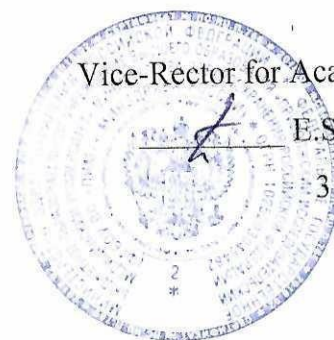


Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation



APPROVED

Vice-Rector for Academic Affairs

E.S. Bogomolova

31 August 2021

WORKING PROGRAM

Name of the academic discipline: **PHARMACOLOGY**

Specialty: **31.05.01 GENERAL MEDICINE**

Qualification: **GENERAL PRACTITIONER**

Department: **GENERAL AND CLINICAL PHARMACOLOGY**

Mode of study: **FULL-TIME**

Labor intensity of the academic discipline: **252 academic hours**

Nizhny Novgorod
2021


The work program was developed in accordance with the Federal State Educational Standard HE - specialty in the specialty 31.05.01 General medicine, approved by Order No. 988 of the Ministry of Education and Science of the Russian Federation dated August 12, 2020 (registered with the Ministry of Justice of the Russian Federation on 26.08.2020 No. 59493).

Developers of the working program:

Lovtsova L. V., Doctor of Medical Sciences, academic title-Associate Professor, Head of the Department of General and Clinical Pharmacology.

Sorokina Yu. A., Candidate of Biological Sciences, academic title-Associate Professor, Associate Professor of the Department of General and Clinical Pharmacology.

The program was reviewed and approved at the meeting of the Department (Minutes No. 7 of 09.06.2021)


Head of the Department of General and Clinical Pharmacology,
 Doctor of Medical Sciences, Associate Professor _____  L. V. Lovtsova
 09.06.2021 (signature)

REVIEWERS:

1. Professor of the Department of Pharmacology and Clinical Pharmacology with a course in Pharmaceutical Technology of the Medical Institute of the Ogarev National Research Mordovian State University of the Ministry of Science and Higher Education of the Russian Federation, Doctor of Medical Sciences, Professor A.V. Siprov.

2. Professor of the Department of Medical Physics and Informatics of the Federal State Budgetary Educational Institution of Higher Education "PIMU" of the Ministry of Health of the Russian Federation, Chairman of the cyclic Methodological Commission for Natural Science Disciplines, Doctor of Biological Sciences, Associate Professor S. L. Malinovskaya.

AGREED

Deputy Head of EMA ph.d. of biology _____  Lovtsova L.V.
 (signature)

09.06.2021

1. The purpose and objectives of mastering the academic discipline pharmacology
(hereinafter – the discipline):

1.1. The purpose of mastering the discipline: (*participation in forming the relevant competencies*).

1.2. Tasks of the discipline:

1. to form students' understanding of the role and place of pharmacology among the fundamental and medical sciences, the directions of development of the discipline and its achievements;
2. to acquaint students with the history of the development of pharmacology, the activities of the most prominent persons of medicine and pharmacy, the contribution of domestic and foreign scientists to the development of world medical science;
3. to acquaint students with the main stages of the formation of pharmacology as a medical and biological discipline, the main stages of development, fundamental approaches to the creation of medicines;
4. to teach students to analyze the effect of drugs on the totality of their pharmacological effects, mechanisms and localization of action, pharmacokinetic parameters;
5. to form students' ability to evaluate the possibilities of choosing and using medicines based on ideas about their properties for the purposes of effective and safe prevention, pharmacotherapy and diagnosis of diseases of individual systems of the human body;
6. to teach students to recognize possible side effects and toxicological manifestations when using medications and to implement the treatment;
7. to teach students the principles of prescribing and composing prescriptions, the ability to prescribe medicines in various dosage forms, as well as in certain pathological conditions, based on the characteristics of pharmacodynamics and pharmacokinetics of drugs;
8. to teach students the organization of work with medications, basic skills of prescription document management, rules for storing medicines from the list of potent and poisonous, as well as lists of narcotic drugs and psychotropic substances;
9. to form students' skills necessary for solving individual research and scientific tasks in the field of pharmacology, taking into account ethical, deontological aspects, the basic requirements of information security;
10. to form students' skills of a healthy lifestyle, work organization, safety regulations and control over compliance with environmental safety.

1.3. Requirements to the deliverables of mastering the discipline

As a result of completing the discipline, the student should

- **Know:** general laws of pharmacokinetics and pharmacodynamics of medicinal products;
- belonging of drugs to certain pharmacological groups, classification, pharmacodynamics and pharmacokinetics of drugs, indications for use, side effects, contraindications to use;
- procedure for prescribing medicinal products and issuing prescription forms for medicinal products.
- **Be able to:** identify drug groups for the treatment of a particular disease.
- analyze the effect of drugs on the totality of their pharmacological properties and the possibility of using drugs for therapeutic treatment of the adult population;
- predict and evaluate adverse drug reactions.
- write prescriptions for drugs.

Possess:

- skills of prescribing drugs in the treatment of various diseases and pathological processes in the adult population.

2. Position of the academic discipline in the structure of the General Educational Program of Higher Education (GEP HE) of the organization.

2.1. The discipline pharmacology refers to the core part (or *the part formed by the participants of educational relations*) of Block 1 (B1. B. 20) of GEP HE (Academic discipline index).

The discipline is taught in 5 and 6 semester/3 year of study.

2.2. The following knowledge, skills and abilities formed by previous academic disciplines are required for mastering the discipline:

- *Latin language*
- *Chemistry*
- *Biology*
- *Anatomy*
- *Biochemistry*
- *Normal physiology*
- *Microbiology, Virology*
- *Immunology*
- *Pathophysiology, clinical pathophysiology*

2.3. Mastering the discipline is required for forming the following knowledge, skills and abilities for subsequent academic disciplines:

- *Clinical Pharmacology*
- *Faculty therapy, occupational diseases*
- *Psychiatry, medical psychology*
- *Hospital therapy, endocrinology*
- *Infectious diseases*
- *Outpatient therapy*
- *Surgical disciplines.*

3. Deliverables of mastering the academic discipline and metrics of competence acquisition

Mastering the discipline aims at acquiring the following universal (UC) or/and general professional (GPC) or/and professional (PC) competencies

#	Code of competence	Content of the competence (or part of it)	Code and name of the indicator of achievement of competence	As a result of studying the discipline students must::		
				To know	to be Able	to possess
1.	UC-1	Able to carry out a critical analysis of problem situations on the basis of a systematic approach to develop a strategy of action	IUC 1.2. Knows how to acquire new knowledge on the basis of analysis, synthesis, etc.; to collect data on complex scientific issues related to the professional field; to search for information and solutions on the basis of action, experimentation and experience IUC 1.3 Has practical experience in the study of problems of professional activities with the use of analysis, synthesis and other methods of intellectual activity; developing action strategies for solving professional problems	<ul style="list-style-type: none"> • General laws of the pharmacokinetics and pharmacodynamics of drugs (PK AND PD); • PK AND PD belonging to certain pharmacological group, pharmacodynamics and pharmacokinetics of drugs, indications, side effects, contraindications 	<ul style="list-style-type: none"> • to define groups of drugs for the treatment of a certain disease; • to analyze the effect of drugs on the totality of their pharmacological properties and the ability to use drugs for therapeutic treatment of the adult population; • to predict and evaluate adverse drug reaction 	<ul style="list-style-type: none"> • skills prescription of a drug for the treatment of various diseases and pathological processes in the adult population
2.	GPC-7	Able to prescribe treatment and monitor its effectiveness and safety	IGPC 7.1. Knows methods of medical treatment, groups of drugs used for medical care in the treatment of most common diseases and their mechanism of action, medical indications and	<ul style="list-style-type: none"> • General principles of pharmacokinetics and pharmacodynamics of drugs (PK AND PD); • PK AND PD belonging to certain pharmacological group, pharmacodynamics and pharmacokinetics of 	<ul style="list-style-type: none"> • to define groups of drugs for the treatment of a certain disease; • to analyze the effect of drugs on the totality of their pharmacological properties and the ability to use drugs for 	<ul style="list-style-type: none"> • skills prescription of a drug for the treatment of various diseases and pathological processes in the adult population

