PRIVATE HIGHER EDUCATIONAL INSTITUTION
"INTERNATIONAL ACADEMY OF ECOLOGY AND MEDICINE"
Department of Fundamental Disciplines

WORKING PROGRAM OF EDUCATIONAL DISCIPLINE

"Pharmacology"

LEVEL OF HIGHER EDUCATION Second (master's) level
DEGREE OF HIGHER EDUCATION Master's degree
BRANCH OF KNOWLEDGE 22 Healthcare
SPECIALTY 222 Medicine

Reviewed and approved
at the meeting of the Academic Council
Protocol No. 1, dated August 31, 2017

Kiev 2017

Working program of education discipline Pharmacology for the preparation of students of higher education of the second (master's) level of higher education in specialty 222 Medicine.

INTRODUCTION

The program for the discipline "Pharmacology" is drawn up in accordance with the educational and professional program for the training of specialists of the second (master's) level of the specialty 222 Medicine, the field of knowledge 22 Health care, the Law of Ukraine "On Higher Education" dated 01.07.2014 No. 1556 -VII (13, clause 7), the regulation "On the organization of the educational process at the International Academy of Ecology and Medicine", guidelines approved by the Central Methodological Office of Higher Medical Education of the Ministry of Health of Ukraine for the development of curricula in accordance with the industry standards of higher education. The discipline "Pharmacology" belongs to the section of the General preparation of the curriculum for the preparation of applicants for higher education of the second educational (master's) level.

Description of the discipline

<table>
<tr><td rowspan="2">The name of indicators</td><td rowspan="2">Branch of knowledge, direction of training, educational and qualification level</td><td colspan="2">Characteristics of the discipline</td></tr>
<tr><td colspan="2">Daytime education</td></tr>
<tr><td>Amount of credits – 7,0</td><td>Field of knowledge:
22 Health care</td><td colspan="2"></td></tr>
<tr><td>Modules – 2</td><td rowspan="5">Specialty:
222 Medicine</td><td colspan="2">Year of preparation: The 3-rd</td></tr>
<tr><td>Content modules – 8</td><td colspan="2">Semesters:</td></tr>
<tr><td></td><td>The 5th</td><td>The 6th</td></tr>
<tr><td>The amount of hours -210</td><td colspan="2">Lectures</td></tr>
<tr><td rowspan="8"></td><td rowspan="8">Tyupe: Mandatory</td><td>20 h.</td><td>10 h.</td></tr>
<tr><td colspan="2">Practical</td></tr>
<tr><td>40 h.</td><td>30 h.</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">Independent (individual) work</td></tr>
<tr><td>60 h.</td><td>50 h.</td></tr>
<tr><td colspan="2">Type of control: Current and final modular control, exam</td></tr>
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The subject of the study is the study of the efficacy and safety features of drugs in physiological and pathological conditions in patients with various diseases, taking into account the individual reactivity of the organism, the etiology and pathogenesis of the disease and the rules for prescribing prescriptions; a set of processes that occurs when drugs interact with biological systems (the human body or experimental animals); regularities between the chemical structure, physicochemical and quantum-chemical properties and the pharmacological action of drugs; the use of medicines for the treatment of patients and for prophylactic purposes.

Interdisciplinary relations: Pharmacology as an academic discipline:

a) is based on the study by students of medical biology, normal and pathological physiology, microbiology, medicinal chemistry, pharmacology, clinical disciplines, laboratory and functional diagnostics and integrates with these disciplines;

b) lays the foundations for the study of clinical disciplines by students, provides for the integration of teaching with these disciplines and the formation of skills to apply knowledge of clinical pharmacology in the process of further education and in professional activity;
c) lays the foundations for the formation of ideas about the general principles of drug therapy for major diseases and their individual manifestations.

1. GOALS AND OBJECTIVES OF THE EDUCATIONAL DISCIPLINE

1.1. Goal teaching the discipline "Pharmacology" follows from the goals of the educational and professional training program for applicants for the second educational (master's) level of higher education and are determined by the content of those systemic knowledge and skills that a doctor must master. The knowledge that students receive in the academic discipline "Pharmacology" is basic for the block of disciplines that provide natural science and vocational training.

1.2. The main tasks of studying the discipline "Pharmacology" are: providing students with theoretical knowledge on determining the group affiliation of drugs, their pharmacokinetics, pharmacodynamics, manifestations of possible adverse reactions, symptoms of overdose, measures to prevent the occurrence and help eliminate unwanted reactions, the main indications for prescribing and interacting with other drugs and the acquisition of practical skills, in in particular, writing prescriptions for drugs in various dosage forms.

1.3. Competencies and learning outcomes, the formation of which is facilitated by the discipline "Pharmacology"

According to the requirements of the higher education standard, the discipline "Pharmacology" provides the acquisition of the following **competencies:**

Integral:

- The ability to solve typical and complex specialized tasks and practical problems in professional activities in the field of health care, or in the learning process, involves research and / or innovation and is characterized by the complexity and uncertainty of conditions and requirements.

General:

- ability for abstract thinking, analysis and synthesis;
- the ability to learn and master modern knowledge;
- the ability to apply knowledge in practical situations;
- knowledge and understanding of the subject area and understanding of professional activities;
- the ability to make informed decisions;
- skills in the use of information and communication technologies;
- certainty and perseverance in the assigned tasks and responsibilities.

Special (professional, subject):

- the ability to determine the nature of nutrition in the treatment of diseases.
- the ability to determine the principles and nature of the treatment of diseases.
- the ability to determine the tactics of providing emergency medical care.
- ability to maintain medical records.

Competence matrix

№	Competence	Knowledge	Skills	Communication	Autonomy and responsibility
Integral competence					
The ability to solve typical and complex tasks and practical problems in the professional activity in the field of health care, or in the learning process, involves research and / or the implementation of innovations and is characterized by the complexity and uncertainty of conditions and requirements.					
General competences					

1	Ability to apply knowledge human pharmacology in practical situations	Have specialized conceptual knowledge acquired in the learning process	To be able to solve complex tasks and problems arising in professional activity	It is clear and unambiguous communication of one's own conclusions, knowledge and explanations, which are justified by specialists and non-specialists	Responsible for making decisions in difficult conditions
2	Knowledge and understanding of the subject area of human pharmacology	Have in-depth knowledge of the structure of professional activity	Be able to carry out professional activities, needs updating and integration of knowledge	The ability to effectively form a communication strategy in professional activity	Be responsible for development, the ability to further vocational training with a high level of autonomy
3	Ability to choose a communication strategy, ability to work in a team, interpersonal skills	Know tactics and communication strategies, laws and methods of communicative behavior	Be able to choose communication methods and strategies to ensure effective teamwork	Use communication strategies and interpersonal skills	Be responsible for the choice and tactics of communica tion
4	Ability for abstract thinking, analysis and synthesis, ability to learn and be modernly trained	Know the ways of analysis, synthesis and further modern education	Be able to analyze information, make informed decisions, be able to obtain modern knowledge	Make appropriate connections to achieve goals	Be responsible for the timely acquisition of modern knowledge
5	Skills in using information and communication technologies	Have in-depth knowledge of information and communication technologies used in professional activities	To be able to use information and communication technologies in the professional industry needs updating and integration of knowledge.	Use information and communication technologies in professional activities	Be responsible for the development of professional knowledge and skills.
6	Ability to evaluate and ensure the quality of work performed	Know methods for assessing performance indicators	Be able to provide quality work	Make connections to ensure quality work is done	Be responsible for quality execution works
7	Certainty and persistence in the tasks and responsibilities taken	Know the responsibilities and ways to accomplish the assigned tasks	Be able to define goals and objectives; be persistent and conscientious in the performance of duties	Establish interpersonal connections to effectively complete tasks and responsibilities	Be responsible for high-quality performance of the assigned tasks
Special (professional, subject) competencies					

1	The ability to determine the principles and nature of the treatment of diseases.	Know the leading clinical symptoms and syndromes (according to list 1); according to standard methods, using the preliminary data of the patient's history, the patient's examination data, knowledge about the person, his organs and systems, establish a probable nosological or syndromic preliminary clinical diagnosis of the disease (according to list 2)	Determine the nature of treatment (conservative, operative) of the disease (according to list 2), in the conditions of a healthcare institution, at the patient's home and at the stages of medical evacuation, incl. when, in the field, on the basis of a preliminary clinical diagnosis, using knowledge about a person, his organs and systems, adhering to the relevant ethical and legal norms, by making an informed decision on the existing algorithms and standard schemes.	It is clear and unambiguous communication of one's own conclusions, knowledge and explanations on this issue	Be responsible for quality work done
2	The ability to determine the nature of nutrition in the treatment of diseases	Know the role and characteristics of nutrition in the treatment of diseases	Be able to correctly pick up adequate methods nutrition in the treatment of diseases	To characterize the features of the course of diseases and the influence of the nature of nutrition on the course of diseases	Be responsible for making a decision when choosing the nature of food in the treatment of diseases.
3	Ability to determine the tactics of providing emergency medical care	Know the tactics of providing emergency medical care	Be able to correctly to determine the principles of providing emergency medical care (according to list 2), in the conditions of a healthcare institution, at the patient's home and at the stages of medical evacuation, incl. when, in the field, on the basis of a preliminary clinical diagnosis, using knowledge about a person, his organs and systems, adhering to the relevant ethical and legal norms, by making an informed decision on existing algorithms and standard schemes. be able to correctly pick up pharmacological preparations during emergency medical care	Establish links for discussion when choosing pharmacologica l drugs	Be responsible for making a decision when the choice of pharmacological preparations.

4	Ability to maintain medical records	Have specialized knowledge of medical records	Be able to write prescriptions correctly	Clearly and understandably justify the choice of a drug for treatment, inform the patient about the rule of taking the medicine	Be responsible for the correct maintenance of medical records

- ***Learning outcomes:***

- Integrative learning outcomes, the formation of which is facilitated by the academic discipline:

- "Pharmacology" as an academic discipline lays the foundation for the formation in the future of the following programmatic learning outcomes in accordance with the Standard of Higher Education of Ukraine for training specialists of the second (master's) level of the specialty 222 Medicine:

1. Establish the most probable or syndromic diagnosis of the disease (according to list 2) and prescribe laboratory and / or instrumental examination of the patient.

2. To plan measures to prevent the spread of infectious diseases, to detect and early diagnose infectious diseases (according to list 2).

3. To identify risk factors for the onset and course of the disease.

4. Determine negative environmental factors. To assess the impact of socio-economic and biological determinants on the health of an individual, family, population.

