



THE MINISTRY OF SCIENCE AND HIGHER EDUCATION OF RUSSIAN FEDERATION  
Federal state autonomous educational institution  
of higher education  
**FAR EASTERN FEDERAL UNIVERSITY**  
(FEFU)

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**SCHOOL OF MEDICINE**

" AGREED BY"

«General medicine» educational program  
Supervising person

(signature)

V.V. Usov

(FULL NAME.)



" APPROVED BY"

Clinical Medicine  
Department Director

(signature)

T.A. Brodskaya

(FULL NAME.)

" 13 » December 2021

" 13 » December 2021

**WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)**

Clinical pharmacology

Specialty 31.05.01 «General medicine»

**Form of study: full time**

year 6, semesters 12  
lectures 18 hours.  
practical classes 52 hours.  
laboratory works are not provided  
total amount of in-class lessons 70 hours  
independent self-work 74 hours  
control works (quantity) are not provided  
course work / course project not provided  
pass-fail exam with credit 6 year, C semester  
exam not provided

The working program was drawn up in accordance with the requirements of the federal state educational standard of higher education 31.05.01 in the direction of training "General Medicine" (level of training specialist), approved by order of the Ministry of Science and Higher Education of the Russian Federation dated August 12, 2020 No. 988 and the Educational Plan in the direction of training "General Medicine".

The working program of the discipline was discussed at the meeting of the Department of the clinical medicine. Protocol No.4, 13 December 2021

Director of the Department of Clinical Medicine: Dr of science, professor Brodskaya T.A..

Prepared by: Associate Professor Makarova K.E., Senior lecturer V.A. Ereemeeva

Vladivostok  
2022

**Reverse side of the title page of the WPAD**

**I. The work program was revised at the meeting of the Department:**

Protocol dated "\_\_\_\_\_" \_\_\_\_\_ 20\_\_ No. \_\_\_\_\_

Department Director \_\_\_\_\_  
(signature) (Full Name)

**II. The work program was revised at the meeting of the Department:**

Protocol dated "\_\_\_\_\_" \_\_\_\_\_ 20\_\_ No. \_\_\_\_\_

Department Director \_\_\_\_\_  
(signature) (Full Name)

**III. The work program was revised at the meeting of the Department:**

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(signature) (Full Name)

**IV. The work program was revised at the meeting of the Department:**

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**V. The work program was revised at the meeting of the Department:**

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## ANNOTATION

The discipline "Clinical pharmacology" is designed for students studying on the educational program of higher education 31.05.01 "General medicine", implemented on the 6th year in the C semester. The total educational requirement of the discipline is 144 hours, 4 credit units

### **THE GOALS AND OBJECTIVES OF DISCIPLINE:**

**The goals:** development of competencies in clinical pharmacology, skills and skills in selection of rational pharmacotherapy taking into account knowledge of pharmacodynamics, pharmacokinetics, interaction of drugs, undesirable drug reactions and principles of evidence-based medicine for effective, safe and rational pharmacotherapy.

### **Discipline objectives:**

- formation of knowledge on the main issues of clinical pharmacology (pharmacodynamics, pharmacokinetics, pharmacogenetics, drug interactions, undesirable drug reactions, pharmacoeconomics, pharmacoepidemiology);
- formation of ideas about sections of clinical pharmacology that regulate rational choice of drugs: evaluation of effectiveness and safety, drug form, pharmacoeconomics, pharmacoepidemiology;
- to consolidate knowledge in the field of general and private clinical pharmacology in the light of the latest achievements of basic and clinical medicine, as well as pharmacotherapy from the perspective of evidence-based medicine;
- to form the concept of the use of various groups of drugs for diseases of internal organs and emergency conditions; their change in case of malfunction of various organs and systems; interactions with other drugs; undesirable drug reactions; indications and contraindications to the use of drugs; results of meaningful randomized controlled drug trials;
- developing skills to study scientific literature and official statistical reviews;
- knowledge of the basis of legislation in the field of drug circulation.

To successfully study the discipline of "Clinical Pharmacology," trainees should have the following preliminary competencies:

- knowledge of basic knowledge in anatomy, physiology, physics, chemistry
- knowledge of the etiology, pathogenesis and clinic of socially significant diseases
- obeying ethics and deontology in communication with patients

**As a result of studying this discipline, students form the following universal competencies:**

Type of task	Code and name of universal competence (resultofdevelopment)	Name of the assessment indicator (the result of training in the discipline)
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Type of task	Code and name of universal competence (resultofdevelopment)	Name of the assessment indicator (the result of training in the discipline)
medical	UC-6 Capable of developing a treatment plan for a disease or condition taking into account the diagnosis, age and clinical picture in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care taking into account the standards of medical care	UC-6.1 Knows modern methods of using drugs, medical devices and therapeutic nutrition for diseases and conditions in the patient in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care
		UC-6.3 Is able to make the plan of treatment of a disease and the patient's fortune taking into account the diagnosis, age of the patient, a clinical picture of a disease according to the operating orders of delivery of health care, clinical recommendations (protocols of treatment) concerning delivery of health care taking into account standards of medical care
	UC-7 Ready for prescribing medicines, medical devices and therapeutic nutrition, taking into account the diagnosis, age and clinical picture of the disease and in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care	UC-7.1 Knows the mechanism of action of medicines, medical devices and medical nutrition, medical indications and contraindications to their use; complications caused by their use
	UC-9 Capable of assessing the effectiveness and safety of the use of medicines, medical devices, therapeutic nutrition and other methods of treatment	UC-9.1 Knows the mechanism of action of non-drug treatment; medical indications and contraindications to his appointment; side effects, complications caused by its use
		UC-9.2 Evaluates the effectiveness and safety of medicines, medical products and therapeutic nutrition
	UC-10 Ready to organize personalized treatment of patient, including pregnant women, elderly and senile patients, evaluation of effectiveness and safety of treatment	UC-10.2 Able to prescribe personalized treatment for patients depending on constitutional type, age, comorbidities and changes related to pregnancy, taking into account standards of care

Code and name of the indicator of achievement of competence	Name of the assessment indicator (the result of training in the discipline)
UC-6.1 Knows modern methods of using drugs, medical devices and therapeutic nutrition for diseases and conditions in the patient in accordance with the current procedures for providing medical care, clinical	Knows the modern methods of using drugs, medical devices and therapeutic nutrition for diseases and conditions in the patient in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care

Code and name of the indicator of achievement of competence	Name of the assessment indicator (the result of training in the discipline)
recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care	Able to draw up a plan for the treatment of the disease and the condition of the patient, taking into account the diagnosis, the age of the patient, the clinical picture of the disease in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care
	Has the skills to draw up a treatment plan for a disease or condition taking into account the diagnosis, age and clinical picture in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on the provision of medical care taking into account the standards of medical care
UC-6.3 Is able to make the plan of treatment of a disease and the patient's fortune taking into account the diagnosis, age of the patient, a clinical picture of a disease according to the operating orders of delivery of health care, clinical recommendations (protocols of treatment) concerning delivery of health care taking into account standards of medical care	Knows the modern methods of using drugs, medical devices and therapeutic nutrition for diseases and conditions in the patient in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care
	Able to draw up a plan for the treatment of the disease and the condition of the patient, taking into account the diagnosis, the age of the patient, the clinical picture of the disease in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care
	Has the skills to draw up a treatment plan for a disease or condition taking into account the diagnosis, age and clinical picture in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on the provision of medical care taking into account the standards of medical care
UC-7.1 Knows the mechanism of action of medicines, medical devices and medical nutrition, medical indications and contraindications to their use; complications caused by their use	Knows the mechanism of action of drugs
	Able to determine the list of groups of drugs for the treatment of a certain nosological form
	Has skills in prescribing a specific drug in various pathological conditions of the patient
UC-9.1 Knows the mechanism of action of non-drug treatment; medical indications and contraindications to his appointment; side effects, complications caused by its use	He knows modern methods of non-drug treatment of diseases and conditions in the patient in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care; mechanism of action of non-drug treatment; medical indications and contraindications to his appointment; side effects, complications caused by its use
	Able to prescribe non-drug treatment taking into account the diagnosis, age and clinical picture of the disease in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care taking into account the standards of medical care
	He has the skills to prescribe non-medical treatment taking into account the diagnosis, age and clinical picture of the disease in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care taking into account the standards of medical care
UC-9.2 Evaluates the effectiveness and	Knows the signs of effectiveness and safety of the use of drugs,

Code and name of the indicator of achievement of competence	Name of the assessment indicator (the result of training in the discipline)
safety of medicines, medical products and therapeutic nutrition	medical devices, medical nutrition and other methods of treatment
	Able to assess the effectiveness and safety of the use of drugs, medical devices and medical nutrition
	Has skills in assessing the effectiveness and safety of the use of drugs, medical devices and medical nutrition
UC-10.2 Able to prescribe personalized treatment for patients depending on constitutional type, age, comorbidities and changes related to pregnancy, taking into account standards of care	Knows the peculiarities of treatment of elderly and senile patients, pregnant women
	Knows how to prescribe treatment to elderly and senile patients pregnant with women
	He has the skills to prescribe treatment to a patient of senile and elderly age, pregnant woman, evaluate the effectiveness and safety of the prescribed treatment

**2. The complexity of the discipline and types of training sessions in the discipline**

The total labor intensity of the discipline is 4 credit units (144 academic hours).(1 credit unit corresponds to 36 academic hours)

**The types of training sessions and work of the student in the discipline are:**

Designation	Types of training sessions and work of the student
Lec	Lectures
PC	Practicalclasses
SW	Self-preparation
Control	Independent work of the student and contact work of the student with the teacher during the period of intermediate certification

**Discipline structure:**

**Full-time form of education.**

№	Name of the discipline section	Semester	Number of hours by type of training sessions and work of the student						Forms of intermediate certification, current monitoring of progress
			Lec	Lab	Pr	On-line	IW	Control	
1	Module 1. General issues of clinical pharmacology.	12	4	-	10	6	38	36	OQ-1; OQ -3; WW-1; WW -4; WW -11; WW -14
2	Module 2 Specific Clinical Pharmacology Issues	12	14	-	42	30			
Total			18	-	52	36	38	36	

## **I. STRUCTURE AND CONTENT OF THEORETICAL PART OF COURSE**

### **Lectures (18 hours)**

#### **Module I. General issues of clinical pharmacology (4 hours)**

##### **Topic 1. Subject of clinical pharmacology. Content of terms and concepts. Sections of clinical pharmacology. Drug interactions. (2 hours)**

Clinical pharmacology - content, main tasks and subject of study. The relationship of discipline with other sciences. Main stages of development of clinical pharmacology. Content of basic terms and concepts. Types of drug interactions.