			<p>contraindications to the appointment; compatibility, possible complications, side effects, adverse reactions, including serious and unexpected; features provide medical care in case of emergency forms</p>	<p>drugs, indications, side effects, contraindications; • order prescription of a drug and registration of prescription forms on RS</p>	<p>therapeutic treatment of the adult population; • to predict and evaluate adverse drug reactions; • the use of prescription drugs</p>	
3.	PC-4	<p><u>Able to apply drugs and medical devices in the provision of medical assistance in emergency and emergency forms</u></p>	<p>IPC 4.1. Knows: modern methods of use of medicines for diseases and conditions in accordance with the applicable procedures of medical care, clinical recommendations (treatment protocols) on the provision of medical care to meet the standards of medical care in the provision of medical assistance in emergency and emergency forms; the mechanism of action of drugs, medical indications and contraindications for their use; complications caused by their use of PCI 4.2. Able to prescribe drugs with consideration of diagnosis, age and clinical picture of the</p>	<p>• General principles of pharmacokinetics and pharmacodynamics of drugs (PK AND PD); • PK AND PD belonging to certain pharmacological group, pharmacodynamics and pharmacokinetics of drugs, indications, side effects, contraindications; • the order of appointment of drugs and registration of prescription forms</p>	<p>• to define groups of drugs for the treatment of certain diseases; • to analyze the effect of drugs on the totality of their pharmacological properties and the ability to use drugs for therapeutic treatment of the adult population; • to predict and evaluate adverse drug reactions; • the use of prescription drugs</p>	<p>• skills prescription of a drug for the treatment of various diseases and pathological processes in the adult population</p>

			disease in accordance with the applicable procedures of medical care, clinical recommendations (treatment protocols) on the provision of medical assistance in emergency and emergency forms			
4.	PC-8	<u>Able to develop a plan of treatment for the disease or condition and to prescribe medications, medical products, health food and non-pharmacological treatment according to diagnosis, age and clinical presentation in accordance with the applicable procedures of medical care, clinical recommendations (treatment protocols) on the provision of medical assistance, taking into account standards to assess the effectiveness and safety of the use of medicines, medical devices, therapeutic</u>	IPC-8.1. Knows: modern methods of using medicines for diseases and conditions in the patient in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards medical care; mechanism of action of medicinal products, medical indications and contraindications to their use; complications caused by their use	<ul style="list-style-type: none"> • general laws of pharmacokinetics and pharmacodynamics of medicinal products(drugs); • belonging of drugs to certain pharmacological groups, pharmacodynamics and pharmacokinetics of drugs, indications for use, side effects, contraindications to use; • procedure for prescribing drugs and registration 	<ul style="list-style-type: none"> • of medical devices determine groups of drugs for the treatment of a particular disease; • analyze the effect of drugs on the totality of their pharmacological properties and the possibility of using drugs for therapeutic treatment of the adult population; • predict and evaluate undesirable drug reactions; • write prescriptions for drugs 	<ul style="list-style-type: none"> • and prescribe drugs in the treatment of various diseases and pathological processes in the adult population

		nutrition and other methods of treatment				
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4. Sections of the academic discipline and competencies that are formed when mastering them

№ n /	Competence code	Section name of the discipline	The content of the section in teaching units
1.	UC-1 (IUC-1.2, IUC-1.3), GPC-7 (IGPC-7.1), PC-4 (IPC-4.1, IPC-4.2), PC-8 (IPC-8.1)	General recipe	<p>1. Introduction. Basic concepts (medicinal substance, medicinal product), dosage form, medicinal product). Types of medicinal raw materials. State Pharmacopoeia. Nomenclature of medicinal products. Recipe. Rules for prescribing and dispensing medicines.</p> <p>2. Rules for prescribing dosage forms Solid dosage forms. Powders, tablets, and dragees. Definition, types, and rules of discharge. Liquid dosage forms. Solutions for external use. Solutions for internal use. Dosage forms for injection. Definition, types, and rules of discharge. Dosage forms made from vegetable raw materials. Definition, types, and rules of discharge. Soft dosage forms. Ointments, pastes, and suppositories. Definition, types, and rules of discharge. Other dosage forms (aerosols). Write-out rules.</p>
2.	UC-1 (IUC-1.2, IUC-1.3), GPC-7 (IGPC-7.1), PC-4 (IPC-4.1, IPC-4.2), PC-8 (PCI-8.1)	General Pharmacology	<p>1. Definition of pharmacology, content, tasks, position among other medical disciplines. The main stages of pharmacology development.</p> <p>2. Pharmacokinetics. Definition. Ways of drug administration. Absorption, distribution, deposition, and conversion of drugs in the body. Ways of drug elimination from the body.</p> <p>3. Pharmacodynamics. Definition. Mechanism and localization of action. The main biological substrates that drugs interact with. The concept of specific receptors, agonists and antagonists. Types and nature of drug action. Factors affecting the pharmacokinetics and pharmacodynamics of drugs.</p> <p>4. Main and side effects of drugs. Undesirable drug reactions.</p> <p>5. Dependence of the pharmacotherapeutic effect on the properties of drugs and the conditions of their use. Chemical structure, physico-chemical and physical properties of medicinal products. Dependence of the effect on the dose (concentration). Types of doses. Repeated use of drugs (accumulation, addiction, drug dependence). Medical and social aspects of the fight against drug addiction. Interaction of the personal account. Synergism, antagonism, synergio-antagonism. Definition, types.</p> <p>6. The significance of individual characteristics of the body and its condition for the manifestation of the drug effect (age, gender, genetic factors, the state of the body, the value of daily rhythms).</p> <p>7. Fundamentals of modeling pharmacological processes. Application of information technologies and methods of modeling pharmacological processes in the field of research and development of new medicines.</p> <p>8. General principles of treatment of acute drug poisoning. The concept of detoxification of the body. Principles of detoxification and basic methods of detoxification of the body. Symptomatic treatment of acute poisoning. Prevention of</p>