5. Observe a healthy lifestyle, use the means of self-regulation and self-control. ***Learning outcomes for the discipline:***

Upon completion of the study of the discipline "Pharmacology" students must

know:

- *Basic rules of pharmacotherapy;*
- *The main ways of pharmacological correction of diseases, dysfunctions of organs and systems.*
- *Nomenclature and classification of medicines.*
- *Pharmacological characteristics of essential medicines.*
- *Indications and contraindications for the use of medicines;*
- *The problem of drug resistance, including multi-drug drug resistance;*
- *Indications for genetic tests performed with the aim of individualizing pharmacotherapy;*
- *Manifestations of possible adverse reactions of drugs, symptoms of overdose with potent and poisonous drugs, methods of their prevention and principles of treatment.*
- *Basic directions of therapy development, in particular the possibilities of cellular, gene and targeted therapy in specific disease;*
- *Basic concepts of general toxicology;*
- *Basic principles of diagnostic procedures in poisoninh;*
- *Groups of medicines, the abuse of which can lead to poisoning;*
- *Symptoms of the most common acute poisoning, including alcohol, drugs and other psychoactive substances, heavy metals and selected groups of drugs;*
- *Rules for writing prescriptions for drugs in various dosage forms in accordance with modern Ukrainian legislation.*

be able to:

- *Write out and analyze prescriptions for medicines in various dosage forms in accordance with the modern legislation of Ukraine.*
- *Assess toxicological hazards in specific age groups and in conditions of hepatic and renal failure, and prevent drug poisoning.*
- *Use pharmaceutical guides and databases on medicinal products.*
- *Determine the group affiliation of medicines according to modern classifications.*
- *Provide pharmacological characteristics to drugs, it is logical to link the mechanism of action with pharmacodynamics, pharmacodynamics to indications, and side effects with contraindications to their use.*
- *Prepare records of all forms of prescription medicinal substances.*

- *Design schemes of rational chemotherapy of infections, empirical and targeted ones.*
- *Perform simple pharmacokinetic calculations.*
- *Calculate a single dose of the drug depending on the age, body weight or body surface area of the patient;*
- *To determine, depending on the characteristics of the pharmacokinetics of drugs, the frequency of taking the drug, its daily, course dose in patients of different ages in accordance with concomitant diseases and the use of other drugs;*
- *Justify an adequate dosage form in accordance with the route of administration*
- *Predict the consequences of the interaction of drugs with their combined administration, drugs and food components, drugs and alcohol;*
- *Assess the benefit / risk ratio of medicinal products;*
- *Make judgments about the possibility of adverse drug reactions in order to prevent them;*
- *To determine the manifestations of possible adverse reactions of drugs, symptoms of overdose with potent and poisonous drugs, methods of their prevention and principles of treatment;*
- *Interpret the results of toxicological tests.*
- *Create an algorithm for helping patients with acute drug poisoning with the use of antidotes in each case;*
- *Analyze pharmacological information in modern reference books, scientific and professional periodicals;*
- *Select drugs at appropriate doses in order to correct pathological phenomena in the system and in individual organs.*
- *Provide comparative characteristics of medicinal products in terms of efficacy, safety, mechanism of action, indications for use, etc.*

is ready to:

- *Promote health-promoting behavior.*
- *Perceive and recognize own limitations and self-assessing educational deficits and needs.*
- *Use objective sources of information.*

2. INFORMATION VOLUME OF THE EDUCATIONAL DISCIPLINE

210 hours of 7.0 ECTS credits are for the study of the academic discipline, incl. lectures 30 hours, practical 70 hours, independent work 110 hours.
Normative discipline.

The program of the discipline is structured into 2 modules:

Module 1. "Medical prescription. General pharmacology. Drugs affecting the nervous and cardiovascular systems"

Submodule 1. Medical prescription. General pharmacology.
Submodule 2. Drugs that affect the peripheral nervous system.
Submodule 3. Drugs that affect the functions of the central nervous system. Psychotropic drugs.
Submodule 4. Pharmacology of drugs that affect the cardiovascular system.

Module 2. "Medicines affecting the functions of organs, systems and metabolism. Chemotherapy drugs. Antidotes. "

Submodule 5. Medicines affecting the respiratory system, gastrointestinal tract, kidney function and reproductive processes, blood function.
Submodule 6. Medicines affecting metabolism.
Submodule 7. Chemotherapy drugs.
Submodule 8. Antidotes. Preparations of macro- and microelements. Plasma substitutes and preparations for parenteral nutrition.

Module 1. Medical prescription. General pharmacology. Medicines affecting the nervous and cardiovascular system.

Content module I. Medical recipe. General pharmacology

Topic. Introduction to medical prescription. Solid, soft and liquid dosage forms. Forms for injection.

Learning objectives:

Summarize and analyze the main methods of making medicines.

To classify dosage forms. To classify solid, soft, liquid dosage forms and forms for injection. To interpret the differences between individual solid, soft, liquid dosage forms, the rules of prescribing official and bulk solid dosage forms.
To interpret the differences between injectable forms, prescription rules for formal and bulk sterile dosage forms.
To make judgments about the rules for writing out prescriptions in expanded and abbreviated form.
To make judgments about the possibility of side effects when using various solid, soft, liquid dosage forms and forms for injection and ways to prevent them.
To write prescriptions for solid, soft, liquid dosage forms and forms for injection.

Topic . Non-dosage forms

Learning objectives:

To summarize and analyze the main methods of making powders, solutions for external use, ointments, pastes, plasters, liniment.
To classify non-dose dosage forms.
Summarize the differences in the extract and the rules for prescribing ointments, pastes, and liniment.
To interpret the differences between certain types of underdosing dosage forms, the rules of prescribing by official and main underdosing dosage forms.
To make judgments about the rules for writing out prescriptions in expanded and abbreviated form.
To write prescriptions for all types of underdosing dosage forms.

Topic . Control of practical skills accordantly to general prescription.

Learning objectives:

Summarize knowledge from the characteristics of dosage and under-dosage forms.
To know the classification of dosage and under-dosage forms.
To summarize the differences in the prescription and the rules for prescribing metered and underdosing dosage forms.
To interpret the differences between individual types of dosage forms, the rules for prescribing official and main dosage forms.
To iake judgments about the rules for writing out prescriptions in expanded and abbreviated form. To write prescriptions for all types of dosage and under-dosage forms.

Topic . General pharmacology. Control of practical skills of ability to use modern directories of medicines.

Learning objectives:

To generalize knowledge about the place of pharmacology among other sciences and the contribution of domestic and foreign scientists to its development (Cherkes A.I., Anichkov S.V., Trinus F.P., Komissarov I.V.).
To know the routes of drug administration, the mechanism of their absorption, transport through membranes, barriers, distribution in the body.
To summarize the differences in the transformation of drugs in the body and the mechanisms of their excretion from the body.
To interpret the relationship between the characteristics of the pharmacokinetics of drugs and their pharmacological effects.
To make a judgment about the main pharmacokinetic parameters in the description of drugs.
To have an idea of the general mechanisms of action of drugs, mediators, principles of pharmacological classification.
To summarize the difference between the types of action of drugs, types of interaction of drugs with receptors.
To interpret the relationship between the elements of the chemical structure of drugs and the types of mediators. To make judgments about the main pharmacokinetic parameters in the description of drugs. To solve test tasks and situational tasks.

Submodule №2. Drugs that affect the peripheral nervous system

Topic. Drugs that affect the transmission of excitation in cholinergic synapses.

Learning objectives:

To generalize and analyze the pharmacological characteristics of the main pharmacological agents of cholinomimetic and anticholinergic action, to explain the mechanisms of action.
To interpret the indications for the use of drugs with cholinomimetic and anticholinergic action in accordance with knowledge of pharmacodynamics.

To assess the benefit / risk ratio when using drugs with cholinomimetic and anticholinergic action.
To create an algorithm for helping patients with acute poisoning with muscarine, anticholinesterase drugs, atropine-like substances. To understand the possibility of using antidotes in specific cases.
To explain the dependence of the action of cholinomimetic and anticholinergic drugs on the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy.
To make a judgment on the possibility of side effects of cholinomimetic and anticholinergic drugs in order to prevent them.
To conduct a pharmacotherapeutic analysis of the prescribed drugs of cholinomimetic and anticholinergic action.

Topic. Medicines affecting the transmission of excitation in adrenergic synapses. Test control from content modules 1-2.

Learning objectives:

To summarize and analyze the pharmacological properties of the main adrenomimetic and antiadrenergic drugs, explain the mechanism of their action.
To classify sympathomimetics and antiadrenergic drugs, according to their effect on certain types of adrenergic receptors.
To interpret indications for the use of drugs in accordance with knowledge of pharmacodynamics.
To assess the benefit / risk ratio when using drugs acting in the area of adrenergic synapses.
To explain the dependence of the action of drugs that affect adrenergic receptors on the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy.
To analyze possible factors that may contribute to the occurrence of drug side effects in order to prevent them.
To conduct a pharmacotherapeutic analysis of prescriptions for drugs that affect the transmission of excitation in adrenergic synapses.

Submodule №3. Drugs that affect the functions of the central nervous system. Psychotropic drugs

Topic . Medicines for general and local anesthesia

Learning objectives:

To determine the group affiliation of anesthetic drugs.
To provide for changes in body functions under the influence of anesthetics and ethyl alcohol in accordance with their pharmacodynamics and pharmacokinetics (in therapist. And toxin. Doses).
To interpret indications for the use of anesthetic drugs in accordance with the knowledge of Pharmacodynamics. To assess the benefit / risk ratio of using drugs that induce anesthesia.
To make a judgment about the possibility of side effects of the studied drugs in order to prevent them.
To consider the priority of domestic science for the introduction of local anesthetics (cocaine, novocaine) into medical practice (works by V.K. Anrep), issues of cocaine and other types of drug addiction.
To determine the group affiliation of drugs that depress and excite the sensitive nerve endings of the afferent nerves.
To rovide for changes in body functions under the influence of anesthetic, astringent, enveloping, adsorbing and irritating drugs in accordance with their pharmacodynamics and pharmacokinetics (in therapeutic and toxic doses).
To consider the structure of the afferent part of the peripheral nervous system, the mechanisms of action of bitterness in the light of the robot laboratory of I.P. Pavlov.
To interpret the indications for the use of these medicines in accordance with the knowledge of Pharmacodynamics. To pay attention to the importance of these groups of drugs in the treatment of gastrointestinal pathology, allergies (especially in children) and the modern version of painless surgery.
To assess the benefit / risk ratio when using drugs that cause anesthesia, astringent, enveloping, adsorbent and irritant effects.
To make judgments about the side effects of the investigational agents in order to prevent them.
To write prescriptions and conduct a pharmacotherapeutic analysis of prescribed drugs that cause anesthesia and are used to treat alcoholism; suppress and excite the sensitive nerve endings of the afferent nerves.
To carry out experimental work and explain the results obtained.

Topic . Analgesics.

Specific goals:

T0 summarize and analyze the pharmacological properties of the main opiate and non-opiate analgesics, explain the mechanism of their action.
To classify opiate and non-opiate analgesics by chemical structure, origin and affinity for opiate receptors.
To interpret indications for the use of drugs in accordance with knowledge of pharmacodynamics.
To assess the benefit / risk ratio when using analgesics.
To explain the features of drug dependence, arises in opiate analgesics, clinical manifestations.
To explain the dependence of the action of drugs that inhibit COX on the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy. To analyze the concept of withdrawal symptoms, treatment methods. Drug addiction as a socio-biological problem.
To write and analyze prescriptions for pharmacological preparations, adequately restores the impaired function of the nocic and antinociceptive systems.

Topic . Antipsychotics, tranquilizers, hypnotics and sedatives

Specific goals:

To summarize and analyze the pharmacological properties of the main psychotropic drugs with deprimating action.
To classify neuroleptic drugs by chemical structure, origin and effects on the spectrum of receptor action.
To classify tranquilizers by chemical structure, to determine the features of the mechanism of action.
To classify and interpret indications for hypnotics and sedatives.
To interpret indications for the use of psychotropic drugs with a deprimating effect according to knowledge of pharmacodynamics.
To interpret the mechanism of action and indications for the appointment of lithium preparations.
To evaluate the benefit / risk ratio when using psychotropic drugs with a depressing effect.
To explain the features of the side effects of psychotropic drugs with depressing action.
To write and analyze prescriptions for pharmacological preparations, adequately establish a disturbed psychoemotional state.