##### **Topic 2. Fundamentals of rational pharmacotherapy. Undesirable adverse drug reactions (2 hours)**

Types of pharmacotherapy. Goals and objectives of rational pharmacotherapy. Drug selection and dosing regimen. Monitoring the effectiveness and safety of therapy. Patient adherence to treatment. Diagnosis, prevention and treatment of undesirable adverse reactions

#### **Module 2. Particular clinical pharmacology issues (14 hours)**

##### **Topic 3. Particular clinical pharmacology issues. Clinical pharmacology of drugs used to treat arterial hypertension (2 hours)**

Arterial hypertension as the most important risk factor for major cardiovascular diseases. Etiology, pathogenesis and risk factors for disease development. Clinical-pharmacological approaches to treatment. The main groups of drugs used to treat arterial hypertension. Control of effectiveness and safety of therapy

##### **Topic 4. Particular clinical pharmacology issues. Clinical pharmacology of drugs used in coronary heart disease (CHD) (2 hours)**

Definition, epidemiology, etiology and pathogenesis of CHD. Clinical manifestations of the disease. Clinical-pharmacological approaches to treatment. Classification of medicines. Control of effectiveness and safety of therapy

##### **Topic 5. Particular clinical pharmacology issues. Clinical pharmacology of drugs affecting bronchial patency (2 hours)**

The main pathogenetic mechanisms for the development of bronchial asthma (BA), pathways of influence on various links of pathogenesis; classification and properties of the main classes of bronchodilators and preparations of basic bronchial asthma therapy.

##### **Topic 6. Particular clinical pharmacology issues. Clinical pharmacology of**

### **diuretics (2 hours)**

Structure of the nephron, localization and mechanism of action of diuretics. Classification of drugs. Principles of rational treatment and diuretic choice. Control of efficacy and safety of therapy.

### **Topic 7. Particular clinical pharmacology issues. Clinical pharmacology of glucocorticoids and nonsteroidal anti-inflammatory drugs (2 hours)**

Arachidonic acid metabolism. Mechanism of action of NSAIDs and GCSs. Indications for prescribing drugs. Undesirable drug reactions and methods of preventing them.

### **Topic 8. Particular clinical pharmacology issues. Clinical pharmacology of psychotropic drugs (2 hours)**

Pharmacotherapy of mental disorders. Choice of drugs depending on the presence and severity of symptoms of the disease. Control of efficacy and safety of therapy.

### **Topic 9. Particular clinical pharmacology issues. Clinical pharmacology of antimicrobial drugs. Basic principles of rational antibacterial therapy (2 hours)**

Types of infection and symptoms of the infectious process. Types of antibacterial therapy. Classification of antibacterial drugs, basic mechanisms of antibiotic resistance of bacteria. Pharmacokinetics and pharmacodynamics of antibacterial drugs. Control of efficacy and safety of antibacterial therapy.

## **II. STRUCTURE AND CONTENT OF PRACTICAL PART OF COURSE AND INDEPENDENT WORK**

### **Practical classes (52 hour)**

#### **Lesson 1. Subject of clinical pharmacology. Content of terms and concepts.**

#### **Sections of clinical pharmacology. Clinical pharmacokinetics.**

#### **Pharmacodynamics (2 hours)**

1. Definition, subject and objectives of clinical pharmacology, relationship with other disciplines.
2. Main sections of clinical pharmacology.
3. Absorption of drugs. Factors affecting suction
4. Distribution of drugs in the body. Association with blood plasma proteins. Penetration through histohematic barriers
5. Metabolism of drugs. Biotransformation phases.
6. Removal of drugs from the body.
7. Basic pharmacokinetic parameters
8. Pharmacodynamics.



9. Types of drug interactions.

**Lesson 2. Fundamentals of rational pharmacotherapy. Undesirable adverse reactions when using drugs. (4 hours)**

1. Types of pharmacotherapy. Goals, objectives and basic principles of rational pharmacotherapy.
2. Drug selection and dosing regimen.
3. Monitoring the effectiveness and safety of therapy.
4. Patient adherence to treatment. Diagnosis, prevention and treatment of unwanted adverse reactions
5. Features of long-term pharmacotherapy
6. Drug withdrawal.
7. Combined use of drugs.
8. Terminology of side effects of drugs.
9. Classification of undesirable drug reactions.
10. Risk factors for undesirable drug reactions.
11. Diagnosis, treatment and prevention of unwanted drug reactions.
12. Rules for notifying supervisory authorities of the occurrence of unwanted drug reactions.

**Lesson 3. Evidence-based medicine. Pharmacoeconomic research methods in medicine. Clinical studies of drugs. (4 hours)**

Open conversation (6 hours)

1. Evidence-based medicine.
2. Pharmacoeconomics. Types of pharmacoeconomic analysis.
3. Clinical studies of drugs.
4. Phases of clinical research
5. Ethical aspects of clinical research
6. Procedure for registration of new medicines

**Lesson 4. Clinical pharmacology of drugs for general anesthesia, local anesthetics, and myorelaxants. (4 hours)**

1. Definition of anesthesia. Classification of general anesthetics.
2. Clinical pharmacology of inhalation anesthesia agents
3. Clinical pharmacology of non-inhalation anesthesia agents
4. Combined anesthesia.
5. Use of anesthesia agents with drugs of other pharmacological groups.  
Premedikation
6. Local anesthetics. Mechanism of action. Chemical structure.
7. Types of local anesthesia. Classification of drugs from the point of view of practical application.
8. Requirements for local anesthetics.
9. Side effects of local anesthetics and ways to correct them
10. Clinical pharmacology of myorelaxants. Classification of drugs.
11. Mechanism of action, indications for use, side effects.

### Lesson 5. Clinical pharmacology of psychotropic drugs. (4 hours)

1. Pharmacotherapy of mental disorders
2. Clinical pharmacology of antipsychotic drugs (neuroleptics). Classification. Pharmacodynamics. Indications for use. Undesirable drug reactions.
3. Clinical pharmacology of anxiolytics. Classification. Mechanism of action. Major pharmacological effects. Indications for use. Undesirable drug reactions.
4. Sleep disorders. Clinical pharmacology of sleeping pills. Mechanism of action. Requirements for sleeping pills. Indications for use. Undesirable drug reactions.

### **Lesson 6. Pharmacotherapy of pain syndrome. (4 hours)**

#### Disput (6 hours)

1. Definition of pain. The main causes of pain syndrome.
2. The main groups of drugs used as painkillers.
3. Chronic pain syndrome. Patient management tactics. Monitoring the effectiveness and safety of therapy. Features of long-term prescription of drugs.
4. Clinical pharmacology of narcotic analgesics. Characteristics of essential drugs
5. Addictive. Drug addiction. Acute poisoning with narcotic analgesics.
6. Clinical pharmacology of nonnarcotic analgesics.
7. Arachidonic acid metabolism. Mechanism of action of drugs. Major pharmacological effects.
8. Characteristics of essential drugs.
9. Undesirable adverse reactions. Control measures for long-term use.

### **Lesson 7. Clinical pharmacology of drugs for the treatment of arterial hypertension (4 hours)**

1. Determination of arterial hypertension. Etiology, pathogenesis and risk factors for disease
2. Clinical and pharmacological approaches to treatment
3. Major groups of antihypertensive drugs. Combination antihypertensive therapy. Control of treatment efficacy and safety.
4. Clinical pharmacology of angiotensin converting enzyme inhibitors. Classification. Pharmacokinetics, pharmacodynamics. Indications for use. Undesirable adverse reactions. Control of treatment efficacy and safety.
5. Clinical pharmacology of angiotensin II receptor blockers Characterization of essential drugs.
6. Clinical pharmacology of  $\beta$ -blockers. Mechanism of action. Indications for use. Criteria for efficacy and safety of therapy. Characteristics of essential drugs.
7. Clinical pharmacology of slow channel calcium blockers. Classification. Pharmacokinetics, pharmacodynamics. Indications for use. Undesirable adverse reactions. Control of treatment efficacy and safety.
8. Use of diuretics for the treatment of arterial hypertension. Mechanism of action. Classification. Undesirable adverse reactions. Control of treatment efficacy and safety.
9. Hypertensive crisis. First aid in hypertensive crisis.

### **Lesson 8. Clinical pharmacology of antiarrhythmic drugs. (4 hours)**

ALM- Press Conference (6 hours)

1. Electrical properties of heart cells
2. Mechanisms for the development of arrhythmias
3. Clinical manifestations and diagnostic methods
4. Basic principles of treating arrhythmias
5. General characterization and classification of antiarrhythmic drugs
6. Clinical pharmacology of class IA antiarrhythmic drugs
7. Clinical pharmacology of class IB antiarrhythmic drugs
8. Clinical pharmacology of class IC antiarrhythmic drugs
9. Clinical pharmacology of class II antiarrhythmic drugs ( $\beta$ -blockers)
10. Clinical pharmacology of class III antiarrhythmic drugs (repolarization inhibitors)
11. Clinical pharmacology of class IV antiarrhythmic drugs (slow calcium channel blockers)

### **Lesson 9. Pharmacotherapy of chronic heart failure (4 hours)**

1. General perceptions of chronic heart failure
2. Clinical and pharmacological approaches to drug selection
3. Clinical pharmacology of ACE inhibitors
4. Cardiac glycosides in the treatment of chronic heart failure
5. Clinical pharmacology of  $\beta$ -blockers
6. Diuretics in the Treatment of Heart Failure
7. Angiotensin II receptor blockers in the treatment of chronic heart failure.