3.	<p>UC-1 (IUC-1.2, IUC-1.3), GPC-7 (IGPC-7.1), PC-4 (IPC-4.1, IPC-4.2), PC-8 (IPC-8.1)</p>	<p>Drugs regulating the functions of the peripheral nervous system</p>	<p>acute poisoning.</p> <p>1. Medications that reduce the sensitivity of the afferent nerve endings or prevent their excitation: <u>Anesthetic agents (local anesthetics)</u>. Classification. Mechanism of action. Indications for use. Side effects. <u>Astringents</u>. Organic and inorganic binders. Mechanism of action. Indications for use. <u>Enveloping agents</u>. Mechanism of action. Indications for use. <u>Adsorbent agents</u>. Mechanism of action. Indications for use.</p> <p>1. Medications that stimulate the endings of afferent nerves <u>Irritating agents</u>. Pharmacological effects. Indications for use.</p> <p>3. Drugs affecting efferent innervation: 3.1. Agents affecting cholinergic synapses: Pharmacological regulation of the main stages of cholinergic transmission of nerve impulses. Classification of agents affecting cholinergic synapses. <u>Drugs that stimulate M - and N-holinoreceptors (M - and N-holinomimetics)</u>. The mediator and its derivatives. <u>Drugs that block M - and N-holinoreceptors (M -, N-holinoblockers) ("Antiparkinsonian drugs")</u>. <u>Anticholinesterase agents</u>. Drugs of reversible and irreversible action. Pharmacological effects. Indications for use. Measures to help with poisoning with anticholinesterase agents (FOS). Cholinesterase reactivators. <u>Drugs that affect muscarinic-sensitive cholinergic receptors</u>. <u>Drugs that stimulate M-holinoreceptors (M-holinomimetics, or muscarinomimetics)</u>. Pharmacological effects. Indications for use. Measures to help with poisoning with M-cholinomimetics. <u>Agents that block M-holinoreceptors (M-holinoblockers, or atropine-like agents)</u>. Effect of atropine on the eye, cardiovascular system, smooth muscle tone, and glandular secretion. Features of action on the central nervous system. Atropine poisoning, relief measures. Atropine-like medicinal products. Indications for use. <u>Drugs that affect nicotine-sensitive cholinergic receptors</u>. <u>Drugs that stimulate nicotine-sensitive cholinergic receptors (N-cholinomimetics)</u>. Pharmacodynamics and pharmacokinetics of nicotine. Acute and chronic nicotine poisoning. N-cholinomimetic drugs. <u>Drugs that block nicotine-sensitive cholinergic receptors and / or related ion channels. Agents that block the transmission of arousal in the autonomic ganglia (g a n g l i o b l o k a t o r s)</u> Classification. Mechanism of action. Pharmacological effects. Indications for use. Side effects. <u>Drugs that block neuromuscular transmission (for example, drugs that block neuromuscular transmission, or peripheral muscle relaxants)</u>. Classification. Mechanism of action. Indications for use. Side effects. Contraindications to use. Antagonists of antidepolarizing muscle relaxants.</p> <p>3.2. Agents affecting adrenergic synapses: Ways of pharmacological action on adrenergic transmission of nerve impulses. Classification of adrenergic agents. 3.2.1. Drugs that stimulate adrenoreceptors (adrenomimetics): <u>Drugs that stimulate alpha-and beta-adrenergic receptors (alpha -, beta-adrenomimetics)</u>. Pharmacological effects of epinephrine (effects on the cardiovascular system, smooth muscles, metabolism, etc.). Side effects. Features of the action of norepinephrine, indications for use. <u>Drugs that stimulate mainly alpha-adrenergic receptors (alpha-adrenomimetics)</u>. Pharmacological effects, indications for use.</p>
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			<p><u>Drugs that stimulate mainly beta-adrenergic receptors (beta-adrenomimetics)</u>. Pharmacological effects. Indications for use. Side effects.</p> <p><u>3.2.2. Agents that block adrenoceptors (adrenoblockers):</u></p> <p><u>Drugs that block alpha-adrenergic receptors (alpha-blockers)</u>. Pharmacological effects. Indications for use. Side effects.</p> <p><u>Drugs that block beta-adrenergic receptors (beta-blockers)</u>. Pharmacological effects. Indications for use. Side effects. Contraindications to use.</p> <p><u>Drugs that block alpha-and beta-adrenergic receptors (alpha -, beta-blockers)</u>. Pharmacological effects, indications for use, side effects.</p> <p><u>3.2.3. Means of presynaptic action:</u></p> <p><u>Sympathomimetics (indirect adrenomimetics)</u>. Mechanism of action. Pharmacological effects.</p> <p><u>Sympatholytics (drugs that inhibit the transmission of arousal from the endings of adrenergic fibers)</u>. Mechanism of action. Pharmacological effects.</p>
4.	<p>UC-1 (IUC-1.2, IUC-1.3),</p> <p>GPC-7 (IGPC-7.1),</p> <p>PC-4 (IPC-4.1, IPC-4.2),</p> <p>PC-8 (IPC-8.1)</p>	<p>Drugs regulating the functions of the central nervous system</p>	<p>1. Means for anesthesia (general anesthetics). Classification. The concept of the breadth of narcotic action. <u>Means for inhalation anesthesia. Means for non-inhalation anesthesia</u>. Pharmacological characteristics.</p> <p>2. Ethyl alcohol. Pharmacokinetics. Resorptive effect of ethyl alcohol. Local action of ethyl alcohol. Application in medical practice. Acute and chronic ethyl alcohol poisoning, relief measures.</p> <p>3. Sleeping pills. Classification. <u>Benzodiazepine receptor agonists</u>. The mechanism of hypnotic action. Pharmacological effects. Side effects. <u>Melatonin receptor agonists</u>. Features of action and application. <u>Sleeping pills with a narcotic type of action</u>. Pharmacological characteristics of barbiturates. Side effect of sleeping pills. Development of drug addiction. Acute and chronic poisoning, relief measures.</p> <p>4. Painkillers (analgesics). Classification.</p> <p><u>Opioid (narcotic) analgesics and their antagonists</u>. Classification. <u>Opioid receptor agonists</u>. Mechanism of analgesic action of morphine, pharmacological effects. Comparative characteristics of morphine, promedol, and fentanyl. Indications for use. The concept of neuroleptanalgesia. Side effects. <u>Agonists-antagonists and partial agonists of opioid receptors</u>. Acute and chronic opioid analgesic poisoning, relief measures. Antagonists of opioid analgesics.</p> <p><u>Non-opioid drugs of central action with analgesic activity</u>. <u>Non-opioid (non-narcotic) analgesics of central action (paraaminophenol derivatives)</u>. The mechanism of analgesic action of paracetamol. Indications for use. Side effects. Acute poisoning, relief measures. <u>Drugs from various pharmacological groups with an analgesic component of action</u>. Mechanism of analgesic action, indications for use.</p> <p><u>Analgesics with a mixed mechanism of action (opioid+non-opioid)</u>. Pharmacological characteristics.</p> <p>5. Antiepileptic drugs. Classification. Pharmacological characteristics of drugs used for various forms of epilepsy.</p> <p>6. Antiparkinsonian drugs. Pharmacological correction of extrapyramidal disorders. Classification of antiparkinsonian drugs. Mechanism of action. Side effects.</p> <p>7. Psychotropic drugs</p> <p><u>Antipsychotic drugs (neuroleptics)</u>. Classification. Mechanism of action. Pharmacological effects. Indications for use. Side effects.</p> <p><u>Anxiolytics (tranquilizers)</u>. Classification. Mechanism of action. Pharmacological effects. Indications for use. Side effects, development of drug dependence. Contraindications to use.</p>

			<p><u>Sedatives</u>. Classification. Mechanism of action. Indications for use. Side effects. Chronic bromide poisoning (bromism), treatment measures.</p> <p><u>Antidepressants</u>. Classification. Mechanism of action. Side effects. Contraindications to use.</p> <p><u>Psychostimulants</u>. Classification. Mechanism of action. Pharmacological effects. Indications for use. Side effects, development of drug dependence.</p> <p><u>Nootropic drugs</u>. Mechanism of action. Pharmacological effects. Indications for use.</p> <p>8. Analeptiki. Pharmacological characteristics.</p>
5.	<p>UC-1(IUC-1.2, IUC-1.3), GPC-7 (IGPC-7.1), PC-4 (IPC-4.1, IPC-4.2), PC-8 (IPC-8.1)</p>	<p>Medicines regulating the functions of executive bodies and systems</p>	<p>1. Medications that affect the cardiovascular system:</p> <p><i>Cardiotonic devices</i>. Classification.</p> <p><u>Cardiac glycosides</u>. Definition. Mechanism of cardiotonic action. Cardiac and non-cardiac effects. Indications and contraindications for use. Intoxication with cardiac glycosides, measures of assistance.</p> <p><u>Cardiotonic agents of non-glycoside structure</u>. Mechanisms of cardiotonic action, indications for use.</p> <p><i>Medications used for cardiac arrhythmias (antiarrhythmic drugs)</i>. Classification. Mechanisms of action. Indications for use. Side effects.</p> <p><i>Drugs used for coronary circulatory insufficiency</i></p> <p><u>Drugs used in the treatment of angina pectoris (antianginal agents)</u>. Classification of antianginal drugs.</p> <p><u>Drugs that reduce the need for oxygen in the myocardium and improve its blood supply</u>.</p> <p><u>Organic nitrates</u>. Classification. Mechanism of action and pharmacological effects. Indications for use. Side effects. Contraindications to use.</p> <p><i>Drugs that block calcium channels (calcium antagonists)</i>. Classification. Mechanism of antianginal action. Pharmacological effects. Indications for use. Side effects. <i>Potassium channel activators</i>. Mechanism of antianginal action. Indications for use.</p> <p><i>Various drugs that have antianginal activity</i>. Pharmacological characteristics.</p> <p><u>Drugs that reduce the need for oxygen in the myocardium</u>.</p> <p><u>Beta-blockers</u>. Classification. Mechanism of antianginal action. Pharmacological effects. Indications for use. Side effects. Contraindications to use.</p> <p>Antianginal properties of <i>bradycardic drugs</i>.</p> <p><u>Drugs that increase oxygen delivery to the myocardium</u>.</p> <p><u>Coronary dilators of myotropic action</u>. The mechanism of corona-expanding action. <i>Means of reflex action that eliminate coronary spasm</i>. Indications for use.</p> <p>Application of cardioprotective agents, anti-thromPK and PDis agents, hypolipidemic agents, psychotropic drugs in the complex therapy of angina pectoris.</p> <p><u>Drugs used for myocardial infarction</u>. Pharmacological characteristics.</p> <p><i>Antihypertensive (antihypertensive) agents</i></p> <p>Classification of antihypertensive agents, the effect on different parts of the physiological system of blood pressure regulation.</p> <p><u>1. Drugs that reduce the stimulating effect of adrenergic innervation on the cardiovascular system (neurotropic agents)</u></p> <p><u>Drugs that lower the tone of vasomotor centers (neurotropic antihypertensive agents of central action)</u>. <i>Imidazoline</i></p>

receptor agonists. Mechanism of action. Pharmacological effects. Indications for use. Side effects. Contraindications to use. *Adrenergic agents*. Mechanism of action. Side effects.