Topic . Anticonvulsants. Medicines for the treatment of neurodegenerative diseases.

Learning objectives:

To be able to determine the group belonging of antiepileptic and antiparkinsonian drugs. To provide for changes in the functions of the central nervous system under the influence of antiepileptic and antiparkinsonian drugs in accordance with their pharmacodynamics and pharmacokinetics (in therapeutic and toxic doses).
To choose adequate means of treating disorders of various forms of epilepsy, parkinsonism.
To make a judgment about the possibility of side effects of the studied drugs in order to prevent them.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed antiepileptic and antiparkinsonian drugs.

Topic. Antidepressants. Nootropic drugs. Psychotropic stimulants and analeptics.

Learning objectives:

To analyze the pharmacological characteristics of antidepressants.
To classify antidepressants, nootropics by mechanism of action and chemical structure. To explain the features of the pharmacodynamics of the neuron monoamine uptake inhibitors of indiscriminate and selective action; comparative characteristics of non-selective and irreversible monoamine oxidase (MAO) inhibitors and selective and reverse MAO inhibitors.
To summarize and analyze the main ways of pharmacological correction of a decrease or depression of the central nervous system.
To generalize and analyze the pharmacological characteristics of psychotropic stimulants and analeptics, to explain the mechanisms of action.
To interpret indications for prescription, taking into account the characteristics of the comparative action of drugs and interchangeability, the rate of development of the therapeutic effect and the principles of drug withdrawal;
To make judgments about possible side effects of antidepressants, nootropic drugs, psychotropic stimulants and analeptics in order to prevent them.
To analyze the pharmacological characteristics of nootropics, drugs that affect cerebral circulation and for the treatment of migraine, explain their mechanisms of action.
To interpret the indications for the appointment of nootropics, agents affecting cerebral circulation and for the treatment of migraine in accordance with knowledge of pharmacodynamics.

To generalize and analyze the pharmacological characteristics of adaptogens (general tonic agents), sources of their production (from plants and animals).
To assess the benefit / risk ratio when using antidepressants, nootropics, adaptogens, psychotropic stimulants and analeptics.
To know the algorithm for helping patients with acute poisoning with caffeine and analeptics.
To write prescriptions for antidepressant drugs, nootropic drugs, adaptogens, psychotropic stimulants and analeptics and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Submodule №4. Pharmacology of agents affecting the function of the cardiovascular system.

Topic. Cardiotonic and antiarrhythmic drugs.

Specific goals:

To summarize and analyze the pharmacodynamics and pharmacokinetics of cardiotonic and antiarrhythmic drugs.
To interpret indications for the use of cardiotonic and antiarrhythmic drugs in accordance with knowledge of pharmacodynamics.
To assess the benefit / risk ratio when using cardiotonic and antiarrhythmic drugs.
Create an algorithm for helping patients with intoxication with cardiac glycosides, explain the principle of antidote action.
To explain the dependence of the action of cardiotonic and antiarrhythmic drugs on the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy.
To make a judgment about the possibility of side effects when using cardiotonic and antiarrhythmic drugs and ways to prevent them.
To write prescriptions for cardiotonic and antiarrhythmic drugs and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Topic . Antianginal drugs (drugs that are used to treat patients with coronary heart disease). Lipid-lowering drugs.

Learning objectives:

To summarize and analyze the pharmacological characteristics of the main pharmacological agents, explain the mechanisms of action of individual groups of drugs (nitrates, blockers, calcium antagonists, myotropic vasodilators, reflex drugs, hypolipidemic and hypocholesterolemic agents).
To interpret indications for the use of antianginal and antiatherosclerotic drugs in accordance with knowledge of pharmacodynamics.
To assess the benefit / risk ratio when using antianginal drugs that affect the smooth muscles of the coronary vessels and the general vasculature. To create an algorithm for helping patients in case of overdose with antianginal drugs. Side effects of antianginal drugs and their elimination. To understand the possibility of using antidotes in each case.
To explain the dependence of the action of antianginal drugs that affect vascular smooth muscle and smooth muscle organs and hypocholesterolemic drugs that affect lipid metabolism and the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy.
To make judgments about the possibility of side effects of drugs in order to prevent and eliminate side effects.
To write and analyze prescriptions for antianginal and hypolipidemic drugs

Topic. Antihypertensive drugs. Angioprotectors.

Learning objectives:

To summarize and analyze the pharmacological characteristics of the main pharmacological agents, explain the mechanisms of action of individual groups of drugs (adrenergic receptor blockers, ganglion blockers, angiotensin and ACE receptor blockers, antihypertensive drugs of myotropic action, sympatholytics).
To interpret indications for the use of antihypertensive drugs in accordance with knowledge of pharmacodynamics.
To assess the benefit / risk ratio when using drugs with hypo- and hypertensive action that affect the peripheral and central parts of the nervous system, as well as vascular smooth muscles.
To create an algorithm for helping patients in case of overdose with hypertensive drugs. Side effects of antihypertensive drugs and their elimination. To understand the possibility of using antidotes in each case.
To explain the dependence of the action of hyper- and antihypertensive drugs that affect the peripheral nervous system and the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy.
To make judgments about the possibility of side effects of drugs in order to prevent and eliminate side effects.

To write and analyze prescriptions for drugs with hypertensive and antihypertensive action (alpha and beta adrenomimetics, sympathomimetics, alpha and beta adrenergic blockers, ACE inhibitors, calcium channel blockers).

Topic . FMC 1.

Learning objectives:

To be able to prescribe medicines in any dosage form. Determine the methods and ways of writing dosage forms.

To determine the general principles of pharmacokinetics and pharmacodynamics of drugs.

To determine the pharmacological effects, indications and contraindications, the dosage regimen of agents that affect the afferent, efferent and central nervous systems and affect the cardiovascular system.

To determine the pharmacological effects, indications and contraindications for the use of drugs that affect the afferent, efferent and central nervous systems and affect the cardiovascular system.

To be able to classify the drugs that affect the afferent, efferent and central nervous systems and affect the cardiovascular system.

To analyze the action, indications and contraindications for the use of drugs that affect the afferent, efferent and central nervous systems and affect the cardiovascular system.

To analyze the pharmacokinetics and pharmacodynamics of drugs that affect the afferent, efferent and central nervous systems and affect the cardiovascular system.

Module 2: Medicines affecting the functions of organs, systems and metabolism. Chemotherapy drugs. Antidotes.

Submodule №5. Medicines affecting the respiratory system, gastrointestinal tract, kidney function and reproductive processes, blood function.

Topic . Drugs that affect the respiratory system.

Learning objectives:

To classify drugs that affect the respiratory system.

To assess the possibilities of their use for pharmacotherapy of various pathological conditions of the respiratory system.

To explain the mechanisms of action of drugs in each group.

To interpret indications for the use of drugs according to knowledge of their pharmacodynamic and pharmacokinetic characteristics. To create an algorithm for ambulance patients, using analeptics for respiratory depression against the background of poisoning (drugs, hypnotics, carbon monoxide, etc.), bronchodilators for attacks of bronchial asthma and defoamers and decongestants for pulmonary edema.

To explain the dependence of the action of drugs affecting the respiratory system on the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and drug administration routes.

To make judgments about the possibility of side effects of drugs in order to prevent them.

To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Topic . Drugs that affect the gastrointestinal tract.

Learning objectives:

To summarize and analyze the pharmacological characteristics of agents affecting the function of the digestive system, to explain the mechanisms of action.

To assess the benefit / risk ratio when using drugs that affect the function of the digestive system.

To create an algorithm for the complex treatment of gastric ulcer and duodenal ulcer, hyperacid gastritis.

To explain the dependence of the action of drugs that affect the digestive system on their pharmacokinetic parameters, the features of the action in patients of different ages, in the presence of concomitant diseases and their pharmacotherapy.

To be able to predict the occurrence of side effects of drugs in order to prevent them.

To write and analyze prescriptions for drugs acting on the digestive system.

Topic. Drugs that affect the gastrointestinal tract (continued).

Learning objectives:

To summarize and analyze the pharmacological characteristics of agents affecting the function of the digestive system, to explain the mechanisms of action.

To determine the algorithm for providing assistance in acute and chronic pancreatitis, constipation and diarrhea.

To determine the indications for the use of enzyme, choleretic drugs.

To determine indications for the use of hepatoprotectors, probiotics.

To be able to predict the occurrence of side effects of drugs in order to prevent them.
To write and analyze prescriptions for drugs acting on the digestive system.

Topic . Drugs that affect kidney function and reproductive processes.

Learning objectives:

To classify diuretics by chemical structure, localization of action in different parts of the nephron, activity and mechanism of action.
To classify anti-gout medicines.
To classify medicinal products that affect reproductive processes.
To explain the mechanisms of action of drugs in each group.
To interpret indications for the use of drugs according to knowledge of their pharmacodynamic and pharmacokinetic characteristics. To create an algorithm for an ambulance for patients using diuretics (for poisoning, for edema, hypertension).
To make judgments about the possibility of side effects of drugs in order to prevent them.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Topic . Drugs that affect hemostasis.

Learning objectives:

To summarize and analyze the pharmacological properties of drugs that affect blood clotting, fibrinolysis and platelet aggregation.
To interpret indications for the use of drugs in accordance with knowledge of pharmacodynamics.
To assess the benefit / risk ratio of using drugs that affect blood clotting, fibrinolysis and platelet aggregation.
To make judgments about the possibility of side effects of drugs in order to prevent them.
To create an algorithm for helping patients with overdose with drugs that affect blood clotting.
To write prescriptions for drugs that affect blood clotting, fibrinolysis and platelet aggregation and conduct their pharmacotherapeutic analysis.

Topic . Drugs that affect hematopoiesis. Antineoplastic drugs.

Learning objectives:

To analyze and summarize modern directions of pharmacological correction of disorders in the formation of blood corpuscles and the process of blood coagulation.
To get acquainted with the classifications of medicines that affect the blood system.
To carry out the pharmacological characterization of agents that affect the blood system.
To explain the features of the action and use of drugs that affect the blood system, depending on their pharmacokinetics, age of patients, the presence of concomitant diseases, concomitant pharmacotherapy.
To make a judgment about the possibility of side effects of drugs that affect the blood system.
To know the classification and general characteristics of antineoplastic agents.
To be able to prevent complications of chemotherapy.
To write prescriptions and make a pharmacotherapy analysis of the prescribed drugs acting on the blood system and anti-tumor action.

Submodule 6. Medicines affecting metabolism.

Topic. Water-soluble vitamin preparations. Enzymes and antienzymes.

Learning objectives:

To explain the difference between vitamins and vitamin preparations, give a definition.
To classify the vitamin preparation according to its biological role, chemical structure and solubility.
Pharmacology of vitamin preparations, their mechanisms of action, indications, side effects.
To create an algorithm for helping patients with possible poisoning by certain vitamin preparations.
Understand the effect of antidote therapy for these poisonings. Antivitamins.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Topic . Fat-soluble vitamin preparations.