### **Class 10. Clinical pharmacology of drugs affecting the hemostasis system (2 hours)**

1. Hemostasis system.
2. Clinical and pharmacological approaches to the treatment of thrombosis
3. Control of treatment effectiveness and safety
4. Clinical pharmacology of antiplatelets
5. Clinical pharmacology of direct action anticoagulants
6. Clinical pharmacology of indirect action anticoagulants
7. Clinical pharmacology of thrombolytic agents

### **Lesson 11. Clinical pharmacology of glucocorticosteroid drugs (GCS) and non-steroidal anti-inflammatory agents (NSAID) (2 hours)**

1. Classification and mechanism of action of SCS.
2. Main pharmacodynamic effects of GCS
3. Indications and contraindications to the purpose of the GCS
4. Method of use, dosing regimen, undesirable side reactions of GCS
5. Nonsteroidal anti-inflammatory agents (NSAID). Classification. Mechanism of action.
6. Major pharmacological effects. Indications for use. Undesirable adverse reactions
7. NSAID selection tactics, evaluation of treatment efficacy and safety

**Class 12. Clinical pharmacology of drugs used in bronchial asthma (AD)  
(2 hours)**

1. Main directions of AD treatment. Drug groups. Principles of stepwise treatment of the disease.

2. Clinical and pharmacological characterization of  $\beta$ -adrenomimetics. Classification. B 2-agonists short and long acting. Place in treatment. Undesirable adverse reactions

3. Selective inhalation anticholinergics. Pharmacodynamics. Place in the treatment of the disease. Undesirable adverse reactions.

4. Methylxanthins. Mechanism of action. Factors affecting the pharmacokinetics of methylxanthins.

5. Inhaled glucocorticoids (ICG). Clinical and pharmacological characterization of drugs. Place in treatment. Use, undesirable side reactions.

6. Anti-leukotriene drugs. Mechanism of action. Undesirable adverse reactions. Drug interactions.

7. Mast cell membrane stabilizers. Mechanism of action. Characterization of individual drugs.

**Lesson 13. Clinical pharmacology of agents for treating gastric and duodenal ulcer. (4 hours)**

ALM- Open conversation (6 hours)

1. Main drug groups

2. Clinical and pharmacological approaches to drug selection in the treatment of ulcer disease

3. Anthelico bacter therapy

4. Clinical pharmacology of acid-peptic factor-reducing drugs:

- clinical pharmacology of antacids

- clinical pharmacology of M1- cholinoblockers

- clinical pharmacology of H2 receptor blockers

- clinical pharmacology of proton pump inhibitors

- clinical pharmacology of gastroprotective drugs

- clinical pharmacology of alginates

**Lesson 14. Clinical pharmacology of sugar-lowering drugs. (4 hours)**

ALM- Open conversation (6 hours)

1. Insulin. Mechanism of action and major pharmacological effects

2. Classification. Clinical pharmacology of insulin preparations

3. Clinical and pharmacological approaches to the treatment of type I diabetes mellitus

4. Method of use and insulin dosing regimen

5. Clinical and pharmacological approaches to the treatment of type II diabetes mellitus

6. Oral sugar-lowering drugs. Classification

7. Clinical pharmacology of sulfonylurea derivatives preparations

8. Clinical pharmacology of biguanides

9. Clinical pharmacology of insulin release stimulants

10. Insulin Sensitisers

11. A-glycosidase inhibitors

### **Lesson 15. Clinical pharmacology of antimicrobials. (4 hours)**

ALM- Open conversation (6 hours)

1. Types of infections and symptoms of the infectious process. Nosocomial infection concept.
2. Types of antibacterial therapy. General principles for the use of antibacterial drugs.
3. Pharmacokinetics and pharmacodynamics of antibacterial drugs.
4. Control of efficacy and safety of therapy.
5. Classification of antibacterial drugs. Clinical pharmacology of  $\beta$ -lactam antibiotics.
6. Clinical pharmacology of aminoglycosides. Spectrum of activity. Dosing mode. Undesirable adverse reactions. Application safety monitoring.
7. Clinical pharmacology of glycopeptides.
8. Clinical pharmacology of macrolides. Spectrum of activity. Indications for use. Undesirable adverse reactions. Drug interactions.
9. Clinical pharmacology of glycosamides, tetracyclines, chloramphenicol. Spectrum of activity. Indications for use. Undesirable adverse reactions.

### **III. EDUCATIONAL AND METHODOLOGICAL SUPPORT FOR STUDENTS' INDEPENDENT WORK**

-Scholastic-methodical provisioning for the students' individual work in the discipline pathological anatomy presented in supplement 1 and includes:

- schedule for performing individual work in the discipline, including the approximate time to allocate on each task;
- description of the tasks for individual work of students and methodical recommendations for their completion;
- requirements for submission and registration of results of individual work.

<b>№</b>	<b>Date/Duedates</b>	<b>Typeofindependentwork</b>	<b>Estimated time to complete (hour)</b>	<b>Formofcontrol</b>
1	2-18 weeks	Filling the notice of undesirable reaction or lack of therapeutic effect of the drug	22 hours	OQ-1 Interview
2	6-10 weeks	Presentation on the topic of	8 hours	OQ -3 Report, information on

		the lesson		topic
3	10-16 weeks	Paper	8hours	WW-4 abstract
4	16-18 weeks	Preparationfortheexam	36 hours	OQ -1 Interview WW-1 Test
Totally:			74 hours	

### **Recommendations for independent work of students**

Planning and organization of time allotted for execution of tasks of independent work.

Having studied the schedule of independent work, it should be correctly organized. It is recommended to study the structure of each task, pay attention to the work schedule, reporting on each task is provided in the last week according to the schedule. Note that the results of independent work affect the final assessment based on the results of the development of the training discipline.

Working with literature.

When performing a number of tasks, you need to work with literature. It is recommended to use various opportunities for working with literature: the funds of the FEFU scientific library (<http://www.dvfu.ru/library/>) and other leading universities in the country, as well as available for using scientific library systems.

In the process of performing independent work, including when writing a report, it is recommended to work with the following types of publications:

a) Scientific publications intended for scientific work and containing theoretical, experimental information about research. They can be published in the form of: monographs, scientific articles in journals or in scientific collections;

b) Educational literature is divided into:

- educational editions (textbooks, manuals, texts of lectures) which contain the fullest system statement of discipline or its some section;

- directories, dictionaries and encyclopedias - editions containing short information of a scientific or applied nature, not intended for continuous reading. Their goal is to quickly get the most general ideas about the subject.

There are two methods of working on sources:

- continuous reading is mandatory when studying a textbook, chapters of a monograph or article, that is, what has educational significance. As a rule, it requires re-reading in order to understand what is written. Try not to skip comments, footnotes, reference materials when reading in a continuous way, as they are intended for explanation and assistance. Analyze pictures (maps, charts, graphs), try to understand what trends and patterns they reflect;

- The selective reading method complements the continuous reading; it is used to search for additional, clarifying the necessary information in dictionaries, encyclopedias, and other reference publications. This method is extremely important for repeating the studied and consolidating it, especially in preparation for the test or exam.

In order for each method to bring the greatest effect, it is necessary to record all important points related to the topic of interest to you.

Theses are the main provisions of scientific work, an article or other work, and possibly an oral speech; they carry more information than the plan. Simple theses are concise in form; complex - in addition to the main author's thought, they contain a brief justification and evidence that give the theses a more weighty and convincing character. The theses of the read allow you to more deeply disclose its content; learning to state the essence of what you read in the thesis form, you will be able to distinguish the most important and valuable from the many thoughts of the authors and make generalizations.

A conspiracy is a way to put the contents of a book or article in a logical sequence. By inspecting any source, we must strive to say a lot in a few words. In the text of the concept, it is desirable to place not only conclusions or provisions, but also their reasoned evidence (facts, figures, quotes).

You can also write a conception as you study the work, for example, if you are working on a monograph or several journal articles.

When compiling theses or abstracts, always make links to pages from which you have taken the position or fact to be inspected - this will help you reduce the time to find the right place in the book if there is a need to better understand the question or clarify something when writing written works.

#### **Methodological recommendations for writing and designing an abstract**

An abstract is a student's creative activity, which reproduces in its structure research activities to solve theoretical and applied problems in a certain branch of scientific knowledge. Because of this, term paper is the most important component of the educational process in higher education.

The abstract, being a model of scientific research, is an independent work in which the student solves a problem of a theoretical or practical nature, applying the scientific principles and methods of this branch of scientific knowledge. The result of this scientific search may have not only subjective, but also objective scientific novelty, and therefore can be presented for discussion by the scientific community in the form of a scientific report or message at a scientific and practical conference, as well as in the form of a scientific article.

The abstract involves the acquisition of skills in building business cooperation based on ethical standards for the implementation of scientific activities. Purposefulness, initiative, disinterested cognitive interest, responsibility for the results of one's actions, conscientiousness, competence are personality traits that characterize the subject of research activities that correspond to the ideals and norms of modern science.

An abstract is an independent educational and research activity of a student. The teacher provides advisory assistance and evaluates the process and results of the activity. He provides an approximate topic for abstracts, clarifies the problem and the topic of research together with the intern, helps to plan and organize research activities, appoints the time and minimum number of consultations.

The teacher accepts the text of the abstract for verification at least ten days before the defense.

Traditionally, a certain structure of the abstract has developed, the main elements of which, in the order of their location, are the following:

1. Title page.
2. Task.
3. Table of contents.
4. List of symbols, symbols and terms (if necessary).
5. Introduction.
6. The main part.
7. Conclusion.
8. Bibliographic list.
9. Applications.

The title page indicates: educational institution, graduating department, author, teacher, research topic, place and year of the abstract.

The title of the abstract should be as short as possible and fully correspond to its content.

The table of contents (content) reflects the names of the structural parts of the abstract and the pages on which they are located. It is advisable to place the table of contents at the beginning of work on one page.

The presence of a detailed introduction is a mandatory requirement for the abstract. Despite the small volume of this structural part, its writing causes considerable difficulties. However, it is a well-executed introduction that is the key to understanding the entire work and testifies to the professionalism of the author.