Neurotropic antihypertensive agents of peripheral action.

Drugs that block adrenoreceptors (adrenoblockers)

alpha-blockers. Mechanism of antihypertensive action. Indications for use. Side effects.

beta-blockers. Mechanism of antihypertensive action. Indications for use. Side effects.

beta -, alpha-adrenoblockers. Mechanism of antihypertensive action. Indications for use. Side effects.

Drugs that block vegetative ganglia (ganglioblockers). Mechanism of antihypertensive action. Indications for use. Side effects.

Drugs that inhibit adrenergic neurons at the level of presynaptic endings (sympatholytics). Mechanism of action.

2. Agents affecting the systemic humoral regulation of blood pressure

Agents affecting the renin-angiotensin system

Inhibitors of angiotensin II synthesis (angiotensin-converting enzyme inhibitors). Mechanism of action. Pharmacological effects. Indications for use. Side effects. Contraindications to use.

Angiotensin receptor blockers (AT1). Mechanism of action. Pharmacological effects. Indications for use. Side effects. Contraindications to use.

3. Myotropic drugs (myotropic agents)

Agents that affect ion channels

Agents that block calcium channels. Mechanism of antihypertensive action. Indications for use. Side effects.

Potassium channel activators. Mechanism of antihypertensive action. Indications for use. Side effects.

Nitric oxide donors. Mechanism and features of action.

Various myotropic agents. Features of action and application.

4. Drugs that affect water-salt metabolism (diuretics). Use in arterial hypertension.

Combined use of antihypertensive agents with different localization and mechanism of action.

2. Medicines that affect the functions of the respiratory system. Classification.

Respiratory stimulants. Classification. Mechanism of action. Features of the application.

Antitussive remedies. Classification. Mechanism of action. Indications for use. Side effects.

Expectorants. Classification. Mechanism of action.

Medications used for bronchospasms. Classification. Mechanism of action. Indications for use. Side effects. Contraindications to use.

Medications used for acute respiratory failure.

3. Medicines that affect the functions of the digestive system:

Means that affect the appetite. Means that stimulate the appetite. Mechanism of action. Indications for use. *Means that reduce appetite*. Use in the treatment of obesity.

Drugs that affect the function of the salivary glands. Indications for the use of drugs that reduce the secretion of salivary glands.

Means used for disorders of the function of the stomach glands

		<p><u>Means that enhance the secretion of the gastric glands.</u> <u>Means of substitution therapy.</u> Indications for use.</p> <p><u>Drugs that lower the secretion of gastric glands.</u> Classification. The mechanism of action of proton pump inhibitors, agents that block histamine H₂ receptors, agents that block cholinergic receptors, prostaglandin preparations and their synthetic derivatives. Indications for use. Side effects.</p> <p>Antacids. Classification. Mechanism of action. Comparative characteristics of antacids (severity, rate of development and duration of the antacid effect; side effects).</p> <p>Gastroprotectors. Classification. Mechanism of action. Indications for use. Side effects.</p> <p>Emetics and antiemetics. Classification. Mechanism of action. Indications for use. Side effects.</p> <p>Hepatoprotective agents. Mechanism of action. Indications for use.</p> <p>Choleretic agents. Classification. Mechanism of action. Indications for use. Side effects. Contraindications to use.</p> <p>Means that promote the dissolution of gallstones (xcholelolytic agents). Mechanism of action. Features of action and application.</p> <p>Drugs used for disorders of the excretory function of the pancreas. Means of substitution therapy for insufficient pancreatic function.</p> <p>Drugs that affect the motility of the gastrointestinal tract.</p> <p><u>Drugs that inhibit the motility of the gastrointestinal tract.</u> Indications for use.</p> <p><u>Products that enhance the motility of the gastrointestinal tract.</u> Indications for use. <u>Laxatives.</u> Classification by mechanism and preferred localization of action. Mechanism and features of action. Indications for use. Side effects. Contraindications to use.</p> <p>4. Drugs that affect hematopoiesis:</p> <p>Drugs that affect erythropoiesis. Classification.</p> <p><u>Drugs that stimulate erythropoiesis.</u></p> <p><u>Drugs used for hypochromic anemia.</u></p> <p><u>Iron preparations.</u> Classification. Features of pharmacokinetics. Influence on hematopoiesis. Side effects.</p> <p><u>Preparations of cobalt.</u></p> <p>The use of recombinant human erythropoietin preparations in anemia, that occurs in some chronic diseases.</p> <p><u>Drugs used for hyperchromic anemia.</u></p> <p><u>Preparations of cyanocobalamin and folic acid.</u> Mechanism of influence on erythropoiesis. Indications for use.</p> <p><u>Drugs that inhibit erythropoiesis.</u> Features of the application.</p> <p>Drugs that affect leukopoiesis.</p> <p><u>Drugs that stimulate leukopoiesis.</u> Preparations of growth factors regulating leukopoiesis. Mechanism of action. Indications for use.</p> <p><u>Drugs that inhibit leukopoiesis.</u> Indications for use.</p> <p>5. Drugs that affect platelet aggregation, blood clotting, and fibrinolysis:</p> <p>Agents used for the prevention and treatment of thrombosis and PDis</p> <p><u>Agents that reduce platelet aggregation (antiplatelet agents).</u> Classification. Mechanism of action. Indications for use. Side effects.</p> <p><u>Drugs that reduce blood clotting (anticoagulants).</u> Classification. Comparative characteristics of direct and indirect</p>
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			<p>anticoagulants. Indications for use. Side effects. <u>Fibrinolytic (thrombolytic) agents.</u> Mechanism of action. Indications for use. Side effects. <i>Drugs that help stop bleeding (hemostatics)</i> <u>Drugs that increase blood clotting.</u> Features of the application. <u>Antifibrinolytic agents.</u> Mechanism of action. Indications for use. 6. Medications that affect the myometrium: <i>Drugs that mainly affect the contractile activity of the myometrium and enhance contractile activity (rhodostimulants)</i> <u>Reducing contractile activity (tocolytic agents)</u> <i>Drugs that mainly increase the tone of the myometrium</i> <i>Drugs that lower the tone of the cervix</i> Mechanism of action. Pharmacological effects. Indications for use. Side effects. 7. Diuretics (diuretics). Classification. Mechanism of action. Pharmacological effects. Indications for use. Side effects. Contraindications to use.</p>
6.	UC-1 (IUC-1.2, IUC-1.3), GPC-7 (IGPC-7.1), PC-4 (IPC-4.1, IPC-4.2), PC-8 (IPC-8.1)	Medicines regulating metabolic processes	<p>1. Hormonal drugs. Classification. Mechanism of action. <i>Hormonal preparations of protein, peptide structure, amino acid derivatives of hypothalamic and pituitary hormones.</i> Pharmacological effects. Indications for use. <i>Preparations of epiphysis hormones.</i> Pharmacological effects. Indications for use. <i>Thyroid hormone preparations and antithyroid drugs. Calcitonin</i> <u>Preparations of thyroid hormones.</u> Effect on metabolism. Other pharmacological effects. Indications for use. <u>Antithyroid drugs.</u> Classification. Mechanism of action. Indications for use. Side effects. <u>Calcitonin.</u> Pharmacological effects. Indications for use. <i>A parathyroid hormone preparation.</i> Effect on calcium and phosphorus metabolism. Indications for use. <i>Pancreatic hormone preparations and synthetic antidiabetic agents</i> <u>Replacement therapy agents (insulin preparations).</u> Classification. Mechanism of action, effect on metabolism. Side effects. <u>Synthetic antidiabetic agents.</u> Classification. <u><i>Drugs that stimulate the release of endogenous insulin (blockers of ATP-dependent K⁺ channels of betacells of pancreatic Langerhans islets - derivatives of sulfonylureas, benzoic acid, and D-phenylalanine; and nkretinomimetics - nreceptor repair agents (agonists of incretin GLP-1 receptors), inhibitors of dipeptidyl peptidase-4, which inactivates GLP-1 incretin).</i></u> <u><i>Drugs that inhibit gluconeogenesis and promote the absorption of glucose into tissues.</i></u> <u><i>Drugs that increase the sensitivity of tissues to insulin.</i></u> <u><i>Drugs that inhibit the absorption of glucose in the small intestine.</i></u> <u><i>Inhibitors of glucagon production.</i></u> Mechanism of action. Indications for use. Side effects. <u>Glucagon.</u> Main effects. Indications for use.</p>