Learning objectives:

To explain the difference between natural vitamins and vitamin preparations, give a definition.
To characterize fat-soluble vitamin preparations, indications for their use and side effects.
To create an algorithm for helping patients with possible poisoning by certain vitamin preparations.
Understand the action of antivitamins.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Topic . Hormonal drugs (peptide structure), their synthetic substitutes and antagonists.

Learning objectives:

To classify hormonal drugs by origin.

To analyze the pharmacokinetics, pharmacodynamics of hormonal preparations of the hypothalamus and pituitary gland. Know their side effects, indications and contraindications for use.
To analyze the pharmacokinetics, pharmacodynamics of thyroid hormones. Side effects, indications and contraindications for use.
Characteristics of antithyroid drugs. Indications and contraindications for use. To analyze the pharmacokinetics, pharmacodynamics of calcitrin. Determine the indications and contraindications for its use.
To analyze the pharmacokinetics and pharmacodynamics of insulin, side effects, indications and contraindications for use.
Pharmacokinetics, pharmacodynamics, side effects of synthetic antidiabetic drugs. Indications and contraindications for use.
To learn the principles of care for hypoglycemic and hyperglycemic insects.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Topic. Hormonal drugs (steroid structure), their synthetic substitutes and antagonists.

Learning objectives:

To know the classification and characteristics of gluco- and mineralocorticoid drugs. To learn the side effects, indications and contraindications for their use.
To know the classification and characteristics of sex hormone drugs. Side effects, indications and contraindications for use.
To master the action and indications of anabolic steroids and non-steroidal anabolic drugs. To analyze side effects, indications and contraindications for their use. To learn the principles of prescribing hormonal drugs in emergencies. To write prescriptions and conduct a pharmacotherapeutic analysis.

Topic. Anti-inflammatory, anti-allergic and immunotropic drugs.

Learning objectives:

To know the classification and pharmacology of non-steroidal anti-inflammatory drugs. To master the mechanisms of action, side effects, indications and contraindications for use.
To know the classification and pharmacology of non-steroidal anti-inflammatory drugs. To master the mechanisms of action, side effects, indications and contraindications for use.
To know the classification and characteristics of anti-allergic drugs. To master the mechanisms of di, side effects, indications and contraindications for use.
To know the classification and characteristics of immunotropic drugs. To master the mechanisms of action, side effects, indications and contraindications for use.
To master the principles of prescribing medicines for inflammatory processes, allergies, and disorders of the immune system.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs.

Submodule 7. Chemotherapy drugs.

Topic. Antiseptic and disinfectant drugs.

Learning objectives:

To summarize and analyze the pharmacological characteristics of the main pharmacological agents, explain the mechanisms of action.
To interpret indications for the use of disinfectants and antiseptics in accordance with pharmacodynamic knowledge.
To assess the benefit / risk ratio when using the main groups with disinfectants and antiseptics.
To create an algorithm for helping patients with acute poisoning with acids, alkalis, heavy metal compounds.
To understand the possibility of using antidotes in each case.
To explain the dependence of the action of disinfecting and antiseptic drugs on the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy.
To make judgments about the possibility of side effects when using disinfectants and antiseptics in order to prevent them.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs from the group of disinfecting and antiseptic drugs.

Topic. Antiseptic and disinfecting drugs (continued).

Learning objectives:

To summarize and analyze the pharmacological characteristics of the main pharmacological agents, explain the mechanisms of action.

To interpret indications for the use of disinfectants and antiseptics in accordance with pharmacodynamic knowledge.
To assess the benefit / risk ratio when using the main groups with disinfectants and antiseptics.
To create an algorithm for helping patients with acute phenol poisoning. Understand the possibility of using antidotes in each case.
To explain the dependence of the action of disinfecting and antiseptic drugs on the characteristics of pharmacokinetics in patients of different ages, concomitant diseases and their therapy.
To make judgments about the possibility of side effects when using disinfectants and antiseptics in order to prevent them.
To write prescriptions and conduct a pharmacotherapeutic analysis of the prescribed drugs from the group of disinfecting and antiseptic drugs.

Topic. Synthetic antimicrobial drugs. Antimycotic drugs.

Learning objectives:

To summarize and analyze the main characteristics of fluoroquinolones, sulfonamides, antifungal agents.
To interpret modern classifications of medicines used to treat diseases caused by pathogenic agents.
To summarize and analyze the pharmacological characteristics of fluoroquinolones, sulfonamides, antifungal agents, explain the mechanism of action.
To assess the balance of benefits and risks when using fluorinated quinolones and other synthetic chemotherapeutic agents, antifungal agents. Predict and prevent side effects.
To make a pharmacotherapeutic analysis of drugs from the group fluoroquinolones, sulfonamides and antifungal agents.

Topic. Pharmacology of beta-lactam antibiotics.

Learning objectives:

To summarize and analyze the main characteristics of antibiotics.
To interpret modern classifications of antibiotics.
To summarize and analyze the pharmacological characteristics of the main antibiotics, explain the mechanism of action. To create a rational combination of antibiotic use for various diseases and be able to substantiate it theoretically.
To assess the benefit / risk ratio of antibiotic use. Predict and prevent side effects.
To write prescriptions and conduct a pharmacotherapeutic analysis of drugs from the antibiotic group.

Topic. Pharmacology of antibiotics of different groups.

Learning objectives:

To summarize and analyze the main characteristics of antibiotics.
Interpret modern classifications of antibiotics.
To summarize and analyze the pharmacological characteristics of the main antibiotics, explain the mechanism of action. To create a rational combination of antibiotic use for various diseases and be able to substantiate it theoretically.
To assess the benefit / risk ratio of antibiotic use. Predict and prevent side effects.
To write prescriptions and conduct a pharmacotherapeutic analysis of drugs from the antibiotic group.

Topic. Anti-tuberculosis drugs. Antispirochetal and antiviral drugs.

Learning objectives:

To summarize the basic principles of prescribing anti-tuberculosis, antiviral and anti-syphilitic drugs.
To explain the mechanisms of action of anti-tuberculosis, antiviral and anti-syphilitic drugs.
To analyze the principles of classification of anti-tuberculosis, antiviral and anti-syphilitic drugs.
To interpret the indications for use and the need for combined administration of anti-tuberculosis, antiviral and anti-syphilitic drugs.
To assess side effects and explain the need for rational replacement of drugs in the treatment of tuberculosis, viral infections and syphilis.
To explain the origin of the side effects of anti-tuberculosis, antiviral and anti-syphilitic drugs and know how to prevent them.
To write prescriptions and make a pharmacotherapeutic analysis of the prescribed anti-tuberculosis, antiviral and anti-syphilitic drugs.

Topic. Antiprotozoal drugs. Anthelmintic medicines.

Learning objectives:

To generalize and analyze modern classifications of medicines used to treat diseases caused by pathogenic agents.

To generalize and analyze the main antiprotozoal and anthelmintic drugs, explain the mechanisms of their action.
To propose a rational combination of antiprotozoal and anthelmintic drugs.
To create an algorithm for helping patients with acute poisoning with antiprotozoal and anthelmintic drugs.
To assess the benefit / risk ratio when using antiprotozoal and anthelmintic drugs. To predict and prevent side effects.
To make a pharmacotherapeutic analysis of the prescribed antiprotozoal and antihelminthic drugs.
Content module 8. Antidotes. Preparations of macro- and microelements. Plasma substitutes and preparations for parenteral nutrition.

Topic. Drugs of macro- and microelements. Plasma substitutes and preparations for parenteral nutrition.

Learning objectives:
To summarize and analyze the pharmacological characteristics of preparations of macro- and microelements, plasma substitutes and preparations for parenteral nutrition.
To interpret indications for the use of drugs in accordance with knowledge of pharmacodynamics.
To assess the side effects of drugs.
To analyze the indications for the use of hypotonic and hypertonic salt solutions.
Prescriptions and a pharmacotherapeutic analysis of the prescribed preparations of macro- and microelements, plasma substitutes and preparations for parenteral nutrition.

Topic . Principles of treatment of acute drug poisoning. Antidotes.

Learning objectives:
To summarize and analyze the basic principles of pharmacotherapy of acute drug poisoning and the causes of acute poisoning.
To interpret the symptoms of poisoning with various substances.
To know the pharmacological characteristics of drugs used in emergency conditions.
To create an algorithm for helping patients with poisoning.
To analyze prescriptions for antidotes.
Prescriptions and a pharmacological analysis of the prescribed drugs used to treat acute poisoning.

3. STRUCTURE OF THE TRAINING DISCIPLINE

Names of content modules and topics	Number of hours					
	Day form					
	Total	Including				
		l	p	s	i	i.s.w
Module 1. Medical prescription. General pharmacology. Medicines affecting the nervous and cardiovascular system.						
Submodule 1: Medical formulation. General pharmacology						
Topic 1. Introduction to medical prescription. Solid, soft and liquid dosage forms. Forms for injection.		1	2			4
Topic 2. Non-metered dosage forms.		1	2			4
Topic 3. Control of practical skills in medical prescription.			2			4
Topic 4. General pharmacology. Control of practical skills of the ability to use modern reference books of medicines.		1	2			4
Submodule 2: Medicines affecting the peripheral nervous system						
Topic 5. Medicines affecting the transmission of excitation in cholinergic synapses.			2			4
Topic 6. Medicines affecting the transmission of excitation in adrenergic synapses. Test control for informative modules 1-2.			2			4
Submodule 3. Medicines affecting the functions of the central nervous system. Psychotropic drugs						
Topic 7. Medicines for general and local anesthesia.		1	2			4
Topic 8. Analgesics.			2			4
Topic 9. Antipsychotics, tranquilizers, hypnotics and sedatives.		1	2			4

Topic 10. Anticonvulsants. Medicines for the treatment of neurodegenerative diseases.		1	2			4
Topic 11. Antidepressants. Nootropic drugs. Psychotropic stimulants and analeptics.		1	2			4
Submodule 4. Pharmacology of drugs affecting the cardiovascular system.						
Topic 12. Antiarrhythmic drugs. Cardiotonic medicines. Cardiac glycosides.		1	2			4
Topic 13. Antianginal and hypolipidemic drugs.		1	2			4
Topic 14. Antihypertensive drugs. Angioprotectors. Test control for content modules 3-4.		1	2			4
Topic 15. Final modular control Control of practical training. Test control of theoretical training			2			4
Total for module I	**100**	**10**	**30**			**60**
Module 2. Medicines affecting the functions of organs, systems and metabolism. Chemotherapy drugs. Antidotes.						
Submodule 5. Medicines affecting the respiratory system, gastrointestinal tract, kidney function and reproductive processes, blood function						
Topic 1. Medicines affecting the respiratory system.		1	2			2
Topic 2. Medicines affecting the gastrointestinal tract.		1	2			2
Topic 3. Medicines affecting the gastrointestinal tract		1	2			2
(Continued)		1	2			2
Topic 4. Medicines affecting kidney function and reproductive processes.		1	2			2
Topic 5. Medicines affecting hemostasis.		1	2			2
Submodule 6. Medicines affecting metabolism						
Topic 7. Water-soluble vitamin preparations. Enzymes and antienzymes.		1	2			2
Topic 8. Fat-soluble vitamin preparations.		1	2			2
Topic 9. Hormonal drugs (peptide structure), their synthetic substitutes and antagonists.		1	2			2
Topic 10. Hormonal drugs (steroid structure), their synthetic substitutes and antagonists.		1	2			2
Topic 11. Anti-inflammatory, anti-allergic and immunotropic drugs. Test control for meaningful modules 5-6.		1	2			3
Submodule 7. Chemotherapy drugs						
Topic 12. Antiseptic and disinfectant medicines.		1	2			3
Topic 13. Antiseptic and disinfectant medicines (continued)		1	2			3
Topic 14. Synthetic antimicrobial drugs. Prothymic drugs.		1	2			3
Topic 15. Pharmacology of beta-lactam antibiotics.		1	2			3
Topic 16. Pharmacology of antibiotics of various groups.		1	2			3
Topic 17. Anti-tuberculosis drugs. Protyspirochetal funds. Antiviral drugs.		1	2			3
Topic 18. Antiprotozoal drugs. Anthelmintic medicines.		1	2			2
Submodule 8. Antidotes. Preparations of macro- and microelements. Plasma substitutes and preparations for parenteral nutrition						
Topic 19. Preparations of macro- and microelements. Plasma substitutes and preparations for parenteral nutrition. Test control for informative modules 7-8.		1	2			3
Topic 20. Principles of treatment of acute drug poisoning. Antidotes. Final semester certification. Final modular control Control of practical training. Test control of theoretical training.		1	2			4
Total for module II	**110**	**20**	**40**			**50**
Total hours	**210**	**30**	**70**			**110**