Thus, the introduction is a very important part of the abstract. The introduction should begin with a rationale for the relevance of the chosen topic. When applied to the abstract, the concept of "relevance" has one feature. From how the author of the abstract knows how to choose a topic and how correctly he understands and evaluates this topic from the point of view of modernity and social significance, characterizes his scientific maturity and professional readiness.

In addition, in the introduction it is necessary to isolate the methodological basis of the abstract, to name the authors whose works formed the theoretical basis of the study. A review of the literature on the topic should show the author's thorough acquaintance with specialized literature, his ability to systematize sources, critically examine them, highlight the essential, determine the main thing in the current state of study of the topic.

The introduction reflects the significance and relevance of the chosen topic, defines the object and subject, purpose and objectives, and the chronological framework of the study.

The introduction ends with a statement of general conclusions about the scientific and practical significance of the topic, the degree of its study and availability of sources, and the formulation of a hypothesis.

In the main part, the essence of the problem is stated, the topic is revealed, the author's position is determined, factual material is given as an argument and for



illustrations of the put forward provisions. The author needs to show the ability to consistently present the material while simultaneously analyzing it. Preference is given to the main facts, rather than small details.

The abstract ends with the final part, which is called the “conclusion”. Like any conclusion, this part of the abstract plays the role of a conclusion determined by the logic of the study, which is in the form of a synthesis of the scientific information accumulated in the main part. This synthesis is a consistent, logically coherent presentation of the results obtained and their relationship with the general goal and specific tasks set and formulated in the introduction. It is here that the so-called "inferential" knowledge is contained, which is new in relation to the original knowledge. The conclusion may include suggestions of a practical nature, thereby increasing the value of theoretical materials.

So, in the conclusion of the abstract should be: a) the conclusions on the results of the study are presented; b) theoretical and practical significance, novelty of the abstract; c) the possibility of applying the results of the study is indicated.

After the conclusion, it is customary to place a bibliographic list of used literature. This list is one of the essential parts of the abstract and reflects the independent creative work of the author of the abstract.

The list of sources used is placed at the end of the work. It is issued either in alphabetical order (by the author's last name or book title), or in the order in which references appear in the text of the written work. In all cases, the full title of the work, the names of the authors or the editor of the publication, if a team of authors participated in writing the book, data on the number of volumes, the name of the city and publishing house in which the work was published, the year of publication, the number of pages are indicated.

### **Methodological recommendations for preparing of presentations**

To prepare a presentation, it is recommended to use: PowerPoint, MS Word, Acrobat Reader, LaTeX beamer package. The simplest presentation program is Microsoft PowerPoint.

To prepare the presentation, it is necessary to process the information collected when writing the abstract.

The sequence of preparation of the presentation:

1. Clearly state the purpose of the presentation.
2. Determine what will be the format of the presentation: live performance (then how long will it be) or email (what will be the context of the presentation).
3. Select all the content for the presentation and build a logical chain of presentation.
4. Identify key points in the content of the text and highlight them.
5. Determine the types of visualization (pictures) to display them on slides in accordance with the logic, purpose and specifics of the material.
6. Choose the design and format the slides (the number of pictures and text, their location, color and size).
7. Check the visual perception of the presentation.

Visualization types include illustrations, images, diagrams, tables. An

illustration is a representation of a real-life visual range. Images, unlike illustrations, are metaphors. Their purpose is to evoke emotion and create an attitude towards it, to influence the audience. With the help of well-thought-out and presented images, information can remain in a person's memory for a long time. Diagram - visualization of quantitative and qualitative relationships. They are used to convincingly demonstrate data, for spatial reasoning in addition to logical reasoning. A table is a concrete, visual and accurate display of data. Its main purpose is to structure information, which sometimes makes it easier for the audience to perceive the data

#### *Practical Tips for Preparing a Presentation*

printed text + slides + handouts are prepared separately;

slides - visual presentation of information, which should contain a minimum of text, a maximum of images that carry a semantic load, look clear and simple;

textual content of the presentation - oral speech or reading, which should include arguments, facts, evidence and emotions;

recommended number of slides 17-22;

obligatory information for the presentation: topic, surname and initials of the speaker; message plan; brief conclusions from what has been said; list of sources used;

handouts – should provide the same depth and scope as a live performance: people trust what they can carry with them more than disappearing images, words and slides are forgotten, and handouts remain a constant tangible reminder; it is important to hand out handouts at the end of the presentation; handouts should be different from slides, should be more informative.

#### **Guidelines for preparing for practical exercises**

Control of results of independent work is exercised during a practical training, oral polls, interviews, the solution of situational tasks, examinations, including by testing.

1. The student should prepare for the practical lesson: repeat the lecture material, read the desired section on the topic in the textbook.

2. The lesson begins with a quick frontal oral interview on a given topic.

3. In classes, students work with lecture notes, slides.

4. For classes, you need to have a notebook for recording theoretical material, a textbook.

6. At the end of the class, homework is given on the new topic and it is proposed to draw up tests on the material passed, which were studied in the lesson (summary).

7. Performances and activity of students for the lesson are evaluated by the current assessment.

#### **Guidelines for the preparation of the report**

1. Self-selection by the student of the topic of the report.

2. Selection of literary sources on the selected topic from the recommended main and additional literature offered in the working program of the discipline, as

well as work with the resources of the information and telecommunication network "Internet" specified in the working program.

3. Work with the text of scientific books, textbooks is not only a reading of the material, it is also necessary to conduct an analysis selected by literature, compare the presentation of the material on the topic in different literary sources, select the material in such a way that it reveals the topic of the report.

4. The analysed material is inspected, the most important thing should not be simply conscientious rewriting of the source texts from selected literary sources without any comments and analysis.

5. Based on the analysis and synthesis of literature, the student draws up a plan for the report, on the basis of which the text of the report is prepared.

6. The report should be structured logically, the material is presented in an integral, coherent and consistent manner, conclusions are made. It is desirable that the student can express his opinion on the formulated problem.

7. The report takes 7-10 minutes. The report is told, not read on paper.

### Self-study topics:

1. Clinical and pharmacological characteristics of drugs used in allergic diseases.
2. Clinical pharmacology of drugs used in cerebral circulation disorders.
3. Clinical pharmacology of hepatoprotective agents.
4. Clinical immunopharmacology.
5. Clinical pharmacology of thyroid hormones.
6. Clinical pharmacology of mucolytics and expectorants.
7. Hypolipidemic drugs

## IV. CONTROL OF ACHIEVEMENT OF COURSE OBJECTIVES

№	Controlled sections / topics of the discipline	Code and name of achievement indicator	Learning Outcomes	Evaluation tools	
				Current control	Intermediate certification
1	Module 1. General issues of clinical pharmacology.	UC-6.1; UC-6.3; UC-7.1; UC-9.1; UC-9.2; UC-10.2	Knowledge	OQ-1 Interview, WW-1 Test	questions for the exam 1-22
			Abilities	WW-11 Multi-level tasks and tasks, WW - 14 Case	
			Skills	WW-11 Multi-level tasks and tasks, WW - 14 Case	
2	Module 2 Specific issues Clinical Pharmacology	UC-6.1; UC-6.3; UC-7.1;	Knowledge	OQ - 1 Interview, OQ-3 Report, WW -1 test	questions for the exam 23-90

	Issues	UC-9.1; UC-9.2; UC-10.2	Abilities	WW -11 <b>Multi-level tasks and tasks</b> , WW - 14 Case	
			Skills	WW -11 Multi-level tasks and tasks, WW - 14 Case	

Typical control tasks, methodological materials defining the procedures for assessing knowledge, skills and (or) experience of activity, as well as qualitative evaluation criteria that describe the level of competence formation, are presented in section VIII.

## V. LIST OF EDUCATIONAL LITERATURE AND INFORMATIONAL-METHODICAL REQUIREMENTS FOR THE DISCIPLINE

### Primary

Kukes V.G., Clinical pharmacology: textbook / KukesV.G. - M.: GEOTAR-Media, 2018. - 1024 p.

### Additional

1. 1. Clive Page Pharmacology: a clinical approach Publisher: Logosfera, 2012-373s.

2. 2. Clinical pharmacology: national guidelines / ed. Yu.B. Belousova, V.G. Kukes, V.K. Lepakhina, V.I. Petrov. - M.: GEOTAR - Media, 2014. - 976 p.

3. 3. Clinical pharmacology: textbook / ed. V. G. Kukes. - 5th ed., revised. and additional - M.: GEOTAR-Media, 2015. <http://www.studmedlib.ru>

4. 4. Clinical pharmacology: a textbook for students of institutions of higher professional education studying in the specialties "Medicine", "Pediatrics", "Pharmacy" in the discipline "Clinical pharmacology": / V. G. Kukes [and others]; ed. V. G. Kukes, D. A. Sychev. - 5th ed., corrected. and additional - M.: GEOTAR-Media, 2015.

5. 5. Petrov V.I., Clinical pharmacology and pharmacotherapy in real medical practice: master class [Electronic resource]: textbook / Petrov V.I. - M.: GEOTAR-Media, 2015. - 880 p.

6. 6. Means influencing the blood coagulation system: a textbook for residents of clinical departments of medical universities / S.V. Veselov [and others] / under.

total ed. S.V. Chervontsev. Tver: Ed.-ed. center of the Tver state. medical university, 2017. 110 p.