		<p><i>Hormonal preparations of the steroid structure</i> <i>Preparations of hormones of the adrenal cortex (corticosteroids)</i> <u>Glucocorticoid preparations.</u> Mechanism of action. Фармакологические эPharmacological effects. Indications for use. Side effects. <u>Mineralocorticoid preparations.</u> Mechanism of action. Фармакологические эPharmacological effects. Indications for use. Side effects. Mineralocorticoid antagonists. <i>Preparations of sex hormones, their derivatives, synthetic substitutes and antagonists</i> <u>Preparations of hormones of the female sex glands.</u> <u>Estrogenic and anti-estrogenic drugs.</u> <u>Progestogenic (progestogenic) and anti-gestational drugs.</u> <u>Contraceptives for enteral administration and implantation.</u> Mechanism of action. Pharmacological effects. Indications for use. Side effects. Contraindications to use. <u>Preparations of hormones of the male sex glands (androgens) and antiandrogenic agents.</u> Mechanism of action. Фармакологические эPharmacological effects. Indications for use. Side effects. <u>Anabolic steroids.</u> Фармакологические эPharmacological effects. Indications for use. Side effects. Contraindications to use. 2. Vitamin <i>reparations Preparations of water-soluble vitamins.</i> <u>Preparations of vitamins of group B.</u> <u>Preparations of vitamin C.</u> <u>Preparations of vitamin R.</u> Pharmacological effects. Indications for use. Side effects. <i>Preparations of fat-soluble vitamins.</i> <u>Vitamin</u> <u>A preparations Vitamin D preparations</u> <u>Preparations of vitamin E.</u> <u>Preparations of vitamin K.</u> Pharmacological effects. Indications for use. Side effects. 3. Medications used for hyperlipoproteinemia (anti-atherosclerotic agents). Classification. Mechanism of action. Influence on the blood lipid profile. Use in various types of primary hyperlipoproteinemia. Side effects.</p>
7.	UC-1 (IUC-1.2, IUC-1.3), GPC-7 (IGPC-7.1), PC-4 (IPC-4.1, IPC-4.2), PK-8 (IPC-8.1)	<p>Drugs that inhibit inflammation and affect immune processes</p> <p>1. , Anti-inflammatory drugs. The main focus of action of anti-inflammatory drugs. <i>Steroid anti-inflammatory drugs.</i> Mechanism of anti-inflammatory action. Indications for use. Side effects. <i>Nonsteroidal anti-inflammatory drugs.</i> Classification. Mechanism of action. Indications for use. Side effects. Contraindications to use. 2. Agents that affect immune processes <i>Anti-allergic agents</i> <u>Means used for immediate type of allergy (hypersensitivity).</u> Agents that inhibit the release of histamine and other basal substances from sensitized mast cells and</p>

			<p>basophils (glucocorticoids, cromoline-sodium, ketotifen, beta-adrenomimetics, eufillin).</p> <p>Drugs that prevent the interaction of free histamine with sensitive tissue receptors (antihistamines - blockers of histamine H1-receptors).</p> <p>Drugs that eliminate common manifestations of allergic reactions (anaphylactic shock) (adrenomimetics, bronchodilators).</p> <p>Drugs that reduce tissue damage (steroid anti-inflammatory drugs).</p> <p>Mechanism of anti-allergic action. Pharmacological effects. IIPMS for use. Side effects.</p> <p><u>Drugs used for delayed hypersensitivity reactions. Immunosuppressants.</u> Mechanism of action. Indications for use. Side effects.</p> <p>Immunostimulating agents. Mechanism of action. Indications for use. Side effects.</p>
8.	<p>UC-1(IUC-1.2, IUC-1.3),</p> <p>GPC-7 (IGPC-7.1),</p> <p>PC-4 (IPC-4.1, IPC-4.2),</p> <p>PC-8 (IPC-8.1)</p>	Antimicrobial and antiparasitic agents	<p>1. Antiseptic and disinfectant products. Definition. Requirements for antiseptic and disinfectant products. Classification.</p> <p>Halogen-containing compounds. Mechanism and features of action. Pharmacological effects. Indications for use. Side effects. Contraindications to use.</p> <p>Oxidizing agents. Mechanism and features of action. Indications and contraindications for use.</p> <p>Acids and alkalis. Mechanism and features of action. Pharmacological effects. Indications for use. Side effects. Contraindications to use.</p> <p>Metal salts. Mechanism and features of action. Pharmacological effects. Indications for use.</p> <p>Aldehydes. Mechanism and features of action.</p> <p>Alcohols. Mechanism and features of action. Indications for use.</p> <p>Phenols. Mechanism and features of action.</p> <p>Dyes. Mechanism and features of action.</p> <p>Detergents. Mechanism and features of action.</p> <p>Tar, resins, petroleum products, mineral oils, synthetic balms, sulfur-based preparations. Features of the action. Indications for use.</p> <p>Antiseptic products of natural origin. Mechanism and features of action. Indications for use.</p> <p>2. Antibacterial chemotherapeutic agents:</p> <p>Antibiotics</p> <p>Definition. Classifications. Mechanisms of action. Principles of rational antimicrobial therapy. Side effects.</p> <p><u>Penicillins.</u> Classification. Mechanism of action. Comparative characteristics of biosynthetic and semisynthetic penicillins. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivindications for use.</p> <p><u>Cephalosporins.</u> Classification. Mechanism of action. Comparative characteristics of cephalosporins I-IY generations. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivindications for use.</p> <p><u>Carbapenems.</u> Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivindications for use.</p> <p><u>Monobactams.</u> Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects.</p>