THEMATIC LECTURE PLAN

	The 5th semester	
	Module 1. "Medical prescription. General pharmacology. Medicines affecting the nervous and cardiovascular system "	
№	**Topic name**	**Hours**
1	General pharmacology. Pharmacokinetics, pharmacodynamics and basic mechanisms of action of drugs.	2
2	Side action of medicinal agents.	2
3	Cholinergic and adrenergic agonists and antagonists.	2
4	Pharmacology of drugs influencing on the CNS. Analgesics.	2
5	Antiarrhythmic and cardiotonic agents. Antianginal drugs.	2
	Module 2. Drugs that affect the functions of organs, systems and metabolism. Chemotherapeutic drugs. Antidotes.	
6	Drugs that affect the function of the digestive system.	2
7	Drugs that affect hemostasis.	2
8	Hormonal drugs.	2
9	Antidiabetic drugs.	2
10	Anti-inflammatory and anti-allergic drugs.	2
	Total	**20**
	The 6th semester	
№	**Topic name**	**Hours**
1	Antiseptics and disinfectant drugs.	2
2	Synthetic antimicrobial drugs. Antimycotics.	2
3	Pharmacology of beta-lactam antibiotics.	2
4	Pharmacology of antibiotics of different groups. Principles of rational antibiotic therapy.	2
5	Principles of treatment of acute drug poisoning. Antidotes.	2
	Total	**20**

5. THEMATIC PLAN OF PRACTICAL CLASSES

	The 5th semester	
№	**Topic name**	**Hours**
	Module 1. "Medical prescription. General pharmacology. Drugs affecting the nervous and cardiovascular systems"	
Submodule 1. Medical prescription. General pharmacology		
1	Introduction to the medical prescription. Solid dosage medical forms. Soft dosage medical forms. Medical forms for injections.	2
2	Non- dosage medicinal forms.	2

3	Control of practical skills accordantly to general prescription.	2
4	General pharmacology. Control of practical skills of ability to use modern directories of medicines.	2
Submodule 2. Drugs that affect the peripheral nervous system		
5	Drugs that affect the transmission of excitation in cholinergic synapses.	2
6	Drugs that affect the transmission of excitation in adrenergic synapses. Test control on content modules 1-2.	2
Submodule 3. Drugs that affect the functions of the central nervous system. Psychotropic drugs		
7	Medicines for general and local anesthesia.	2
8	Analgesics.	2
9	Neuroleptics, tranquilizers, hypnotics and sedatives.	2
10	Anticonvulsants. Drugs for the treatment of neurodegenerative diseases.	2
11	Antidepressants. Nootropic drugs. Psychotropic stimulants and analeptics.	2
Submodule 4. Pharmacology of drugs that affect the cardiovascular system.		
12	Antiarrhythmic drugs. Cardiotonic drugs. Cardiac glycosides.	2
13	Antianginal and hypolipidemic drugs. Angioprotectors.	2
14	Antihypertensive drugs. Test control on content modules 3-4.	2
15	Final modular control Control of practical training. Test control of theoretical training	2
	Module 2. "Medicines affecting the functions of organs, systems and metabolism. Chemotherapy drugs. antidotes "	
Submodule 5. Medicines affecting the respiratory system, gastrointestinal tract, kidney function and reproductive processes, blood function		
16	Drugs that affect the respiratory system.	2
17	Drugs that affect the gastrointestinal tract.	2
18	Drugs that affect kidney function and reproductive processes.	2
19	Drugs that affect hemostasis. Drugs that affect hematopoiesis. Antineoplastic drugs.	2
20	Diff.credit	2
	Total	**40**
	The 6th semester	
№	**Topic name**	**Hours**
Submodule 6. Medicines affecting metabolism		
1	Water-soluble vitamin preparations. Enzymes and antienzymes.	2
2	Fat-soluble vitamin preparations.	2
3	Hormonal drugs (peptide structure), their synthetic substitutes and antagonists.	2
4	Hormonal drugs (steroid structure), their synthetic substitutes and antagonists.	2
5	Anti-inflammatory, anti-allergic and immunotropic drugs. Test control for content modules 5-6.	2
Submodule 7. Chemotherapy drugs.		
6	Antiseptic and disinfectant drugs.	2
7	Antiseptic and disinfectant drugs. (contin.)	2
8	Synthetic antimicrobial drugs. Antimycotic drugs.	2

9	Pharmacology of beta-lactam antibiotics.	2
10	Pharmacology of antibiotics of different groups.	2
11	Anti-tuberculosis drugs. Anti-spirochaetosis means. Antiviral drugs.	2
12	Antiprotozoal drugs. Anthelminticdrugs.	2
Submodule 8. Antidotes. Preparations of macro- and microelements. Plasma substitutes and preparations for parenteral nutrition.		
13	Preparations of macro- and microelements. Plasma substitutes and preparations for parenteral nutrition. Test control for informative modules 7-8.	2
14	Principles of treatment of acute drug poisoning. Antidotes. Test control.	2
15	Finale test control.	2
Total		**30**

6. Thematic plan of independent work of students

The 5th stmester

Module 1. "Medical prescription. General pharmacology. Medicines affecting the nervous and cardiovascular system "

№	Topic	Hours	Control type
I.	Preparation for practical training - theoretical preparation and practical skills development	**30**	Current control
II.	Independent study of topics that are not included in the classroom plan:	**26**	FMC
1	Features of modern solid dosage forms.	2	-«-
2	Children's dosage forms.	2	-«-
3	Phenomena that occur with repeated and combined administration of the drug.	2	-«-
4	Chronopharmacological aspects of the action of drugs of certain groups.	2	-«-
5	Pharmacogenetics.	2	-«-
6	Drugs that affect H-cholinoreceptors. Toxicology of nicotine. Medicines to facilitate smoking cessation.	2	-«-
7	Intermediates. Pharmacology of dopamine and histaminergic drugs. Stimulants and blockers of serotonin receptors.	2	-«-
8	Astringent, coating, absorbent and irritating drugs.	2	-«-
9	Pharmacology of ethyl alcohol. Medicines for the treatment of alcoholism.	2	-«-
10	Drug addiction as a medical phenomenon.	2	-«-
11	Pharmacological neuroprotection.	2	-«-
12	Adaptogens and actoprotectors.	2	-«-
13	Medicines for the treatment of multiple sclerosis and amyotrophic lateral sclerosis.	2	-«-
III.	Preparation for the final modular control of the assimilation of module 1	**4**	FMC
	Total	**60**	

The 6th stmester

Module 2. "Medicines affecting the functions of organs, systems and metabolism. Chemotherapy drugs. Antidotes "

№	Topic	Hours	Control type
I.	Preparation for practical training - theoretical preparation and practical skills development	**30**	Current control
II.	Independent study of topics that are not included in the classroom plan:	**16**	FMC

1	Phytoniryng and modern herbal remedies for treatment of diseases of the respiratory system.	2	-«-
2	Probiotics, prebiotics and symbiotics.	2	-«-
3	Medicines affecting the metabolism of uric acid.	2	-«-
4	Preparations of macro- and microelements.	2	-«-
5	Enzyme and anti-enzymatic drugs.	2	-«-
6	Antibiotic resistance and solutions to this problem.	2	-«-
7	New groups of antibiotics.	2	-«-
8	Treatment Principles for Emergency Conditions.	2	-«-
III.	Preparation for the final modular control of the assimilation of module 2.	**4**	FMC
	Total	**50**	

7. LIST OF THEORETICAL QUESTIONS FOR PREPARING STUDENTS for the final modular control

MODULE 1: "Medical prescription. General pharmacology. Medicines affecting the nervous and cardiovascular system "

Submodule 1. Medical prescription. General pharmacology.

1. The concept of medical prescription. Determine the terms: medicinal substance, medicinal product, dosage form, medicinal product.
2. Recipe. General rules for writing prescriptions, forms of prescription forms. Rules for writing prescriptions for medicinal products containing potent, poisonous and narcotic substances.
3. Dosage forms. Types of dosage forms, peculiarities of manufacturing and prescribing in prescriptions. Requirements for dosage forms for injection.
4. Definition of pharmacology, its place among other medical and biological sciences.
5. The origin and formation of experimental pharmacology, the development of pharmacology in Ukraine and other countries.
6. Basic principles and methods of testing new medicinal substances. Preclinical and clinical studies (phases I - IV). Placebo concept. Functions of the State Pharmacological Center of the Ministry of Health of Ukraine. Law of Ukraine "On Medicines".
7. The concept of the pharmacokinetics of drugs.
8. Ways of administration and removal of medicinal products from the body, peculiarities of absorption and distribution in the body, the main types of biotransformation.
9. Concept of the main pharmacokinetic parameters (absorption rate constant, half-life, steady-state concentration, clearance).
10. Age characteristics of pharmacokinetics.
11. Definition of the concept of dose, types of doses.
12. Pharmacological medicines.
13. The concept of receptors (agonists, antagonists).
14. Types, types and methods of action of drugs.
15. Dependence of the pharmacological effect on the properties of drugs (chemical structure, physicochemical properties, their doses and frequency of use).
16. Dependence of the pharmacological effect on the age and sex of the patient. Features of the reaction of the child's body to the drug. Principles of dosage of medicines for children and the elderly.
17. The importance of climatic and anthropogenic factors for the pharmacological action of the drug.
18. The dependence of the action of drugs on the physiological characteristics of the organism and pathological conditions.
19. The concept of pharmacogenetics and chronopharmacology.

20. The action of drugs when they are repeated. The concept of material and functional cumulation, tolerance or addiction, mental and physical dependence. Concept of withdrawal and recoil syndromes.
21. The combined effect of drugs (synergism and antagonism).
22. The concept of drug safety.
23. Side effects of drugs. Types of side effects. Intolerance. Idiosyncrasy. Allergic reactions. Mutagenicity, teratogenicity, embryotoxic, fetotoxicity, carcinogenicity.

Submodule 2. Medicines affecting the peripheral nervous system.