7. 7. Ushkalova E.A., Zyryanov S.K., Pereverzev A.P. Clinical pharmacology of non-steroidal anti-inflammatory drugs: Proc. Benefit. Publisher: MIA ed., 2018-368 pages

### **The list of resources of the information-telecommunication network “Internet”**

1. Federal Electronic Medical Library (FEMB) - full-text database TsNMB  
<http://www.femb.ru/feml/>
2. Official website of the Ministry of Health of the Russian Federation  
<http://www.rosminzdrav.ru>
3. Rubricator of clinical recommendations <http://cr.rosminzdrav.ru/#!/>
4. GIS "National Electronic Library" NEL RSL <https://rusneb.ru/>
5. NORA: "National aggregator of open repositories of Russian universities"  
<https://openrepository.ru/uchastniki>
6. Legal portal "Consultant Plus" <http://www.consultant.ru/>
7. Cyberleninka <https://cyberleninka.ru/>
8. PubMed <https://www.ncbi.nlm.nih.gov/pubmed>
9. Database published by Elsevier <http://www.sciencedirect.com/>

## **VI. METHODOLOGICAL RECOMMENDATIONS ON THE COMPLETING THE DISCIPLINE**

**Planning and organizing the time allotted for the study of the discipline.**  
You should start mastering the discipline immediately at the very beginning of the academic semester. It is recommended to study the structure and main provisions of the Work Program of the academic discipline. Please note that in addition to classroom work (lectures, practical exercises), independent work is planned, the results of which affect the final assessment based on the results of mastering the academic discipline. All assignments (classroom and independent) must be completed and submitted for evaluation in accordance with the schedule.

In the process of studying the discipline, various methods and means of mastering the educational content are offered: lectures, practical classes, tests, testing, self-preparation of students.

Lectures are the main active form of conducting in-class studies, explaining the fundamental and most difficult theoretical sections of human anatomy, which involves intense mental activity of the student and is especially difficult for first-year students. The lecture should always be informative, developing, improve skills and provide guidelines. Lecture notes help to master the theoretical material of the discipline. When listening to a lecture, it is necessary to outline the most important things and preferably in your own formulations, which allows you to better remember the material. The abstract is useful when it is written by the student himself. You can develop your own abbreviation scheme. The title of topics, paragraphs can be highlighted with colored markers or pens. In the lecture, the teacher gives only a small part of the material on certain topics that are presented in the textbooks. Therefore, when working with lecture notes, it is always necessary to use the main textbook and additional literature that are recommended for this discipline. It is such a serious work of a student with lecture material that allows him to achieve success in mastering new knowledge. To illustrate verbal information, presentations, tables, diagrams on the board are used. In the course of the presentation of the lecture material, problematic questions or questions with elements of discussion are posed.

*Practical exercises* - a collective form of consideration of educational material. Seminars, which are also one of the main types of practical classes designed for in-depth study of the discipline, taking place in an interactive mode. In the classroom on the topic of the seminar, questions are sorted out and then, together with the teacher, a discussion is held, which is aimed at consolidating the material under discussion, developing the skills to debate, develop independence and critical thinking, the ability of students to navigate large information flows, develop and defend their own position on problematic issues academic disciplines. Practical classes help students to better understand the educational material, to acquire the skills of creative work on documents and primary sources.

Plans for practical classes, their topics, recommended literature, the purpose and objectives of its study are reported by the teacher at introductory classes or in the curriculum for this discipline. Before proceeding to the study of the topic, it is necessary to familiarize yourself with the main questions of the practical lesson plan and the list of recommended literature.

Starting preparation for a practical lesson, it is necessary, first of all, to refer to the lecture notes, sections of textbooks and manuals in order to get a general idea of the place and significance of the topic in the course being studied. Then work with additional literature, make notes on the recommended sources. In the process of studying the recommended material, it is necessary to understand the construction of the topic under study, highlight the main provisions, trace their logic and thereby delve into the essence of the problem under study. It is necessary to keep records of the studied material in the form of a summary, which, along with visual, includes motor memory and allows you to accumulate an individual fund of auxiliary materials for quickly repeating what you have read, for mobilizing accumulated knowledge. The main forms of recording: plan (simple and detailed), extracts, abstracts. In the process of preparation, it is important to compare sources, think over the material being studied and build an algorithm of actions, carefully consider your oral presentation. At a practical lesson, each participant should be ready to speak on all the issues raised in the plan, be as active as possible when considering them. The speech must be convincing and reasoned, and simple reading of the abstract is not allowed. It is important to show your own attitude to what is being said, to express your personal opinion, understanding, justify it and draw the right conclusions from what has been said. At the same time, you can refer to notes of abstracts and lectures, directly to primary sources, use knowledge of monographs and publications, facts and observations of modern life, etc. A student who did not have time to speak at a practical lesson can present the prepared abstract to the teacher for verification and, if necessary, answer the teacher's questions on the topic of the practical lesson to get a credit mark on this topic.

As methods of active learning, they are used in practical classes: a press conference, a detailed conversation, a debate.

A *detailed conversation* involves preparing students for each issue of the lesson plan with a single list of recommended mandatory and additional literature for all. Reports are prepared by students on a pre-proposed topic.

*Disputing* in a group has a number of advantages. The dispute can be called by the teacher during the lesson or planned in advance by him. In the course of the controversy, students develop resourcefulness, speed of mental reaction.

*Press conference.* The teacher instructs 3-4 students to prepare short reports. Then one of the members of this group makes a report. After the presentation, students ask questions, which are answered by the speaker and other members of the expert group. Based on questions and answers, a creative discussion unfolds with the teacher.

**Revising reference books.** It is recommended to use various opportunities for working with literature: the collections of the FEFU Scientific Library (<http://www.dvfu.ru/library/>) and other leading universities of the country, as well as scientific library systems available for use.

**Preparation to exam.** Students who have completed all the tasks (practical, independent) provided for by the curriculum of the discipline, who have attended at least 85% of classroom classes, are allowed to take the exam.

## VII. CLASSROOM, EQUIPMENT AND MATERIAL REQUIREMENTS FOR THE DISCIPLINE

### Logistics and discipline software

Name of special rooms and rooms for independent work	Equipment of special rooms and rooms for independent work	List of licensed software.
690922, Primorsky Territory, Vladivostok, Russian Island, Saperny Peninsula, Ayaks settlement,	Multimedia Audience: Monoblock Lenovo C360G-i34164G500UDK; Projection screen ProjectaElproElectrol,	Windows Seven Enterprise SP3x64Operating system  Microsoft Office Professional Plus 2010  an office suite that includes software for



<p>10 M421</p> <p>Training room for classes</p> <p>seminar and lecture type</p>	<p>300x173 cm; Multimedia projector, Mitsubishi FD630U, 4000 ANSI Lumen, 1920x1080; Mortise interface with automatic cable retraction system TLS TAM 201 Stan; Document camera Avervision CP355AF; Sennheiser EW 122 G3 UHF lavalier radio system as part of a wireless microphone and receiver; LifeSizeExpress 220-Codeonly-Non-AES video conferencing codec; Network video camera Multipix MP-HD718; Two LCD panels 47", Full HD, LG M4716CCBA; Audio switching and sound amplification subsystem; centralized uninterruptible power supply</p>	<p>working with various types of documents (texts, spreadsheets, databases, etc.);</p> <p>7Zip 9.20 - free file archiver with a high degree of data compression;</p> <p>ABBYY FineReader 11 - software for optical character recognition;</p> <p>Adobe Acrobat XI Pro 11.0.00 - a software package for creating and viewing electronic publications in PDF format;</p> <p>WinDjView 2.0.2 is a program for recognizing and viewing files with the same name format DJV and DjVu.</p>
<p>Reading rooms of the FEFU Scientific Library with open access to the fund (building A - level 10) (roomforself-study)</p>	<p>HP ProOpe 400 All-in-One 19.5 (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD+/-RW,GigEth,Wi-Fi,BT,usbkbd/ mse,Win7Pro (64-bit)+Win8.1Pro(64-bit),1-1-1 Wty Internet access speed 500 Mbps. Workplaces for people with disabilities are equipped with Braille displays and printers; equipped with: portable devices for reading flat-print texts, scanning and reading machines, a video enlarger with the ability to regulate color spectra; magnifying electronic loupes and ultrasonic markers</p>	<p>Windows Seven Enterprise SP3x64Operating system</p> <p>Microsoft Office Professional Plus 2010 an office suite that includes software for working with various types of documents (texts, spreadsheets, databases, etc.);</p> <p>7Zip 9.20 - free file archiver with a high degree of data compression;</p> <p>ABBYY FineReader 11 - software for optical character recognition;</p> <p>Adobe Acrobat XI Pro 11.0.00 - a software package for creating and viewing electronic publications in PDF format;WinDjView 2.0.2.</p>

The educational process in the discipline is conducted in lecture, computer classes of the building of the School of Biomedicine of the FEFU campus, equipped with computers and multimedia systems, connected to the general corporate network of FEFU and the Internet.

For carrying out practical work, as well as for organizing independent work, students have access to the following laboratory equipment and specialized classrooms that meet applicable sanitary and fire regulations, as well as safety requirements for educational and research and production work.

## **VIII. VALUATION FUNDS**

For the discipline Clinical Pharmacology, the following evaluation tools are used:

Oral questioning:

1. Interview (OQ-1)
2. Presentation / report (OQ-3)

Written papers:

1. Test (WW-1)
2. Abstract (WW-4)
3. Multi-level tasks and tasks (WW -11)
4. Case (WW -14)

### **Oral Questioning**

An oral survey allows you to evaluate the knowledge and horizons of the student, the ability to logically construct an answer, the possession of monologue speech and other communication skills.

Interview (I-1) is a means of control organized as a special conversation between a teacher and a student on topics related to the discipline being studied, and designed to determine the amount of knowledge of the student in a particular section, topic, problem, etc.

Presentation / message (P-3) - a product of the student's independent work, which is a public performance to present the results of solving a specific educational, practical, educational, research or scientific topic.

### **Written papers**

A written answer teaches to the accuracy, conciseness, coherence of the presentation of thought. Written verification is used in all types of control and is carried out both in classroom and extracurricular work.

Test (WW-1) is a system of standardized tasks that allows you to automate the procedure for measuring the level of knowledge and skills of a student.

Reference paper (WW-4) - The product of the student's independent work, which is a summary in writing of the results of the theoretical analysis of a certain scientific (educational and research) topic, where the author reveals the essence of the problem under study, gives different points of view, as well as his own views on it .