		<p>Protivoindications for use.</p> <p><u>Macrolides and azalides</u>. Classification. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><u>Tetracyclines</u>. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><u>Group chloramphenicol (levomycetina)</u>. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><u>Aminoglycosides</u>. Classification. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><u>Polymyxins</u>. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><u>Lincosamides</u>. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><u>Glycopeptides</u>. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><u>Fusidic acid</u>. Mechanism of action. Spectrum of action. Features of pharmacokinetics. Indications for use. Side effects. Protivoindications for use.</p> <p><i>Sulfonamide preparations</i> Classification. Mechanism of action. Indications for use. Side effects.</p> <p><i>Quinolone derivatives</i> Mechanism of action. Spectrum of action. Indications for use. Side effects. Contraindications to use. Letter of the Ministry of Health of the Russian Federation No. 20-3/2114 dated 12.11.2018 on amendments to the instructions for the use of fluoroquinolones.</p> <p><i>Synthetic antibacterial agents of different chemical structures</i> -Derivatives of 8-hydroxyquinoline, nitrofurans, quinoxalines, oxazolidinones. Mechanism of action. Spectrum of action. Indications for use. Side effects.</p> <p><i>Antisiphilitic agents</i>. Mechanism of action. Features of action and application. Side effects.</p> <p><i>Anti-tuberculosis drugs</i>. Classification. Anti-tuberculosis drugs of group I, group II группы, III, and group III. Mechanism of action. Spectrum of action. Indications for use. Side effects.</p> <p>3. Antiviral agents Classification.</p> <p><i>Antiviral agents used in the treatment of HIV infection</i>. Classification. Mechanism and features of action. Side effects.</p> <p><i>Antiherpetic agents</i>. Mechanism of action. Indications for use. Side effects.</p> <p><i>Antiviral agents used for cytomegalovirus infection</i>. Mechanism of action. Indications for use. Side effects.</p> <p><i>Anti-influenza drugs</i>. Classification. Mechanism of action. Indications for use. Side effects.</p> <p><i>Antiviral agents used in the treatment of viral hepatitis B and C</i>. Mechanism of action. Indications for use. Side effects.</p> <p>4. Antiprotozoal agents <i>Means used for the prevention and treatment of malaria</i>. Hematoschizotropic agents. Histoshizotropic agents.</p>
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			<p>Gamontotropic agents.</p> <p>Drugs used in the treatment of amoebiasis. The main focus of action of anti-amoebic drugs.</p> <p>Drugs used in the treatment of giardiasis, trichomoniasis, toxoplasmosis, balantidiasis, leishmaniasis, trypanosomiasis.</p> <p>Pharmacodynamics and pharmacokinetics. Indications for use. Side effects.</p> <p>5. Antifungal agents</p> <p>Classification.</p> <p>Drugs used in the treatment of systemic mycoses. Mechanism and spectrum of action. Side effects.</p> <p>Drugs used in the treatment of dermatomycosis. Mechanism of action. Spectrum of action. Indications for use. Side effects.</p> <p>6. Anthelmintic (anthelmintic) agents.</p> <p>Drugs used in the treatment of intestinal helminthiasis (nematodosis-ascariasis, cestodosis, trematodosis). Pharmacodynamics and pharmacokinetics. Indications for use. Side effects.</p> <p>Drugs used in the treatment of extra-intestinal helminthiasis (nematodoses and trematodoses). Pharmacodynamics and pharmacokinetics. Indications for use. Side effects.</p>
9	<p>UC-1(IUC-1.2, IUC-1.3),</p> <p>GPC-7 (IGPC-7.1),</p> <p>PC-4 (IPC-4.1, IPC-4.2),</p> <p>PC-8 (IPC-8.1)</p>	Antitumor drugs	<p><i>Antitumor (antiblastoma) agents</i></p> <p><i>Classification of antiblastoma agents.</i></p> <p><i>Alkylating agents and similar preparations</i></p> <p><i>Antimetabolites</i></p> <p><i>Antibiotics</i></p> <p><i>Herbal remedies</i></p> <p><i>Hormonal drugs and hormone antagonists</i></p> <p><i>Enzymes</i></p> <p><i>Cytokines</i></p> <p><i>Monoclonal antibodies</i></p> <p><i>Protein kinase inhibitors</i></p> <p><i>Mechanism of action. Indications for use. Side effects.</i></p> <p><i>Auxiliaries used in the chemotherapy of tumor diseases, in order to prevent and neutralize the side effects of antiblastoma agents.</i></p>

5. Volume of the academic discipline and types of academic work

Type of educational work	Labor intensity		Labor intensity (AH) in semester	
	volume in credit units (CU)	volume in academic hours (AH)	5	6
Classroom work, including	3.67	132	66	66
Lectures (L)	0.78	28	14	14

Laboratory practicum (LP)*	does not provide			
Practicals (P)	2,89	104	52	52
Seminars (S)	does not provide			
Student's individual work (SIW)	2,33	84	42	42
Mid-term assessment				
credit/exam (<i>specify the type</i>)	1	36	-	36
TOTAL LABOR INTENSITY	7	252	108	144

6. Content of the academic discipline

6.1. Sections of the discipline and types of academic work

№	Name of the section of the academic discipline	Types of academic work* (in AH)					
		L	LP	P	S	SIW	total
1.	General formulation	-	-	12	-	5	17
2.	General pharmacology General principles of treatment of acute poisoning with pharmacological substances	2	-	4		5	11
3.	Medicinal products regulating the functions of the peripheral nervous system	4	-	10		5	19
4.	Medicinal products regulating the functions of the central nervous system	4	-	11		22	37
5.	Medicinal products regulating the functions of executive organs and systems	8	-	31		5	44
6.	Medicinal products regulating metabolic processes	4	-	8		14	26
7.	Drugs that inhibit inflammation and affect immune processes	2	-	7		8	17
8.	Antimicrobial and antiparasitic agents	4	-	21		18	43
9	Antitumor agents					2	2
	TOTAL	28	-	104		84	216

* - L – lectures; LP – laboratory practicum; P – practicals; S – seminars; SIW – student's individual work.

6.2. Thematic schedule of educational work types:

6.2.1 Thematic schedule of lectures

№	Name of lecture topics	Volume in AH	
		5 semester	6 semester
1.	General pharmacology	2	
2.	Agents affecting cholinergic synapses	2	
3.	Agents affecting adrenergic synapses	2	
4.	Painkillers (analgesics)	2	
5.	Antipsychotics (neuroleptics). Anxiolytics (tranquilizers). Sedatives	2	
6.	Antihypertensive (antihypertensive) agents	2	
7.	Diuretics (diuretics)	2	
8.	Drugs that affect hematopoiesis. Drugs that affect platelet aggregation, blood clotting and fibrinolysis		2
9.	Drugs that affect the functions of the respiratory		2
10.	Hormonal preparations of protein, peptide structure, amino acid derivatives		2
11.	Hormonal preparations of steroid structure		2
12.	Non-steroidal anti-inflammatory drugs		2
13.	Antibiotics		2
14.	Antiviral agents. Antifungal agents		2
	TOTAL (total – 28 AH)	14	14

6.2.2. The thematic plan of laboratory practicums (*if this type of classes is stipulated in the curriculum*)

№	Name of laboratory practicums	Volume in AH	
		semester 5	semester 6
1.	Introduction. Hard and soft dosage forms.	5	
2.	Liquid dosage forms	5	
3.	Border control. General pharmacology.	6	

4.	Agents that affect cholinergic synapses.	5	
5.	Agents that affect adrenergic synapses.	5	
6.	Narcotic analgesics. Antipsychotic drugs (neuroleptics). Anxiolytics (tranquilizers). Sedatives.	5	
7.	Psychostimulants. Antidepressants. Nootropic drugs. Analeptics. Border control on topics #3-7.	6	
8.	Drugs used for coronary circulatory insufficiency	5	
9.	Antihypertensive (antihypertensive) drugs. Diuretics (diuretics). Final semester testing on practical training topics and topics for self-study (during extracurricular hours).	5	
10.	Cardiotonic devices. Border control on topics # 8-10.	5	
11.	Drugs that affect the functions of the digestive		5
12.	Drugs that affect hematopoiesis, platelet aggregation, blood clotting and fibrinolysis		5
13.	Drugs that affect the functions of the respiratory system. 11-13.		6
14.	Hormonal preparations of protein and peptide structure, amino acid derivatives.		5
15.	Hormonal preparations of the steroid structure. Nonsteroidal anti-inflammatory drugs.		5
16.	Drugs that affect immune processes. Border control on topics # 14-16.		5
17.	Antibiotics		6
18.	Synthetic antibacterial agents of different chemical structures. Sulfonamide preparations		5
19.	, Antiseptics and disinfectants. Final (semester) testing.		5
20.	Antiviral drugs. Antifungal agents. Border control on topics # 17-20.		5
	TOTAL (total – 104 AH)	52	52

