablets and ampoules.

Assignment 2. *Pharmaco-therapeutic task:*

1. An antagonist of opioid analgesics for parenteral introduction.
2. An adsorbent used in poisonings.
3. An antidote in cardiac glycosides intoxication.
4. An emetic drug exiting the trigger-zone of the vomiting center.
5. An agent used in poisoning with M-cholinoblockers.
6. An agent used in poisonings with heavy and rare metals salts.
7. An antidote to direct anticoagulants.
8. The reactivators of acetylcholinesterase as antidote in organophosphate pesticide poisoning.

Assignment 3. *Individual work.*

Analyze the data of table “Antidotes to poisoning or overdose” and explain the mechanism of action of antidotes.

Assignment 4. Test of control of the knowledge:

1. A patient with chronic cardiovascular insufficiency during digitalization demonstrated the following symptoms: headache, fatigue, nausea, color vision impairment (surrounding objects are perceived in green color). On ECG the sinus bradycardia and signs of impairment of atrioventricular conductivity were detected. What can be prescribed to relieve the symptoms of intoxication?

- A. Dipiroximum.
- B. Naloxonum.
- C. Bemegridum.
- D. Unithiolum.
- E. Atropini sulfas.

2. A patient with mercury poisoning was delivered to a toxicological department from a chemical plant. What drug should be used in this situation?

- A. Izonitrozinum.
- B. Unithiolum.
- C. Naloxonum.

- D. Carbo activatus.
- E. Enterosgelum.

3. A patient had syphilis. He was treated with bismuth drugs. After that such complications as grey spots on the mucous tunic of the mouth and symptoms of nephropathy appeared. What drug should be used as an antidote in case of poisoning with bismuth drugs?

- A. Nalorphini hydrochloridum.
- B. Methylenum coureleum.
- C. Naloxonum.
- D. Bemegridum.
- E. Unithiolum.

4. A child poisoned with mushrooms, namely fly agarics, has been taken to a toxicological department. What drug should be used for emergency first of all?

- A. Dipiroxinum.
- B. Papaverini hydrochloridum.
- C. Unithiolum.
- D. Natrii thiosulfas.
- E. Atropini sulfas.

5. A child, 2 years old, has drunk eye drops from the domestic first-aid kit. The child's condition is poor, accompanied by transpiration and salivation, asthmatic breathing, cough, sharply miotic pupils, muffled heart sounds, bradycardia, low arterial pressure, intensive intestinal peristalsis, diarrhea. What drug has caused the poisoning?

- A. Pilocarpini hydrochloridum.
- B. Propranololum.
- C. Atropini sulfas.
- D. Platyphyllini hydrotartras.
- E. Sulfacylum-natrium.

6. Symptoms of dithyline overdose appeared during an operative intervention. What actions will be expedient to reduce the phenomena of overdose?

- A. Introduction of M-cholinergic antagonists.
- B. Introduction of anticholinesterase drugs.
- C. Introduction of ganglionic blockers.

- D. Transfusion of blood or plasma.
- E. Introduction of N-cholinergic antagonists.

7. A victim treated plants with an insecticidal solution without personal protection equipment. After a while, salivation, transpiration, tears secretion, pain in the stomach, and diarrhea began. Examination revealed miosis. What group does the substance, which has caused such symptoms, belong to?

- A. Organic compounds of phosphorus.
- B. N-Cholinomimetics.
- C. Copper salt.
- D. Nitrates.
- E. Organic compounds of chlorine.

8. A patient in the condition of acute circulatory collapse resulting from severe poisoning with unknown substance has been admitted to a hospital. Which drug should be used for the acute care?

- A. Propranololum.
- B. Naphthyzinum.
- C. Isadrinum.
- D. Salbutamololum.
- E. Mesatonum.

9. A patient with manifestations of acute poisoning with morphine has been taken to a resuscitation unit. What drug is it necessary to use as an antidote for gastric lavage?

- A. Kalii permanganas.
- B. Natrii hydrocarbonas.
- C. Furacilinum.
- D. Natrii chloridum.
- E. Acidum boricum.

10. In 2 — 3 hours after the parenteral introduction of a drug a patient became comatose. Cheyne — Stokes respiration was observed, pupils became abruptly miotic, the knee reflex was kept. What drug could lead to the poisoning?

- A. Diazepamum.
- B. Aminazinum.
- C. Morphini hydrochloridum.

- D. Spiritus aethylicus.
- E. Phenobarbitalum.

11. An unconscious patient has been taken to a hospital. His skin is cold, pupils are miotic, breathing is complicated (Cheyne —Stokes type), arterial pressure is low, the urinary bladder is overfilled. The diagnosis is poisoning with morphine. What drug is it necessary to give as an antidote?

- A. Natrii thiosulfas.
- B. Bemegridum.
- C. Cytitonum.
- D. Unithiolum.
- E. Naloxonum.

12. An emergency team has taken to a reception ward a patient demonstrating drowsiness, cyanosis, infrequent cogged-wheel breathing, sharply miotic pupils. Knee reflexes are kept. The traces of injections are revealed on his arms. What drug causes poisoning characterized by the above-mentioned symptoms?

- A. Proserinum.
- B. Atropini sulfas.
- C. Morphini hydrochloridum.
- D. Phenobarbitalum.
- E. Aminazinum.

13. A 25-year-old woman is hospitalized with signs of acute poisoning with morphine. What antidote is necessary to be given to the patient?

- A. Atropini sulfas.
- B. Unithiolum.
- C. Naloxonum.
- D. Lobelini hydrochloridum.
- E. Aethimizolum.

14. A patient with poisoning with morphine has been delivered to a hospital. It is known that in case of acute poisoning with morphine a specific antagonist naloxone is used. What factor provides the development of antagonistic action?

- A. Competition for binding with opiate receptors.
- B. Direct excitation of the respiratory center.
- C. Reflex excitation of the respiratory center.

- D. Sharp acceleration of morphine metabolism.
- E. Decrease of sensitivity of the organism to morphine.

15. A 38 year-old patient was admitted to a hospital due to acute poisoning with mercury dichloride. Indicate the antidote which should be introduced to the patient immediately.

- A. Unithiolum.
- B. Pipyroximum.
- C. Atropini sulfas.
- D. Nalorphinum.
- E. Isonitrosinum.

16. A patient was admitted to a hospital by the ambulance due to acute poisoning with morphine. Indicate the agent which is used for gastric lavage in this situation.

- A. Kalii permanganas.
- B. Natrii hydrocarbonas.
- C. Furacilinum.
- D. Tanninum.
- E. Acidum boricum.

17. A patient after drinking unknown liquid was admitted to a hospital with complaints of stomachache, pain in gullet and diarrhea with little amount of blood. On examination hyperemia of throat mucous membranes, gums' bleeding, lymphatic nodes enlargement and metallic aftertaste were revealed. Within 2-3 days renal insufficiency was developed. Determine the agent which caused named above symptoms:

- A. Salts of heavy metals.
- B. Furacilinum.
- C. Spiritus aethylicus.
- D. Acidum boricum.
- E. Atropini sulfas.

18. After treatment with bismuth preparation, a patient with syphilis developed symptoms of kidney insufficiency and gray strains on mouth mucous membranes. Indicate a drug a doctor has to use as specific antidote in the case:

- A. Nalorphinum.
- B. Bemegridum.

C. Unithiolum.

P. Naloxonum.

E. Methylenum coeruleum.