Multi-level tasks and tasks (WW-11). Distinguish tasks and tasks:

a) the reproductive level, which allow assessing and diagnosing knowledge of factual material (basic concepts, algorithms, facts) and the ability to correctly use special terms and concepts, recognition of objects of study within a certain section of the discipline;

b) reconstructive level, allowing to evaluate and diagnose the ability to synthesize, analyze, generalize factual and theoretical material with the formulation of specific conclusions, the establishment of cause-and-effect relationships;

c) creative level, allowing to evaluate and diagnose skills, integrate knowledge of various fields, argue one's own point of view.

Case (WW-14) is a problematic task in which the student is asked to comprehend the real professionally oriented situation necessary to solve this problem.

### **Methodological recommendations defining procedures for assessing the results of discipline**

#### **Evaluation funds for interim certification**

Intermediate certification of students in the discipline "Clinical pharmacology" is carried out in accordance with local regulations of FEFU and is mandatory. Form of discipline reporting - exam (12th, spring semester). The examination in the discipline can be conducted both in the form of an oral interview and in the form of testing. The oral examination in the discipline includes answers to 3 questions.

### **Methodological guidelines for passing the exam**

The exam is accepted by the leading teacher. With a large number of groups with one teacher or with a large number of flows, by order of the director of the department (deputy director for educational and educational work), it is allowed to attract other teachers to help the leading teacher. First of all, teachers are involved who conducted practical classes in the discipline in groups.

In exceptional cases, in agreement with the Deputy Director of the School for Educational and Educational Work, the Director of the Department has the right to take an exam in the absence of a leading teacher.

The form of the examination (oral, written, etc.) is approved at the meeting of the department in agreement with the head in accordance with the working program of the discipline.

During examination the students can use the working program of discipline and also with the permission of the teacher holding examination, reference books and other grants (textbooks, manuals, the recommended literature, etc.).

The time given to the student to prepare for the answer should be no more than 20 minutes. After this time, the student must be ready to answer.

The presence at the control event of unauthorized persons (except for persons conducting inspections) without the permission of the relevant persons (rector or vice-rector for educational and educational work, director of the School, head of the EP or director of the department) is not allowed. Persons with disabilities and persons with disabilities who do not have the possibility of independent movement are allowed to a control event with accompanying persons.

### **Questions for the exam**

1. Subject and objectives of clinical pharmacology. Sections of clinical pharmacology (clinical pharmacokinetics, pharmacodynamics, pharmacogenetics, pharmacoconomics, pharmacoepidemiology).

2. The concept of pharmacotherapy. Types of pharmacotherapy (etiologic, pathogenetic, symptomatic, preventive). Basic principles of rational pharmacotherapy (minimization, rationality, economy, controllability, individuality). Stages of pharmacotherapy.

3. Undesirable drug reactions. WHO classification: A, B, C, D, E. Toxic drug reactions.

4. Allergic and pseudoallergic drug reactions. Principles of medical care for patients. Bathing anaphylactic shock. Measures to prevent allergic reactions.

5. Risk factors for undesirable drug reactions. diagnosis, correction and prevention of unwanted drug reactions. Rules for notifying state supervision of medicines about the occurrence of undesirable drug reactions.
6. Drug interaction. Types of interaction. pharmaceutical interaction.
7. The concept of drug interaction. Pharmacokinetic interaction (at levels of absorption, distribution, metabolism, excretion).
8. The concept of drug interaction. Pharmacodynamic interaction of drugs (direct and indirect). Synergism and antagonism.
9. Interaction of drugs with food, alcohol, tobacco smoke components, phytopreparations. Risk factors for drug interaction.
10. Features of pharmacokinetics and pharmacodynamics of drugs in pregnant women and the fetus. Fetal risk categories according to WHO: A, B, C, D, E, X.
11. Principles of pharmacotherapy in pregnant women. Critical periods. Teratogenicity, embryotoxicity and fetotoxicity of drugs. Features of pharmacokinetics and pharmacodynamics in nursing.
12. Features of pharmacokinetics and pharmacodynamics of drugs in children. Calculation of the dose of the drug in children. Features of pharmacotherapy in children.
13. Features of pharmacokinetics and pharmacodynamics of drugs in the elderly. Calculation of the dose of the drug in the elderly. Features of pharmacotherapy in elderly and senile patients.
14. Clinical pharmacoeconomics. Criteria for pharmacoeconomic research. Estimate of the cost of drug treatment (cost estimate). Types of pharmacoeconomic analysis.
15. Clinical drug research: clinical research phases, concept of GCP, ethical and legal norms of clinical research, participant in clinical research, protocols.
16. Evidence-based medicine: principles, levels, evidences. Endpoints of clinical research. Meta-analysis. The importance of evidence-based medicine in clinical practice.
17. Mechanisms of action of drugs. Antagonists, agonists, partial agonists. Drug target molecules.
18. Types of pharmacological response: expected pharmacological response, hyperreactivity, tachyphylaxis, idiosyncrasy.
19. Evaluation of drug efficacy and safety. Therapeutic drug monitoring (indications, clinical significance, interpretation of results).
20. Clinical pharmacokinetics. Basic pharmacokinetic parameters and their clinical significance. Pharmacokinetic curve.
21. Patient adherence to treatment. Features of long-term pharmacotherapy. Combined use of drugs.

22. Calculation of drug dose in patients with chronic renal failure. Dose correction in patients with impaired liver function.

23. Agents used in coronary heart disease. Classification of antianginal agents. Algorithm for first aid for an attack of angina pectoris.

24. Clinical pharmacology of organic nitrates. Application features. Mechanism of action. Characterization of individual drugs. Indications for use. Complications.

25. Pharmacological characterization of  $\beta$ -blockers. Mechanism of action. Main effects. Indications for use. Side effects.

26. Pharmacological characterization of calcium channel blockers. Mechanism of action. Indications for use. Side effects.

27. Clinical pharmacology of hypocholesterolemic agents: features of pharmacokinetics, pharmacodynamics. Testimony. Contraindications. Side effects.

28. Clinical pharmacology of anticoagulants. Classification. Mechanism of action. Features of pharmacokinetics, pharmacodynamics. Clinical application. Side effects.

29. Clinical pharmacology of antiplatelets. Classification. Mechanism of action. Features of pharmacokinetics, pharmacodynamics. Clinical application. Side effects.

30. Agents affecting fibrinolysis. Classification. Pharmacological characterization. Mechanism of action. Features of pharmacokinetics, pharmacodynamics. Assignment rules. Testimony. Contraindications.

31. Classification of antihypertensive agents. Basic principles of arterial hypertension treatment. Pharmacotherapy of hypertensive crisis

32. Clinical pharmacology of antihypertensive drugs of the central mechanism of action. Application features. Indications, contraindications to use; side effects, methods of their prevention; the nature of interactions with drugs of other groups.

33. Clinical pharmacology of  $\alpha$ -blockers. Application features. Indications, contraindications to use; side effects, methods of their prevention; the nature of interactions with drugs of other groups.

34. Clinical pharmacology of ganglioblockers. Application features. Indications, contraindications to use; side effects, methods of their prevention.

35. Clinical pharmacology of myotropic agents. Application features. Indications, contraindications to use; side effects, methods of their prevention.

36. Clinical pharmacology of diuretics. Application features. Indications, contraindications to use; side effects, methods of their prevention; the nature of interactions with drugs of other groups.

37. Substances affecting the renin-angiotensin system. Pharmacological characterization of ACE inhibitors and angiotensin receptor blockers. Indications for use. Side effects

38. Cardiac glycosides. Sources of receipt. Features of the structure. Mechanism of action. Indications for use. Signs of intoxication by cardiac glycosides. Treatment of glycosidic intoxication.

39. Cardiotonic agents of non-glycosidic nature. Drugs. Mechanisms of cardiotonic action. Application. Side effects

40. Antiarrhythmic agents. Classification of drugs. Basic principles of treatment of rhythm disorders.

41. Antiarrhythmic drugs. Myocardial cell membrane stabilizing agents and calcium antagonists. Mechanism of action. Pharmacological characterization. Indications for use. Side effects.

42. Antiarrhythmic drugs.  $\beta$ -blockers and agents increasing the duration of action potential. Pharmacological characterization. Indications for use. Side effects.

43.  $\beta$ 2-adrenomimetics. Mechanism of action. Application features. Side effects.

44. Principles of bronchial asthma pharmacotherapy. Main drug groups. Routes of introduction. Emergency care for a bronchial asthma attack

45. Clinical pharmacology of M-cholinoblockers. Application features. Indications, contraindications to use; side effects, methods of their prevention.

46. Antihistamines (H1-histamine receptor blockers). Classification. Mechanism of action. Features of individual drugs. Application. Side effects. Contraindications.

47. Classification of nonsteroidal anti-inflammatory agents. Major effects of nonsteroidal anti-inflammatory agents. Mechanism of action.

48. Pharmacokinetic and pharmacodynamic features of drugs (NSAID). Indications for use. Side effects and methods of their prevention.

49. Inhalation anesthesia. Classification. Mechanism of action. Pharmacological characterization of drugs. Application. Undesirable effects.

50. Remedies for non-inhalation anesthesia. Features of the action of individual drugs. Application. Side effects.

51. Sleeping pills. Classification. Mechanism of action. Pharmacological characterization of drugs. Indications for use. Side effects.

52. Antiepileptic agents. Classification. Mechanisms of action of individual groups. Examples of preparations, undesirable reactions.

53. Antiparkinsonic agents. Classification. Mechanisms of action of individual drug groups. Application, undesirable reactions.