6.2.3. Thematic plan of practicals – not provided

6.2.4. Thematic plan of seminars – not provided

6.2.5. Types and topics of student's individual work (SIW)

№ n /	a Section of the discipline	Types and topics	Volume in AH	
			semester	
			5	6
1.	General prescriptions	Work with literature sources, performing tasks in the form of writing prescriptions for various dosage forms; preparing for classes in an interactive form; preparing for border control; working with electronic educational resources (SDS, EBS, etc.)	5	
2.	General pharmacology	Working with literature sources, including lecture material; preparing for classes in an interactive form; preparing for border control; working with electronic educational resources (SDS, EBS, etc.). Self-study topic: - "General principles of treatment of acute drug poisoning".	5	
3.	Medicines that regulate the functions of the peripheral nervous system	Working with literature sources, including lecture material; performing tasks in the form of writing prescriptions in accordance with the "List of drugs for registration of prescription notebooks and border controls"; preparing for classes in an interactive form; preparing for border control, working with electronic educational resources (SDO, EBS, etc.). Self-study topic: - "Agents affecting afferent innervation".	5	
4.	Medicines that regulate the functions of the central nervous system	Working with literature sources, including lecture material; performing tasks in the form of writing prescriptions in accordance with the "List of drugs for registration of prescription notebooks and border controls"; preparing for classes in an interactive form; preparing for border control, working with electronic educational resources (LMS, EBS, etc.). Topics for self-study: - "Ethyl alcohol"; - "Sleeping pills"; - "Antiepileptic drugs"; - "Antiparkinsonian drugs"; - "Drugs for anesthesia"	22	
5.	Medicines that regulate the functions of executive bodies and systems	Work with literature sources, including lecture material, performing tasks in the form of prescribing in accordance with the requirements of the Ministry of Health of the Russian Federation. with the " List preparations for registration of prescription notebooks and border controls", preparation for classes in an interactive form; preparation for border control, work with electronic educational resources (SDS, EBS, etc.). Self-study topic: - "Antiarrhythmic drugs".	5	
6.	Medicines that regulate metabolic processes	Working with literature sources, including lecture material; performing tasks in the form of writing prescriptions in accordance with the "List of drugs for registration of prescription notebooks and border controls", preparing for classes in an interactive form; preparing for border control, working with electronic educational resources (EDS, EBS, etc.).		14

		Self-study topics: - "Medicines affecting the myometrium"; - "Anti-Atherosclerotic drugs"		
7.	Medicines that inhibit inflammation and affect immune processes	Work with literature sources, including lecture material; perform tasks in the form of writing prescriptions in accordance with the "List of drugs for registration of prescription notebooks and border controls"; prepare for classes in an interactive form; prepare for border control, work with electronic educational resources (SDS, EBS, etc.).		8
8.	Antimicrobial and antiparasitic agents	Working with literature sources, including lecture material, performing tasks in the form of writing prescriptions in accordance with the "List of drugs for registration of prescription notebooks and border controls"; preparing for classes in an interactive form; preparing for border control, working with electronic educational resources (SDS, EBS, etc.). etc.). Topics for self-study: – "Anthelmintic agents"; – "Antiphilic agents"; – "Antiprotozoal agents"		18
9.	Antitumor agents	Working with literature sources, including lecture material, performing tasks in the form of writing prescriptions in accordance with the "List of drugs for registration of prescription notebooks and border controls"; preparing for classes in an interactive form; preparing for border control, working with electronic educational resources (SDS, EBS, etc.). etc.).		2
TOTAL (total-84 AH)			42	42

7. Types of assessment formats for ongoing monitoring and mid-term assessment

№ n /	№ a no. of the semester	Control forms	Name of the discipline section	Assessment tools		
				types	number of control questions (questions in the task)	number of options (test tasks)
1.	5	<ul style="list-style-type: none"> • CIW* • CTC • Pr.A-exam at the end of the 6th semester 	General recipe prescription writing	Short-term control work on the recipe (current control)	5	2
				Written control work on the section "General recipe" (border control)	12	6
				Exam questions	1	total questions on the section-11
2.	5	<ul style="list-style-type: none"> • CIW* • CTC 	General pharmacology	Tasks in the test form	free sample	total for the section-33+SIW

		<ul style="list-style-type: none"> • Pr.A-exam at the end of the 6th semester 		Control work (boundary control)	2	5
				Exam questions	1	total questions for the section-13
3.	5	<ul style="list-style-type: none"> • CIW* • CTC • Pr.A-exam at the end of the 6th semester 	Medicines that regulate the functions of the peripheral nervous system	Tasks in the test form	free sample	total for the section-138+ SIW
				Short-term control work on the prescription (current control)	5	2
				Control work: written control work on prescription; individual survey (border control)	7/2	4/12
				Exam questions	1	total questions on the section-11
				List of exam drugs for prescribing	1	13
				Situational tasks	1	10
4.	5	<ul style="list-style-type: none"> • CIW* • CTC • Pr.A-exam at the end of the 6th semester 	Medicines that regulate the functions of the central nervous system	Tasks in the test form	free sample	total for the section-162+ SIW
				Short-term control work on the prescription (current control)	5	2
				Control work: written control work on prescription; individual survey (border control)	7/2	5/53
				Exam questions	1	total questions on the section-14
				List of exam drugs for prescribing	1	12
				Situational tasks	1	5
5.	6	<ul style="list-style-type: none"> • CIW* • CTC • Pr.A-exam at the end of the 6th semester 	Medicines that regulate the functions of executive bodies and systems	Tasks in the test form	free sample	of everything in the section-239+ SIW
				Short-term control work on prescription (current control)	5	2
				Abstract	2	1
				Control work: written control work on prescription; individual survey (border control)	7/2	5/66
				Exam questions	1	total questions for the section-31
				List of exam drugs for prescribing	1	25

				Situational tasks	1	13
6.	6	<ul style="list-style-type: none"> • CIW* • CTC • Pr.A-exam at the end of the 6th semester 	Medicines that regulate metabolic processes	Tasks in the test form	free sample	of everything in the section-60+ SIW
				Short-term control work on the recipe (current control)	5	2
				Control work: written control work on prescription; individual survey (border control)	7/2	5/34
				Exam questions	1	total questions for section-16
				List of exam drugs for prescribing	1	6
				Situational tasks	1	4
7.	7	<ul style="list-style-type: none"> • CIW* • CTC • Pr.A-exam at the end of the 6th semester 	Drugs that inhibit inflammation and affect immune processes	Tasks in the test form	free sample	of all in the section-62+ SIW
				Short-term control work on the recipe (current control)	5	2
				Test work: written test work on prescription; individual survey (border control)	7/2	5/8
				Exam questions	1	total questions for section-3
				List of exam drugs for prescribing	1	7
				Situational tasks	1	1
8.	7	<ul style="list-style-type: none"> • CIW* • CTC • Pr.A-exam at the end of the 6th semester 	Antimicrobial and antiparasitic agents	Tasks in the test form	free selection	of all sections-162+ SIW
				Short-term control work on the recipe (current control)	5	2
				Test work: written test work on prescription; individual survey (border control)	7/2	5/39
				Exam questions	1	total questions for the section-18
				List of exam drugs for prescribing	1	15
				Situational tasks	1	7

Note: *CIW - control of the student's independent work, CTC- control of the topicdevelopment, Pr. A-intermediateая attestation.

8. Educational, methodological and informational support for mastering the academic discipline (printed, electronic publications, the Internet and other network resources)

8.1. Key literature references

№ n / /	Name according to bibliographic requirements	Number of copies	
		Department	library
1.	Kharkevitch D. A. Pharmacology : textbook for medical students : translation of Russian textbook, 12th edition, revised and improved / D. A. Kharkevitch. – 2nd ed. – М. : ГЭОТАР-Медиа, 2019. – 680 p. : ил. – ISBN 978-5-9704-4985-1. Ссылка на библиографическое описание: http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=217114&idb=0	5	49
2.	Sorokina, Y. A. General pharmacology of cholinergic drugs : tutorial / Y. A. Sorokina, A. L. Barsuk, G. V. Rudakova. – N. Novgorod : Gladkova O. V., 2022. – 1 файл (6.66 Мб). – ISBN 978-5-93530-582-6. – Текст : электронный. Ссылка на библиографическое описание: http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=231339&idb=0	100	
3.	Sorokina, Y. A. General pharmacology of adrenergic drugs : tutorial / Y. A. Sorokina, A. L. Barsuk, G. V. Rudakova. – N. Novgorod : Gladkova O. V., 2022. – 1 файл (2.15 Мб). – ISBN 978-5-93530-583-3. – Текст : электронный. Ссылка на библиографическое описание: http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=231337&idb=0	100	
4.	Сорокина, Ю. А. Prescription writing = Выписывание рецептов : учебное пособие / Ю. А. Сорокина, А. Л. Барсук, Г. В. Рудакова. – Н. Новгород : Ремедиум Приволжье, 2020. – 1 файл (1.57 Мб). – ISBN 978-5-906125-78-1. – Текст : электронный. Ссылка на библиографическое описание: http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=197653&idb=0	100	
5	General pharmacology of cardiovascular drugs = Фармакология лекарственных средств, влияющих на сердечно-сосудистую систему : tutorial / ed. by Yu. A. Sorokina. – Н. Новгород : Гладкова О. В., 2021. – 104 p. – ISBN 978-5-93530-560-4. Ссылка на библиографическое описание: http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=216716&idb=0	100	