24. Principles of classification of agents affecting the autonomic nervous system.
25. Principles of classification of drugs affecting the cholinergic nervous system. M and N cholinomimetic drugs.
26. Principles of classification of anticholinesterase drugs. Mechanism of action, pharmacological effects, indications for use, side effects.
27. Features of the action of organophosphate compounds. Acute OP poisoning and relief. Pharmacology of FOS reactivators.
28. Principles of classification and pharmacological characteristics of M-cholinomimetics. Effects on organs and systems. Indications for use.
29. Acute muscarine poisoning. Relief measures, antidote therapy.
30. Medicines affecting the H-cholinergic receptors.
31. Pharmacological effects of nicotine. Smoking as a medical and social problem. Medicines used to control tobacco smoking.
32. Principles of classification of M-anticholinergic drugs. Pharmacological characteristics of atropine sulfate. Indications for use.
33. Acute poisoning with atropine and plants containing atropine. Help measures.
34. General characteristics of H-anticholinergics. Classification of ganglion blockers. Mechanism of action. Pharmacological effects, indications for use, side effects.
35. Principles of classification of muscle relaxants. Pharmacokinetics, pharmacodynamics of tubacurarin chloride. Indications for use, side effects.
36. Principles of classification of drugs affecting adrenergic innervation.
37. Pharmacological characteristics of adrenergic agonists. Pharmacokinetics, pharmacodynamics of epinephrine hydrochloride. Indications for use.
38. Comparative characteristics of adrenomimetics. Side effect.
39. Principles of classification of antiadrenergic drugs. Features of the use of α-adrenergic blockers, mechanism of action and indications for use.
40. Pharmacological effects of β-blockers. Comparative characteristics of drugs. The concept of internal sympathomimetic activity.
41. Pharmacology of sympatholytics. Mechanism of action and indications for use, side effects.

Submodule 3. Medicines affecting the function of the central nervous system. Psychotropic medicines.

42. Principles of classification of local anesthetic drugs, mechanism of action, comparative characteristics of drugs. Indications for use, side effects.
43. Pharmacology of astringent drugs. Mechanism of action, indications for use. Pharmacological characteristics of drugs.
44. General characteristics of enveloping medicines. The mechanism of action, indications for the use of drugs.
45. Principles of classification of adsorbing agents. Mechanism of action. Indications for use. Coal preparations and synthetic sorbents.
46. Principles for the classification of irritants. Mechanism of action. Effects on skin and mucous membranes. Indications for use.
47. Principles of classification of drugs for anesthesia.
48. History of the discovery of drugs for anesthesia.
49. Types of anesthesia. anesthesia. Requirements for anesthetics. Theories of anesthesia.
50. Principles of classification of drugs for inhalation anesthesia. Comparative characteristics of drugs, side effects. The combined use of drugs for anesthesia with drugs from other pharmacological groups.
51. Principles for the classification of drugs for non-inhalation anesthesia. Comparative characteristics of drugs.
52. The concept of premedication, introductory, basic, combined anesthesia.
53. Pharmacology and toxicology of ethyl alcohol, use in clinical practice.

54. Acute and chronic alcohol poisoning, assistance measures. The principle of alcoholism treatment.
55. Opiate analgesics. Classification by chemical structure, origin and affinity for opiate receptors. mechanism of action
56. Pharmacology of morphine hydrochloride. Features of the effect of the drug on the central nervous system. Comparative characteristics of opiate analgesics. Indications for use. Side effects.
57. Acute opiate analgesic poisoning. Clinical manifestations and measures of assistance.
58. Drug dependence arising in opiate analgesics, clinical manifestations. Concept of withdrawal symptoms, treatment methods.
59. non-opiate analgesics. Classification principles, general characteristics of the group. Mechanisms of action. Pharmacological characteristics of drugs.
60. Comparative characteristics of non-opiate analgesic drugs, side effects.
61. Principles of classification of psychotropic drugs characteristics.
62. Antipsychotics. Principles of classification. The mechanism of antipsychotic action of neuroleptics.
63. Pharmacological effects of chlorpromazine.
64. Comparative characteristics of antipsychotics drugs, indications for use, side effects of antipsychotics. Combined use with drugs from other pharmacological groups.
65. The concept of neuroleptanalgesia.
66. Pharmacology of tranquilizers. Classification. Mechanism of tranquilizing action, concepts of benzodiazepine receptors.
67. Comparative characteristics of tranquilizer drugs.
68. Indications and contraindications for the use of tranquilizers, side effects. Drug addiction.
69. Combined use of tranquilizers with drugs from other pharmacological groups. The concept of ataralgesia.
70. Principles of classification of hypnotics. General characteristics of hypnotics, possible mechanisms of action.
71. Comparative characteristics of hypnotics of various groups. Indications for use, side effects.
72. Acute poisoning with barbiturates, assistance measures.
73. Principles of classification of sedatives.
74. Pharmacology of bromides. Indications for use. Side effects.
75. Bromism - Clinical Signs, Treatment, and Prevention.
76. Sedative herbal medicines.
77. Pharmacology of normotimics. Pharmacokinetics and pharmacodynamics, indications for use. Side effects. Acute poisoning with lithium preparations.
78. Antiepileptic drugs. Principles of classification, comparative characteristics, side effects of antiepileptic drugs.
79. Antiparkinsonian medicines. Classification. Basic mechanisms of action. Use in clinical practice.
80. Psychomotor stimulants. General characteristics of the group of psychostimulants.
81. Caffeine-sodium benzoate. Pharmacokinetics and pharmacodynamics, indications for use, side effects.
82. The concept of psychodysleptics and amphetamines. Formation of addiction, social significance.
83. Pharmacology of antidepressants. Classification of antidepressants by mechanism of action and chemical structure. Comparative characteristics. Side effects of antidepressants.
84. Classification of nootropic drugs. Possible mechanisms of action. Indications for use. Pharmacological characteristics of drugs.
85. Adaptogens and actoprotectors. Indications for use. Basic properties of drugs, comparative characteristics.
86. Pharmacology of analeptics. Classification, characteristics of drugs, indications for use.

Submodule 4. Medicines affecting the functions of the cardiovascular system.

87. Modern clinical classification of antihypertensive drugs.
88. Pharmacology of antihypertensive agents in the main and pre-treatment groups.
89. Principles of antihypertensive drug combination.
90. Comparative pharmacological characteristics of the above groups, the rate of development of the hypotensive effect.
91. Medicinal assistance for hypertensive crisis.
92. Lipid-lowering drugs. General pharmacological characteristics of lipid-lowering drugs, direction of action.
93. The concept of angioprotectors. Pharmacokinetics and pharmacodynamics of drugs.
94. Classification of antiarrhythmic drugs. Pharmacological characteristics. antiarrhythmic drugs.

95. Comparative characteristics, indications for the use of antiarrhythmic drugs.
96. Classification of cardiotonic drugs.
97. Pharmacokinetics and pharmacodynamics, indications and contraindications for the use of cardiac glycosides. Side effects of cardiac glycosides. Acute and chronic poisoning with cardiac glycosides, measures of assistance and prevention.
98. Pharmacological characteristics of non-glycoside cardiotonic drugs. Indications for use.
99. Classification and general pharmacological characteristics of antianginal drugs.
100. Pharmacokinetics and pharmacodynamics of nitroglycerin, side effects.
101. Mechanism of action and characteristics of calcium channel blockers (calcium antagonists). Pharmacological characteristics of drugs.
102. Features of the use in the treatment of patients with ischemic heart disease β-blockers.
103. vasodilators of myotropic action, reflex action type and energy supply means. Indications and contraindications for use, side effects.
104. Principles of complex therapy of myocardial infarction. General characteristics of pharmacological groups.
105. Hormonal preparations of the hypothalamus and pituitary gland.
106. The mechanism of action of corticotropin, indications for use, side effects. Synthetic analogs of corticotropin.
107. Pharmacological characteristics of gonadotropic hormonal drugs.
108. Pharmacological preparations of the posterior pituitary gland. Indications for use.
109. Pharmacology of thyroid hormones. Antithyroid drugs. Indications and contraindications for use, side effects.
110. Calcitonin preparations. Indications for use.
111. Hypoglycemic drugs. Classification of hypoglycemic agents.
112. Pharmacokinetics, pharmacodynamics, indications and contraindications for the use of insulin. Side effect. Features of use for hyperglycemic coma.
113. Insulin overdose, help with hypoglycemic coma.
114. Long-acting insulin preparations.
115. Synthetic antidiabetic drugs. Classification, mechanism of action, indications for use. Comparative characteristics, side effects.
116. Hormonal preparations of glucocorticoids. Pharmacological effects, indications, contraindications for use, dosage regimen. Comparative characteristics.
117. Side effects of glucocorticoids.
118. Sex hormones. Classification of sex hormones. General characteristics of female sex hormones.
119. The mechanism of action and indications for the use of estrogens, antiestrogen drugs, gestagenic drugs, antigestagenic drugs.
120. Side effects of preparations of female sex hormones and their antagonists.
121. Contraceptive (contraceptive) medicines. Classification, principles of combination, indications and contraindications for use, side effects. Comparative characteristics of contraceptive drugs.
122. Preparations of male sex hormones. Pharmacological characteristics. Indications for use, side effects.
123. Androgenic hormone antagonists.
124. Antiallergic medicines.
125. Classification and general characteristics of antiallergic drugs.
126. Medicines used for immediate hypersensitivity.
127. Pharmacology of antihistamines - H1 receptor blockers (diphenhydramine, suprastin, fencarol, diazolin, loratadin, diprazine, desloratidine).
128. Indications for the use of sodium cromolyn, ketotifen.
129. Principles of help with anaphylactic shock. Medicines used for delayed-type hypersensitivity.
130. Pharmacology of immunosuppressants (cytostatic drugs, glucocorticoids).
131. Medicines affecting immune processes.
132. Medicines affecting immunity.
133. Classification of immunity stimulants.
134. Pharmacology of thymus preparations (thymalin), leukopoiesis stimulants (sodium nucleinate, methyluracil), interferons and vaccines.
135. Immunosuppressive drugs (antimetabolites, alkylating compounds, glucocorticoids, enzyme preparations). Indications for use, side effects.

136. Pharmacotherapy with vitamin preparations and its types.
137. Classification of vitamin preparations by solubility and biological role.
138. Characteristics of water-soluble vitamin preparations. Indications for use, side effects.
139. The concept of bioflavonoids, coenzyme preparations
140. General characteristics of fat-soluble vitamin preparations. Indications and contraindications for use.
141. Side effects of fat-soluble vitamin preparations.
142. Multivitamin preparations.
143. The concept of antivitamins.
144. Pharmacological characteristics of enzymatic and ANTI-ENZYMED medicinal products. Mechanism of action and indications for the use of peptidases, proteases, nucleases, hyaluronidase preparations and enzyme inhibitors.
145. Pharmacological characteristics of preparations of macro- and microelements.
146. Sodium preparations. Pharmacological and indications for use.
147. Potassium preparations. Pharmacodynamics, indications for use.
148. Magnesium preparations. Pharmacokinetics, pharmacodynamics. The dependence of the effect on the route of administration. Indications for use.
149. Calcium preparations. Pharmacological effects, indications for use, routes of administration.

MODULE 2: "Medicines affecting the functions of executive organs and systems. Chemotherapy drugs. Antidotes ".

Submodule 5. Medicines affecting the respiratory system, gastrointestinal tract, kidney function, reproductive processes and blood.