54. Narcotic analgesics. Classification. Mechanism of analgesic action. Drugs. Application. Undesirable reactions.
55. Pharmacological effects of morphine. Side effects. Mechanism of addiction and drug dependence development.
56. Tranquilizers (anxiolytics). Classification. Mechanism of action. Drugs. Indications for use. Pharmacological effects of tranquilizers. Side effects.
57. Antipsychotics (neuroleptics). Classification. Mechanism of action. Pharmacological effects. Indications for use. Side effects.
58. Antidepressants. Classification. Mechanism of action. Pharmacological effects. Indications for use. Side effects.
59. Medications that improve brain blood flow: drugs, mechanism of action. Their pharmacological properties and use.
60. Drugs used to treat migraine. Classification, mechanism of action, pharmacological characterization, indications for use, side effects.
61. Hypertensive agents. Classification. Mechanism of action. Comparative characterization of drugs. Application. Side effects.
62. Agents used to treat acute heart failure. Classification. Mechanism of action. Pharmacological characterization of drugs. Assignment features.
63. Thyroid hormone preparations and antithyroids. Mechanism of action. Pharmacological characterization. Indications for use. Side effects.
64. Hypothalamus and pituitary hormone preparations. Classification. Mechanism of action. Pharmacological characterization. Indications for use. Gonadotropic hormone inhibitors.
65. Pancreatic hormone preparations. Effect on metabolism. Insulin drugs. Classification. Hypoglycemic mechanism, dosing regimen. Application.
66. Synthetic hypoglycemic agents. Classification. Mechanism of action. Pharmacological characterization. Application. Side effects.
67. Glucocorticosteroids. Classification. Mechanism of action. Effects on the body. Indications for use. Side effects
68. Agents that reduce gastric gland secretion (H<sup>+</sup> blockers, K<sup>+</sup>-ATP/ases, histamine H<sub>2</sub> receptor blockers, M-cholin blockers). Drugs. Mechanisms of action. Side effects. Indications for use.
69. Principles of pharmacotherapy of gastric ulcer, features of the use of drugs.
70. Hepatoprotectants. Pharmacological characterization. Indications for use.
71. Antihistamines. Classification. Mechanism of action. Features of individual drugs. Application. Side effects. Contraindications.
72. Antibiotics. Classification by chemical structure, mechanism and spectrum of action. Principles of antibacterial therapy. Side effects of antibiotics.



73. The main mechanisms for the formation of resistance to antibacterial drugs. Ways to overcome the resistance of pathogens to antibacterial drugs.

74. The concept of minimum suppressive concentration, average therapeutic and toxic concentration. Significance of indicators in clinical practice.

75. Types of antimicrobial therapy. Features of antibiotic prescribing. Indications for use. Side effects, methods of their prevention. Contraindications.

76. Beta-lactam antibiotics. Classification. Pharmacological characterization of antibiotics of the monobactam and carbapenem group. Mechanisms for the development of bacterial resistance to B-lactam antibiotics. B-lactamase inhibitors.

77. Biosynthetic penicillins. Mechanism of action and spectrum of antimicrobial action. Pharmacokinetics and pharmacodynamics of drugs. Indications for use. Side effects.

78. Semisynthetic penicillins. Mechanism of action and spectrum of antimicrobial action. Pharmacokinetics and pharmacodynamics of drugs. Indications for use. Side effects.

79. Antibiotics are cephalosporins. Mechanism and spectrum of antimicrobial action. Pharmacokinetics and pharmacodynamics of drugs. Indications for use. Side effects.

80. Antibiotics of the tetracycline, levomycetine and macrolides group. Mechanism and spectrum of action. Pharmacokinetics and pharmacodynamics of drugs. Indications for use. Side effects.

81. Antibiotics of the aminoglycoside group and cyclic polypeptides. Mechanism and spectrum of action. Pharmacokinetics and pharmacodynamics of drugs. Indications for use. Side effects.

82. Sulfanilamide preparations. Classification. Mechanism and spectrum of action. Pharmacokinetics and pharmacodynamics of drugs. Application. Side effects. Combination drugs.

83. Synthetic antibacterial agents are derivatives of quinolone, 8-oxyquinoline, nitrofurantoin and quinoxaline. Mechanism of action. Pharmacological characterization. Indications for use. Side effects.

84. Clinical pharmacology of the fluoroquinolone group. Features of antibiotic prescribing. Indications for use. Side effects, methods of their prevention. Contraindications.

85. Antisphylytic agents. Classification. Mechanism of action. Pharmacological characterization of drugs. Application. Side effects.

86. Antibiotics used to treat tuberculosis. Classification. Mechanism of action. Pharmacokinetics and pharmacodynamics of drugs. Application. Side effects.

87. Synthetic anti-tuberculosis agents. Mechanism of action. Pharmacological characterization of drugs. Application. Side effects.

88. Antiviral agents. Classification. Mechanism of action. Pharmacological characterization. Application. Side effects.

89. Antifungal antibiotics. Mechanism and spectrum of action. Pharmacodynamics and pharmacokinetics of drugs. Indications for use. Side effects.

90. Synthetic antifungals. Classification. Mechanism and spectrum of action. Pharmacological characterization. Application. Side Effects Anticancers. Classification. Mechanism of action. Pharmacological characterization of drugs. Indications for use. Side effects.

### **Criteria for rating a student in the Clinical Pharmacology examination**

<b>Evaluationoftheexam</b>	<b>Requirementstoformedcompetencies</b>
«excellent»	The score is "excellent" to the student if he has deeply and firmly learned the program material, exhaustively, consistently, clearly and logically, sets it out, knows how to closely link theory with practice, Freely cope with tasks, issues and other applications of knowledge, Note here that response is not hampered by modification of tasks and uses monographic literature material in response; correctly justifies the decision made, has versatile skills and techniques for performing practical tasks;
«good»	The "good" rating is presented to the student if he firmly knows the material, competently and essentially sets it out, avoiding significant inaccuracies in the answer to the question, correctly applies theoretical provisions in solving practical issues and problems, and has the necessary skills and techniques to fulfill them;
«satisfactorily»	The rating "satisfactorily" is presented to the student if he has knowledge only of the basic material, but has not learned its details, admits inaccuracies, insufficiently correct formulations, violations of the logical sequence in the presentation of the program material, and is experiencing difficulties in performing practical work;
«unsatisfactory»	The rating is "unsatisfactory" to a student who does not know a significant part of the program material, makes significant mistakes, insecure, with great difficulties performs practical work.

### **Evaluation tools for the current appraisal**

The current certification of students in the discipline is carried out in accordance with local regulations of FEFU and is mandatory.

The current certification is carried out in the form of control measures (abstracts, reports, test tasks, situational tasks) to evaluate the actual results of student training and is carried out by a leading teacher.

The evaluation objects are:

- training discipline (activity in classes, timeliness of performance of various types of tasks, attendance of all types of classes in the certified discipline);

Degree of assimilation of theoretical knowledge;

- Level of practical skills and skills in all types of training;

- results of independent work.

A schedule of control measures for discipline is drawn up. Assessment of attendance, activity of students in classes, timeliness of execution of various types of tasks is carried out on the basis of a journal.

### **Topics of reference papers (abstract) and presentations:**

1. Metabolic syndrome. Definition. Diagnosis and methods of examination.

Clinical-pharmacological approach to treatment.

2. Principles of pharmacotherapy in pregnant women, children and the elderly.

3. Acute heart failure. Basic principles of treatment. Choice of drugs and dosing regimen. Tactics for treating selected clinical manifestations of acute heart failure. Methods for controlling treatment effectiveness.

4. Ischemic stroke and transient ischemic attacks. Primary and secondary prevention. Clinical and pharmacological approaches to treatment

5. Medicine and patient. The concept of compliance and methods for increasing it. Clinical and pharmacological aspects of learning in patient schools.

6. Clinical pharmacology of antifungal drugs.

7. Medications affecting cerebral circulation. Neuroprotective drugs.

8. Venotonic means. Clinical and pharmacological approaches to the selection and use of drugs in chronic venous insufficiency.

9. Clinical pharmacology of drugs used in anemia.

10. Thyroid disease. Clinical-pharmacological approaches to treatment. Control of efficacy and safety of therapy.

11. Hyperlipidemia. Etiology and pathogenesis. Treatment tactics for lipid metabolism disorder and effectiveness assessment. Hypolipidemic agents.

### **Criteria for evaluating the abstract.**

The stated understanding of the abstract as a holistic author's text determines the criteria for its evaluation: the novelty of the text; the validity of the choice of source;

the degree of disclosure of the essence of the issue; compliance with formatting requirements.

The originality of the text: a) the relevance of the research topic; b) novelty and independence in posing the problem, formulating a new aspect of a well-known problem in establishing new connections (interdisciplinary, intradisciplinary, integration); c) the ability to work with research, critical literature, systematize and structure the material; d) the manifestation of the author's position, the independence of assessments and judgments; e) stylistic unity of the text, unity of genre features.

The degree of disclosure of the essence of the issue: a) compliance of the plan with the topic of the abstract; b) compliance of the content with the topic and plan of the abstract; c) completeness and depth of knowledge on the topic; d) the validity of the methods and methods of working with the material; f) the ability to generalize, draw conclusions, compare different points of view on one issue (problem).

The validity of the choice of sources: a) assessment of the literature used: whether the most famous works on the research topic were involved (including journal publications of recent years, the latest statistics, summaries, references, etc.).

Compliance with the requirements for design: a) how correctly the references to the literature used, the list of references are formatted; b) assessment of literacy and culture of presentation (including spelling, punctuation, stylistic culture), knowledge of terminology; c) compliance with the requirements for the volume of the abstract.

The reviewer should clearly formulate the remark and questions, preferably with links to the work (possibly to specific pages of the work), to research and factual data that the author did not take into account.

The reviewer can also indicate: whether the student has previously addressed the topic (abstracts, written works, creative works, olympiad works, etc.) and whether there are any preliminary results; how the graduate did the work (plan, intermediate stages, consultation, revision and revision of the written or lack of a clear plan, rejection of the leader's recommendations).

The student submits an abstract for review no later than a week before the defense. The teacher is the reviewer. Experience shows that it is advisable to familiarize the student with the review a few days before the defense.

Opponents are appointed by the teacher from among the students. For an oral presentation, a student needs 10-20 minutes (approximately so much time answers the tickets for the exam).

**Grade 5** is given if all the requirements for writing and defending the abstract are met: the problem is identified and its relevance is justified, a brief analysis of various points of view on the problem under consideration is made and one's own position is logically stated, conclusions are formulated, the topic is fully disclosed, the volume is maintained, the requirements for external design, correct answers to additional questions are given.

**Grade 4** - the basic requirements for the abstract and its defense are met, but there are some shortcomings. In particular, there are inaccuracies in the presentation of the material; there is no logical sequence in judgments; the volume of the abstract is not maintained; there are omissions in the design; incomplete answers were given to additional questions during the defense.