8.2. Further reading

№ n / /	Name according to bibliographic requirements	Number of copies	
		Department	library
1.	Basic & clinical pharmacology / B. G. Katzung ; Katzung B. G. – 10th ed. – PK and PDton : McGraw-Hill, 2007. – 1179 с. : ил. мяг. – ISBN 978-0-07-126093-0. Ссылка на библиографическое описание: http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=33926&idb=0	1	
2.	Color atlas of pharmacology / D. Bieger, L. Hein, H. Lullmann, K. Mohr ; Lullmann	1	

Н. ; Mohr K. ; Hein L. ; Bieger D. – 3rd ed. – Stuttgart : Thieme, 2005. – 402 с. : ил. м.г. – ISBN 3-13-781703-X. Ссылка на библиографическое описание: http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=32972&idb=0	
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8.3. Electronic educational resources for teaching academic subjects

8.3.1. Internal Electronic Library System of the University (IELSU)

Name of the electronic resource	Brief description (content)	Access conditions	Number of users
Internal Electronic Library System (EBS) http://nbk.pimunn.net/MegaPro/Web	Works of the university's teaching staff: textbooks, study guides, problem collections, methodological manuals, laboratory works, monographs, collections of scientific papers, scientific articles, dissertations, dissertation abstracts, patents	From any computer and mobile device using an individual login and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	Not restricted

8.3.2. Electronic educational resources acquired by the University

№	Name of the electronic resource	Brief description (content)	Access conditions	Number of users
	EBS " Student's Consultant " (Electronic database "Student's Consultant". Database " Medicine. Healthcare (VO) and " Medicine. Healthcare (SPE)") http://www.studmedlib.ru	Educational literature, additional materials (audio, video, interactive materials, test tasks) for higher medical and pharmaceutical education	From any computer and mobile device using an individual username and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	<i>unlimited</i>
	Database " Doctor's Consultant. Electronic Medical Library" https://www.rosmedlib.ru	National clinical guidelines, training manuals, monographs, atlases,	From any computer and mobile device using an	<i>unlimited</i>

		pharmaceutical reference books, audio and video materials, ICD-10 and ATX	individual login and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	
	Electronic library system "Bukap" https://www.books-up.ru	Educational and scientific medical literature of Russian publishing houses, including translations of foreign publications. Within the framework of the "Big Medical Library" project, publications of participating universities are available	from any computer and mobile device using an individual login and password; access is automatic from university computers. Publications from the "My books" section are available for reading. Access mode: http://nbk.pimunn.net/MegaPro/Web	<i>unlimited</i>
	YURAYT Educational Platform https://urait.ru	https://urait.ru A collection of publications on psychology, ethics, and conflict	management from any computer or mobile device using an individual username and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	<i>unlimited</i>
	Electronic periodicals in the database "Scientific Electronic Library eLibrary" https://elibrary.ru	Electronic medical journals	From university computers. Access mode: https://elibrary.ru	<i>unlimited</i>
	Integrated Information and library system (IBS) of the scientific and educational medical cluster of the Volga Federal District – "Srednevolzhsky" (contract on a free basis)	Electronic copies of scientific and educational publications from the collections of libraries participating in the scientific and educational medical cluster of the Volga Federal District "Srednevolzhsky"	Access using an individual username and password from any computer or mobile device. Access mode: websites of libraries participating in the project	<i>unlimited</i>

	Electronic reference and legal system "Consultant Plus" (contract on a free basis) http://www.consultant.ru	Regulatory documents regulating the activities of medical and pharmaceutical institutions	From the computers of the scientific library. Access mode: http://www.consultant.ru/He	<i>unlimited</i>
	National Electronic Library (NEB) (contract on a free basis) http://НЭБ.рф	Electronic copies of publications (including scientific and educational ones) on a wide range of knowledge	Scientific and educational works that have not been reprinted in the last 10 years are publicly available. Works restricted by copyright – from the computers of the scientific library. Access mode: http://НЭБ.рф	<i>unlimited</i>

8.3.3 Open access resources

№	Name of the electronic resource	Brief description (content)	Access conditions
	PubMed https://www.ncbi.nlm.nih.gov/pubmed	Search engine of the National Library of Medicine of the USA for the databases "Medline", "PreMedline"	From any computer or mobile device. Access mode: https://www.ncbi.nlm.nih.gov/pubmed
	Directory of Open Access Journals http://www.doaj.org	Directory for open access to a full-text collection of periodicals	from any computer or mobile device. Access mode: http://www.doaj.org
	Directory of open access books (DOAB) http://www.doabooks.org	A directory of open access to a full-text collection of scientific books	from any computer or mobile device. Access mode: http://www.doabooks.org

9. Material and technical support for mastering an academic discipline

9.1. List of premises for classroom activities for the discipline

For conducting lectures on the basis of the academic building No. 2 (BFC), there are:

- 2 lecture halls.

For conducting practical classes on the basis of the educational building No. 2 (BFC), there are:

- 6 study rooms with an area of 36,8, 26, 23,6, 21,2, 21,2, 21 m².

9.2. List of equipment for classroom activities for the discipline

Name	quantity
Based on academic building No. 2:	
Multimedia projectors:	
- Epson EMP-S3	1
-Epson	1
-BEAQMS	1
Laptops:	
- Fujitsu Siemens	1
- Lenovo	1
- Lenovo Idea Pad	1
- Lenovo Think Book	2
LCD TV	4
Screens	3
Whiteboards	5
Marker boards	4
Stands:	
- on the organization of the educational process at the department	1
-pharmacodynamics and pharmacokinetics of medicines	16

9.3. A set of licensed and freely distributed software, including domestic production

Item no.	Software	number of licenses	Type of software	Manufacturer	Number in the unified register of Russian software	Contract No. and date
1	Wtware	100	Thin Client Operating System	Kovalev Andrey Alexandrovich	1960	2471/05-18 from 28.05.2018
2	MyOffice is Standard. A corporate user license for educational organizations, with no expiration date, with the right to receive updates for 1 year.	220	Office Application	LLC "NEW CLOUD TECHNOLOGIES"	283	without limitation, with the right to receive updates for 1 year.
3	LibreOffice		Office Application	The Document Foundation	Freely distributed software	
4	Windows 10 Education	700	Operating systems	Microsoft	Azure Dev Tools for Teaching Subscriptio	

					n	
5	Yandex. Browser		Browser	«Yandex»	3722	
6	Subscription to MS Office Pro for 170 PCs for FGBOU VO "PIMU" of the Ministry of Health of Russia	170	Office Application	Microsoft		23618/HN100 30 LLC "Softline Trade" from 04.12.2020

10. List of changes to the working program (to be filled out by the template)

Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation
(FSBEI HE "PRMU" of the Ministry of Health of Russia)

Department of
Name of the department

CHANGE REGISTRATION SHEET

working program for the academic discipline
NAME OF THE ACADEMIC DISCIPLINE

Field of study / specialty / scientific specialty: _____

(code, name)

Training profile: _____

(name) - for master's degree programs

Mode of study: _____

full-time/mixed attendance mode/extramural

Position	Number and name of the program section	Contents of the changes made	Effective date of the changes	Contributor's signature
1				

Approved at the department meeting

Protocol No. ____ of _____ 20__

Head of the Department

department name, academic title

signature

print name