1. Antitussive medicines. Classification, characteristics of drugs. Side effect.
2. Expectorant medicines. Classification. Pharmacokinetics and pharmacodynamics, side effects of expectorants.
3. Stimulants of surfactant synthesis. General characteristics of surfactant synthesis stimulants.
4. Classification of bronchodilator drugs. General characteristics of drugs.
5. Medicines used for pulmonary edema. Tactics of assisting with pulmonary edema, the choice of drugs.
6. Classification of drugs that affect appetite. General pharmacological characteristics of the drug.
7. Emetic medicines. Mechanism of action and application features.
8. Pharmacological characteristics of antiemetics. Indications for use, side effects.
9. Classification of medicines used for dysfunction of the stomach glands.
10. General pharmacological characteristics of drugs that stimulate the secretion of gastric glands and are used for diagnostics and replacement therapy.
11. Classification and general pharmacological characteristics of drugs that inhibit the secretion of gastric glands.
12. Pharmacological treatment of gastric ulcer, duodenal ulcer and hyperacid gastritis.
13. Pharmacological characteristics of H2-receptor blockers, Mholinoblockers and proton pump blockers.
14. General pharmacological characteristics of drugs that reduce the increased acidity of gastric juice.
15. The concept of gastroprotectors. General pharmacological characteristics of drugs.
16. Medicines, influence on the excretory function of the pancreas .. Indications for use.
17. Choleretic drugs. Classification. General characteristics. Indications for use.
18. Hepatoprotectors and cholelitholytic drugs. Indications for use.
19. Classification of laxatives. Pharmacokinetics, pharmacodynamics of drugs, indications for use.
20. General characteristics of drugs that have an anti-inflammatory effect.
21. Classification of diuretics. Pharmacokinetics and pharmacodynamics, indications for use, side effects.
22. The concept of forced diuresis.
23. Classification of anti-gout drugs. General characteristics of drugs, side effects.
24. Classification and pharmacological characteristics of drugs that affect the activity of the myometrium (uterotonics, tocolytics).
25. Pharmacological characteristics of drugs that affect reproductive processes.
26. Classification of drugs affecting hematopoiesis and hemostasis.
27. Classification of agents used for the prevention and treatment of thrombosis. General characteristics.
28. Classification of anticoagulants. Pharmacokinetics, pharmacodynamics of drugs, indications and contraindications for use. Side effect.
29. General characteristics of fibrinolytic drugs. Indications for use. Side effect.

30. Classification of coagulants. Pharmacokinetics, pharmacodynamics, indications for the use of coagulant preparations.
31. Medicines that stimulate erythropoiesis. Pharmacokinetics, pharmacodynamics, indications for use, side effects.
32. Medicines affecting leukopoiesis. The mechanism of action of stimulants of leukopoiesis. Indications for use.
33. General characteristics of drugs that inhibit leukopoiesis. Indications for use, side effects.
34. Antineoplastic (protiblastomni) drugs. Classification and general characteristics of antineoplastic agents.
35. The concept of radioisotope drugs, indications for use, side effects.

Submodule 6. Medicines affecting metabolism

36. Pharmacotherapy with vitamin preparations and its types.
37. Classification of vitamin preparations by solubility and biological role.
38. Characteristics of water-soluble vitamin preparations. Indications for use, side effects.The concept of bioflavonoids, coenzyme preparations
39. General characteristics of fat-soluble vitamin preparations. Indications and contraindications for use.
40. Side effects of fat-soluble vitamin preparations.
41. Multivitamin preparations.
42. The concept of antivitamins.
43. Classification of enzyme preparations. Mechanism of action and indications for use.
44. Combined enzyme preparations. Indications for their use.
45. Pharmacological characteristics of enzyme and antienzyme
46. Mechanism of action and indications for the use of peptidases, proteases, nucleases, hyaluronidase preparations and enzyme inhibitors.
47. General characteristics of enzyme inhibitors. Classification. Indications and contraindications for use.
48. Hormonal preparations of the hypothalamus and pituitary gland.
49. The mechanism of action of corticotropin, indications for use, side effects. Synthetic analogs of corticotropin.
50.Pharmacological characteristics of gonadotropic hormonal drugs. Pharmacodynamics of drugs in the posterior part of the hypophysis. Shown to zasosuvannya.
51. Pharmacology of thyroid hormones. Antithyroid drugs. Indications and contraindications for use, side effects.
52. Calcitonin preparations. Indications for use.
53. Hypoglycemic drugs. Classification of hypoglycemic agents.
54. Pharmacokinetics, pharmacodynamics, indications and contraindications for the use of insulin. Side effect. Features of use for hyperglycemic coma.
55. Insulin overdose, help with hypoglycemic coma.
56. Long-acting insulin preparations.
57. Synthetic antidiabetic drugs. Classification, mechanism of action, indications for use. Comparative characteristics, side effects.
58. Hormonal preparations of glucocorticoids. Pharmacological effects, indications, contraindications for use, dosage regimen. Comparative characteristics.
59. Side effects of glucocorticoids.
60. Sex hormones. Classification of sex hormones. General characteristics of female sex hormones.
61. Mechanism of action and indications for the use of estrogens, antiestrogenic drugs, gestagenic drugs, antigestagenic drugs.
62. Side effects of preparations of female sex hormones and their antagonists.
63. Contraceptive (contraceptive) medicines. Classification, principles of combination, indications and contraindications for use, side effects. Comparative characteristics of contraceptive drugs.
64. Preparations of male sex hormones. Pharmacological characteristics. Indications for use, side effects.
65. Antagonists of androgenic hormones.
66. Antiallergic medicines.
67. Classification and general characteristics of anti-allergic drugs.
68. Medicines used for immediate hypersensitivity.
69. Pharmacology of antihistamines - H1-receptor blockers (diphenhydramine, suprastin, fencarol, diazolin, loratadine, diprazine, desloratidine).
70. Indications for the use of sodium cromolyn, ketotifen.

71. Principles of help with anaphylactic shock. Medicines used for delayed-type hypersensitivity.
72. Pharmacology of immunosuppressants (cytostatic drugs, glucocorticoids).
73. Medicines affecting immune processes.
74. Medicines affecting immunity.
75. Classification of immunity stimulants.
76. Pharmacology of thymus preparations (thymalin), leukopoiesis stimulants (sodium nucleinate, methyluracil), interferons and vaccines.
77. Immunosuppressive drugs (antimetabolites, alkylating compounds, glucocorticoids, enzyme preparations). Indications for use, side effects.

Submodule 7. Chemotherapy drugs.

78. Requirements for modern antiseptic agents.
79. Classification and pharmacological characteristics of antiseptic drugs.
80. Mechanism of action of halogens and halogenated compounds. Indications for use, side effects. Acute poisoning and relief measures.
81. Mechanism of action, indications for the use of oxidants. Comparative characteristics of drugs.
82. Preparations of acids, alkalis. Local and resorptive action of acids and alkalis. Antiseptic action of preparations of acids and alkalis. Indications for use. Acute poisoning with acids and alkalis. Help measures.
83. Pharmacology of preparations of heavy metal salts. Mechanism of action. Side effects of heavy metal salt preparations. Acute poisoning. Help in acute poisoning with salts of heavy metals, principles of antidote therapy.
84. Pharmacology of aromatic antiseptics. The mechanism of action of drugs of the phenol group. Side effects. Acute phenol poisoning, help.
85. The mechanism of action of nitrofuran derivatives, indications and contraindications for use. Comparative characteristics of drugs.
86. The mechanism of the antimicrobial action of dye preparations. Pharmacological characteristics of drugs. Indications for use.
87. Antiseptic - derivatives of the aliphatic series. Pharmacokinetics, pharmacodynamics of formaldehyde. Side effect.
88. The mechanism of antimicrobial action of ethyl alcohol.
89. Pharmacology of surface substances. Mechanism of action, indications for the use of detergents.
90. sulfa drugs. Classification. Pharmacokinetics and pharmacodynamics of sulfonamides. Indications for use. Side effects and ways to prevent it. Comparative characteristics of drugs. Combined preparations of sulfonamides.
91. Synthetic antimicrobial medicines. Quinoline derivatives. Classification, mechanism of action, indications for use, side effects. Characteristics of drugs.
92. The peculiarity of the use of fluoroquinolone derivatives in medical practice.
93. Antifungal (antimycotic) drugs. Classification.
94. Pharmacological characteristics of antibiotics of polyene structure and antifungal drugs of other groups. Indications for use, side effects.
95. The concept of antibiosis, antibiotics, antibiotic spectrum of action. Principles of antibiotic therapy.
96. Classification of antibiotics by chemical structure, spectrum and mechanism of action.
97. Classification and pharmacological characteristics of antibiotics of the penicillin group. Mechanism spectrum and duration of action.
98. Classification and pharmacological characteristics of antibiotics of the cephalosporin group. The mechanism and spectrum of action of drugs. Indications for use. Side effect.
99. Antibiotics of the macrolide and azalide group. General characteristics, mechanism and spectrum of action, indications for use, side effects.
100. Antibiotics of the tetracyclines group. Pharmacokinetics, mechanism and spectrum of action, indications and contraindications for use, side effects and their prevention.
101. Antibiotics of the chloramphenicol group. Mechanism of action and spectrum of action, indications for use, side effects.
102. Pharmacology of aminoglycoside preparations, classification. Comparative characteristics, mechanism of action, indications and contraindications for use, side effects.
103. Antibiotics of the group of cyclic polypeptides (polymyxins). Mechanism and spectrum of action, indications for use, routes of administration, side effects.
104. Classification of drugs used to treat tuberculosis.

Pharmacokinetics, pharmacodynamics of isonicotinic acid hydrazide derivatives.
105. Side effects arising from prolonged use and ways to prevent them.
106. Pharmacological characteristics of rifampicin. Features of long-term use.
107. Pharmacological characteristics of anti-tuberculosis drugs of various chemical groups. Side effects.
108. Antiviral medicines. Classification.
Pharmacological characteristics of drugs, prescribed to patients with influenza. Features of the application.
109. Medicines used for herpes infection.
Possibilities of using antiviral agents in the complex treatment of AIDS patients.
110. Classification of anti-syphilitic drugs. General characteristics of anti-syphilitic agents.
111. Features of the use of antibiotics, bismuth preparations in the treatment of syphilis.
112. Classification of antiprotozoal drugs.
113. Antimalarial medicines. Basic principles of prevention and treatment of malaria. Classification of antimalarial drugs. Mechanism of action.
114. Drug therapy for malarial coma.
115. Medicines used for the treatment of trichomoniasis. Pharmacokinetics, pharmacodynamics of metronidazole. Indications for use and side effects.
116. Medicines for the treatment of patients with chlamydia.
117. Classification of anti-amebic drugs. Pharmacological characteristics of drugs.
118. Medicines for the treatment of patients with giardiasis.
119. Medicines used to treat patients with toxoplasmosis.
120. Anthelmintic (anthelminthic) drugs. Classification of anthelmintic drugs.
Application features for various types of helminthiasis.
121. Pharmacology of agents used to treat intestinal helminthiasis.
122. Medicines used for extraintestinal helminthiasis.
Submodule 8. Antidotes. Plasma substitutes and preparations for parenteral nutrition.
123. Pharmacological characteristics of preparations of macro- and microelements.
124. Sodium preparations. Pharmacological and indications for use.
125. Potassium preparations. Pharmacodynamics, indications for use.
126. Preparations of magnesium. Pharmacokinetics, pharmacodynamics. The dependence of the effect on the route of administration. Indications for use.
127. Calcium preparations. Pharmacological effects, indications for use, routes of administration.
128. Plasma-substituting liquids. General characteristics of plasma substitutes. Pharmacological and indications for use.
129. Preparations for parenteral nutrition.
130. Causes and symptoms of acute drug poisoning of various pharmaceutical groups.
131. Methods of active detoxification.
132. The concept of antidotes. Types of antidote therapy. Pharmacological characteristics of the main antidotes.
133. Principles of symptomatic therapy of acute poisoning.
134. Basic principles of pharmacotherapy of acute emergency conditions.
135. Preparations for the treatment of emergency conditions, principles of their appointment and routes of administration.