**Grade 3** - there are significant deviations from the requirements for referencing. In particular: the topic is covered only partially; there are factual errors in the content of the abstract or in answering additional questions; no output during protection.

**Grade 2** - the topic of the abstract is not disclosed, a significant misunderstanding of the problem is found.

**Grade 1** - the abstract is not submitted by the student.

### **Examples of tests**

1. Which definition corresponds to the average therapeutic dose:
  - A) The amount of a substance that causes the initial biological effect
  - B) The amount of a substance that causes effects dangerous to the body
  - C) The amount of a substance that has the vast majority patients required pharmacotherapeutic action
  - D) The amount of a substance that quickly creates a high concentration drug in the body
2. What does the concept of pharmacodynamics include:
  - A) Mechanisms of action of drugs
  - B) The transformation of drugs in the body
  - B) Distribution of drugs in the body
  - D) Excretion of drugs from the body
3. In hypertension, beta-blockers are used to:
  - A) Peripheral vasodilation and a decrease in total peripheral vascular resistance
  - B) Decrease in the volume of circulating blood
  - C) decrease in cardiac output and decrease in cardiac output
  - D) Decreased tone of vasomotor centers
4. The mechanism of the anticoagulant action of non-fractional heparin:

- A) Violation of the activity of II, VII, IX, X blood coagulation
- B) Inhibition of the synthesis of II, VII, IX, X, XI blood coagulation
- C) Inhibition of adhesion and aggregation of platelets
- D) Increased fibrinolytic activity of the blood

5. Note the side effects characteristic of aminoglycosides:

- A) Anemia, thrombocytopenia
- B) Liver damage
- C) Hearing loss, vestibular disorders, nephrotoxicity
- D) Visual impairment, bulbar disorders

### **Test evaluation criteria**

The results of the test tasks are evaluated by the teacher on a five-point scale for attestation or on a "set-off" - "not set-off" system.

The score is "excellent" if the correct answer is 90% or more of their tests offered by the teacher.

The score is "good" - with the correct answer to 80 -89% of test tasks.

The score is "satisfactory" - if the correct answer is 75-79% of the proposed tests.

### **Cases**

#### **Task 1**

Patient M., 50, complained of congenital pain, shortness of breath when walking. Pains pressing, compressing, are not associated with exercise, more often occur at night, last 15-20 minutes. Taking nitroglycerin does not always stop pain syndrome. When recording ECG during pain, a 2 mm rise in segment S - T was recorded in the leads from the anterior wall of the left ventricle, after stopping the pain, a return of S - T to the isoelectric line was noted.

Objective data: skin of ordinary color. There are no peripheral edema. In the lungs, the breath is vesicular, there are no wheezes. During heart auscultation: tones are muted, the rhythm is correct, HR = 76 in minutes, BP = 140/90 - 150/100 mm Hg. Art. The abdomen during palpation is soft, painless in all parts. The liver is not enlarged. When evaluating the blood lipid profile, dyslipidemia was found with high total cholesterol (7.0 mmol/L) and LDL cholesterol (4.5 mmol/L).

Diagnosis: CHD: vasospastic angina pectoris. Stage 3 hypertensive disease, grade 1 arterial hypertension, risk 4 (very high). Left ventricular hypertrophy. Stage 1 chronic heart failure (II functional class).

Treatment prescribed:

1. Aspirin cardio 100 mg - 1 once a lunch, after a meal.
2. Amlodipine 10 mg in the morning.
3. Bisoprolol 2.5 mg in the morning.
4. Atorvastatin 10 mg in the evening.

5. Ramipril 2.5 mg in the morning.

Against the background of the therapy, the patient noted the cessation of pain behind the sternum, but a few days later he drew attention to the appearance of swelling in the area of the feet and shins of both legs.

***Which drug of the prescribed drugs could cause these phenomena?***

### **Task 2**

A patient of 64 years old was diagnosed with CHD: tension angina II FC. Permanent form of atrial fibrillation, tachysystolic form. Stage III hypertensive disease, grade 2 arterial hypertension, risk IV (very high), stage I CHF. Bronchial asthma, persisting form, moderate.

**Choose the most rational combination of drugs:**

- A. Amlodipine + hydrochlorothiazide.
- B. Metoprolol + amlodipine.
- C. Atenolol + enalapril.
- D. Verapamil + enalapril.
- E. Valsartan + indapamide.

### **Task 3**

Patient L., 63, suffers from CHD: functional grade III tension angina. During the year, he constantly takes aspirin - 125 mg/day, nitroglycerin- 6.4 mg 3 times a day. The effect of the therapy is insufficient, congruent pains of a pressing nature with normal physical exertion are preserved. Objective data: skin of ordinary color. In the lungs, the breath is vesicular, there are no wheezes. During heart auscultation: tones are muted, the rhythm is correct, HR = 90 in minutes, BP = 130/70 mm Hg. Art. The abdomen during palpation is soft, painless in all parts. The liver is not enlarged. There are no peripheral edema.

**Choose the most rational options for changing treatment tactics:**

- A. Increase the dose of nitrates by 2 times.
- B. Add amlodipine to treatment.
- C. Add metoprolol to treatment.
- D. Increase aspirin dose to 250 mg/day.
- E. Replace nitroglycerin with isosorbide mononitrate.

### **Task 4**

Patient M., 64, suffers from CHD: functional grade II tension angina, stage 3 hypertension, grade 2 arterial hypertension. At the reception of the local therapist AD = 160/90 mm Hg. Art., HR = 90 in minutes, the rhythm is correct. Prescribed: indapamide 2.5 mg in the morning, metoprolol 25 mg in the morning and evening, aspirin 125 mg/day. After 2 weeks, BP decreased to 140/80 mm Hg. Art., HR - up to 75 strokes per minute, but attacks of angina persist.

**Choose the most rational treatment change options:**

- A. Optionally assign mononitrates.

- B. Optionally assign amlodipine.
- C. Increase metoprolol dose to reduce HR to 55-60 per minute.
- D. Additionally prescribe verapamil.
- E. Replace metoprolol with propranolol.

### **Task 5**

Patient S., 49, at night for the first time in his life developed intense breaking chest pains radiating into both hands. The pain increased unduly, accompanied by sweating, the fear of death. Taking nitroglycerin did not bring relief. An emergency medical team was called. According to the ECG - signs of myocardial damage were recorded on the anterior wall of the left ventricle. After the introduction of narcotic analgesics (delay 1% - 2.0), the pain gradually decreased. The patient was hospitalized in a hospital with a diagnosis: CHD: acute anterior large-hour myocardial infarction.

Treatment prescribed:

- A. Streptokinase 1500000 U - w/w drip for 60 min.
- B. Aspirin of 250 mg inside - 1 time a day.
- C. Atorvastatin 10 mg inside - 1 times a day.
- D. Metoprolol 50 mg inside - 2 times a day.
- E. Enoxaparin 40 U - 2 times a day (injections under the skin of the abdomen).

***Evaluate the rationality of the therapy.***

### **Задача 6**

#### **Task 6**

Patient P., 60 years old, is observed by therapist diagnosed with: CHD: angina strain III functional class. Bronchial asthma, persistent, moderate. Constantly takes aspirin 125 mg/day and isosorbide mononitrate 50 mg in the morning. Recently, notes the increase in attacks of angina pectoris. Turned to correct treatment. Metoprolol 50 mg in extended form was additionally prescribed - 1 time in the morning. Upon re-examination, he notes an increase in attacks of congenital pains, but episodes of weakness and dizziness appeared, during which BP decreased to 100/60 mm Hg. Art. During pulmonary auscultation, dry whistling wheezes appeared at exhalation.

**Choose the most rational treatment change options:**

- A. Cancel Metoprolol and assign trimetazidine.
- B. Cancel Metoprolol and assign amlodipine.
- C. Cancel Metoprolol and prescribe verapamil.
- D. Replace Metoprolol with a more selective beta-blocker bisoprolol.

#### **Task 7**

Patient M., 50, went to the doctor for heart pain arising from exercise. Cycling ergometry was carried out - the test is positive. Treatment with beta-blockers (metoprolol 50 mg 2 times a day) and desaggregants (aspirin 250 mg 1 time a day) is prescribed. Against the background of treatment, pain in the heart decreased, but



abdominal pains, nausea, heartburn appeared. During the FGS, erosions of the pyloric part of the stomach were revealed. The doctor considered this a consequence of taking aspirin, canceled it and prescribed anti-ulcer therapy (omeprazole 40 mg/day). After 4 weeks, no stomach erosion was detected on the control FGS.

**What type of antithrombotic therapy is shown to this patient?**

- A. Replace aspirin with clopidogrel 75 mg/day.
- B. Prescribe aspirin at a minimum dosage of 75 mg/day together with omeprazole.
- C. Replace aspirin with pentoxifylline at 400 mg 3 times a day.
- D. Designate warfarin.

### **Task 8**

Patient B., 62, entered the emergency cardiology department in the first 6 hours from the onset of anginosus status. ECG revealed signs of damage in the anterolateral wall of the left ventricle. There are no signs of heart failure according to auscultation and radiography of the lungs. According to echocardiography, the size of the left ventricular cavity and its contractile function are within normal limits, there are no blood clots in the heart cavities.

Diagnosis: CHD: acute large-eyed anteroposterior myocardial infarction.

**What antithrombotic agents are shown in non-invasive treatment tactics?**

- A. Aspirin.
- B. Heparin.
- C. Warfarin.
- D. Streptokinase.
- E. Pentoxifylline.
- F. Clopidogrel.

### **Evaluation criteria for solving situation problems:**

The score is "excellent" for the student who correctly solved the problem and substantiated his decision, who gave a reference to the regulatory document required for the decision;

A student who correctly solved the problem, but did not substantiate his decision at the proper level, deserves a "good" rating;

A student who has found a sufficient level of knowledge to solve a problem, but who has made errors in solving it, deserves to be rated "satisfactorily";

The rating is "unsatisfactory" to the student who has not solved the problem.