8. TRAINING METHODS

1. Verbal (lecture, explanation, story, conversation, instruction)
2. Visual (observation, illustration, demonstration)
3. Practical (various types of exercises, performing graphic works, conducting an experiment, practice).

During the educational process, the following teaching methods are also used:

□ explanatory-illustrative or information-receptive, which provides for the presentation of ready-made information by the teacher and its assimilation by students;

□ reproductive, which is based on the execution of various kinds of tasks according to the model;

□ the method of problem presentation, which consists in the fact that the teacher poses a problem and solves it himself, demonstrating the contradictions that characterize the process of cognition, while the task of students is to control the sequence of presentation of the material, the materiality of evidence, and predict the next steps of the teacher; this MN is realized by teaching students on problem situations with the aim of successful preliminary preparation for future work in real conditions of practical medical institutions;

□ partial search or heuristic, aimed at mastering individual elements of search activity, for example: the teacher formulates a problem, students - a hypothesis;
□ research, the essence of which is the teacher organizing the creative search activity of students by posing new problems and problematic tasks.
□ methods that ensure the perception and assimilation of knowledge by students (lectures, independent work, instruction, consultation)
□ methods of applying knowledge and acquiring and consolidating skills and abilities (practical exercises, control tasks)
□ methods of testing and assessing knowledge, skills and abilities.

9. Control methods

9.1. Current control is carried out on the basis of control of theoretical knowledge, skills and abilities in practical classes. The student's independent work is assessed in practical classes and is a component of the student's final grade. Current control is carried out during training sessions and is aimed at checking the assimilation of educational material by students. The forms of current control are:
a) test tasks with the choice of one correct answer, with the determination of the correct sequence of actions, with the determination of compliance, with the determination of a certain area in the photograph or diagram ("recognition");
b) individual oral questioning, interview;
c) solving typical situational tasks;
d) control of practical skills;
e) solving typical problems in pharmacology;
f) writing prescriptions.
9.2. The form of the final control of progress is carried out in the form of an exam (in writing, orally) (IV semester).
The semester exam is a form of final control of the student's assimilation of theoretical and practical material in the discipline. Final control (exam) is carried out at the last control lesson.

Students who have attended all the classroom training sessions provided for by the curriculum for the discipline and, while studying the module, scored at least the minimum number of points (72 points) are allowed to the PC. A student who, for good or without good reason, had missed classes, is allowed to work out academic debt until a certain certain period.

The forms of the final control should be standardized and include control of theoretical and practical training.

10. SCHEME OF ACCRUAL AND DISTRIBUTION OF POINTS, WHICH ARE RECEIVING APPLICANTS OF HIGHER EDUCATION.

Assessment of current learning activities. When assessing the assimilation of each topic for the current educational activity, the student is given grades on a 4-point (national) assessment scale. This takes into account all types of work provided by the discipline program. The student must receive a grade for each topic. The marks given according to the traditional scale are converted into points. The final grade for the current educational activity is recognized as the arithmetic mean (the sum of grades for each lesson is divided by the number of lessons in the semester) and is converted into points according to Table 1.
The maximum number of points that a student can score for the current educational activity for admission to the exam is 120 points.
The minimum number of points that a student must score for current educational activities to be admitted to the exam is 72 points. The calculation of the number of points is based on the student's grades on a 4-point (national) scale in the study of the discipline, by calculating the arithmetic mean (CA), rounded to two decimal places.

Table 1. Recalculation of the average assessment of the current activity into a multi-point scale (for disciplines ending with a credit)

4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale
5	200	4,47	179	3,94	158	3,42	137
4,97	199	4,45	178	3,92	157	3,4	136
4,95	198	4,42	177	3,89	156	3,37	135

4,92	197	4,4	176	3,87	155	3,35	134
4,9	196	4,37	175	3,84	154	3,32	133
4,87	195	4,35	174	3,82	153	3,3	132
4,85	194	4,32	173	3,79	152	3,27	131
4,82	193	4,3	172	3,77	151	3,25	130
4,8	192	4,27	171	3,74	150	3,22	129
4,77	191	4,24	170	3,72	149	3,2	128
4,75	190	4,22	169	3,7	148	3,17	127
4,72	189	4,19	168	3,67	147	3,15	126
4,7	188	4,17	167	3,65	146	3,12	125
4,67	187	4,14	166	3,62	145	3,1	124
4,65	186	4,12	165	3,6	144	3,07	123
4,62	185	4,09	164	3,57	143	3,05	122
4,6	184	4,07	163	3,55	142	3,02	121
4,57	183	4,04	162	3,52	141	3	120
4,55	182	4,02	161	3,5	140	Less than 3	Not enough
4,52	181	3,99	160	3,47	139		
4,5	180	3,97	159	3,45	138		

Assessment of individual student assignments. Points for individual tasks are awarded only if they are successfully completed and protected. The number of points that are awarded for various types of individual assignments depends on their volume and weight, but no more than 10-12 points. They are added to the total of the points the student earned in the classroom during the current academic activity. In any case, the total amount of current activities cannot exceed 120 points.

Assessment of students' independent work. Independent work of students, which is provided for by the topic of the lesson along with classroom work, is assessed during the current control of the topic in the corresponding lesson. The assimilation of topics that are taken out only for independent work is checked during the final modular control.

Assessment of the final control. The maximum number of points that a student can score during the exam is 80 points.

The final control is considered enrolled if the student scored at least 60% of the maximum score (for a 200-point scale - at least 50 points).

Determination of the number of points that a student scored in a discipline: the number of points that a student scored in a discipline is determined as the sum of points for the current educational activity and for the final control (exam).

Converting the number of points in the discipline into grades on the EKTC scale and on a four-point (traditional) scale:

Scores for disciplines are independently converted to both the EKTC scale and the national grading scale, but not vice versa. Table 2.

Table 2. Recalculation of the average assessment of current activities into a multi-point scale (for disciplines, completed with an exam)

4-point scale	120-point scale	**4-point scale**	120-point scale	**4-point scale**	120-point scale	**4-point scale**	120-point scale
5	120	4,45	107	3,91	94	3,37	81
4,95	119	4,41	106	3,87	93	3,33	80
4,91	118	4,37	105	3,83	92	3,29	79
4,87	117	4,33	104	3,79	91	3,25	78
4,83	116	4,29	103	3,74	90	3,2	77
4,79	115	4,25	102	3,7	89	3,16	76
4,75	114	4,2	101	3,66	88	3,12	75
4,7	113	4,16	100	3,62	87	3,08	74
4,66	112	4,12	99	3,58	86	3,04	73
4,62	111	4,08	98	3,54	85	3	72
4,58	110	4,04	97	3,49	84	Less than 3	Not enough
4,54	109	3,99	96	3,45	83		

4,5	108	3,95	95	3,41	82		

Criteria for establishing the assessment of the traditional 4-point and ECTS scale for passing the exam:

Score in points	Assessment	Assessment on the ECTS scale
180-200	on the national scale	A
160-179	Excellent	B
150-159		C
130-149	Okay	D
120-129		E
50-119	Satisfactorily	FX
0-49		F

Criteria for evaluation.

When assessing the assimilation of each topic for the current educational activity, the applicant for higher education is given marks according to the national (traditional) scale, taking into account the approved assessment criteria:

- mark "excellent" (5) - the student has impeccably mastered the theoretical material of the topic of the lesson, demonstrates deep and comprehensive knowledge of the relevant topic, the main provisions of scientific primary sources and recommended literature, thinks logically and builds an answer, freely uses the acquired theoretical knowledge in the analysis of practical material, expresses his attitude to certain problems, demonstrates a high level of mastering practical skills;
- assessment "good" (4) - the student has mastered the theoretical material of the lesson well, has the main aspects from primary sources and recommended literature, expounds it reasonably, owns the skills, expresses his views on certain problems, but certain inaccuracies and errors in logic are allowed presentation of theoretical content or when performing practical skills;
- assessment "satisfactory" (3) - the student has basically mastered the theoretical knowledge of the academic topic, is guided by primary sources and recommended literature, but answers unconvincingly, confuses concepts, additional questions cause the student to be uncertain or lack of stable knowledge; answering questions of a practical nature, discovers inaccuracies in knowledge, does not know how to evaluate facts and phenomena, associate them with future activities, makes mistakes when performing practical skills;
- assessment "unsatisfactory" (2) - the student has not mastered the educational material of the topic, does not know scientific facts, definitions, almost does not orientate himself in primary sources and recommended literature, there is no scientific thinking, practical skills are not formed.

The marks given according to the traditional scale are converted into points. The minimum number of points that a student must score for current academic activity per semester to be admitted to the exam is 120 points.

11. METHODOLOGICAL SUPPORT

1. Working curriculum for the discipline.
2. Calendar-thematic plans of lectures and practical lessons.
3. Samples of test items for classes.
4. Test assignments for the exam.

12. RECOMMENDED LITERATURE

Basic literature:

1. Chekman I.S., Gorchacova N.O., Panasenko N.I., Bech P.O. Pharmacology. Vinnytsya: Nova knyha Publishers, 2006. 384p.
2. Firdaus M. Review of Pharmacology, 7th edition. Karachi: Riaz Medical Publishers, 2007. 190 p.
3. Ganziy T.V. Study Guide to Basic Pharmacology. Kharkiv: Fakt, 2005. 264 p.
4. Katzung B.G. Basic and Clinical Pharmacology, 9th edition. New-York: Lange, 2004. 1202 p.

5. Laurence D.R., Bennet P.N., Brown M.G. Clinical Pharmacology, 8th edition. London: ChurchillLivingstone Elsevier, 1998. 710 p.

Additional literature:

1. Lippincott's Illustrated Reviews: Pharmacology, 4th Edition / Ed.: R.Finkel, M.A. Clark, L.X. Cubeddu. –Lippincott Wlliams Wilkins, 2008. – 560 p.
2. Lullman H, Albrcht Z., Klaus M, Detlef B. Color Atlas of Pharmacology. Stuttgart – New-York: Thieme, 2000. 386 p. 7. Rang H.P., Dale M.M., Ritter J.M., Moore P.K. Rang's and Dale's Pharmacology, 6th edition. London: Churchill-Livingstone Elsevier, 2007. 830 p.
8. Stefanov O., Kucher V. Pharmacology with general prescription: text-book for English-speaking students, 2nd edition. K., 2007. 318 p.
9. Stringer J.L. Basic Concepts in Pharmacology. A students survival guide, 2nd edition. McGrow-Hill International Edition, 2001. 286 p.

Approved:

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