

FEDERAL STATE BUDGET EDUCATIONAL INSTITUTION  
OF HIGHER EDUCATION  
"ROSTOV STATE MEDICAL UNIVERSITY"  
MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION

*Faculty of Education of foreign students, residents and postgraduates*

Supervisor  
educational program

(signature)

CONFIRM

/ E.S. Belousova /

(FULL NAME.)

" 30 " 2023



**DISCIPLINE WORKING PROGRAM**

**PHARMAKOLOGY**

Speciality 31.05.01 General medicine

Form of education full-time

Rostov-on-Don  
2023

## 1. GOALS AND OBJECTIVES OF MASTERING THE DISCIPLINE

**Target** mastering the discipline “pharmacology” consists in developing in students the ability to competently select the most effective and safe drugs based on their pharmacodynamic and pharmacokinetic characteristics, drug interactions, as well as in teaching students the methodology of mastering knowledge in pharmacology using scientific, reference literature, official statistical reviews, Internet resources and principles of evidence, the basics of prescription document flow and rules for writing prescriptions for drugs, storage and use of drugs.

### **Tasks** disciplines:

- to form in students an idea of the role and place of pharmacology among fundamental and medical sciences, about the directions of development of the discipline and its achievements;
- familiarize students with the history of the development of pharmacology, activities the most prominent figures in medicine and pharmacy, the contribution of domestic and foreign scientists to the development of world medical science;
- familiarize students with the main stages of the development of pharmacology as biomedical discipline, main stages of development, fundamental approaches to the creation of medicines;
- familiarize students with the modern stages of creating medicines drugs, the use of modern international standards in preclinical (GLP) and clinical (GCP) research and production (GMP) of drugs, general principles of clinical trials taking into account evidence, with the basic laws of pharmacokinetics and pharmacodynamics of drugs;
- teach students to analyze the effect of drugs based on the totality of their pharmacological effects, mechanisms and localization of action, pharmacokinetic parameters;
- to develop in students the ability to evaluate the possibilities of choice and the use of drugs 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;
- teach students to recognize possible side effects and toxicological

- manifestations when using medications and carry out their treatment;
- teach students the principles of preparing recipes and preparing prescriptions, the ability to write prescriptions for drugs in various dosage forms, as well as for certain pathological conditions, based on the characteristics of the pharmacodynamics and pharmacokinetics of drugs;
  - train students in organizing work with medications, basic skills in prescription document management, rules for storing medicines from the list of potent and poisonous drugs, as well as lists of narcotic drugs and psychotropic substances;
  - to develop in students the skills necessary to solve individual research and applied scientific tasks in the field of pharmacology, taking into account ethical, deontological aspects, basic information security requirements;
  - to develop in students the skills of a healthy lifestyle, work organization, safety regulations and monitoring compliance with environmental safety.

## II. REQUIREMENTS FOR THE RESULTS OF MASTERING THE DISCIPLINE

The process of studying the discipline is aimed at developing the following competencies in accordance with the Federal State Educational Standard of Higher Education and the EP of Higher Education in this specialty:

### **b) general professional (OPK):**

readiness for medical use of drugs and other substances and their combinations in solving professional problems (OPK-8);

ability to assess morphofunctional, physiological states and pathological processes in the human body to solve professional problems (OPK-9);

As a result of mastering the discipline, the student must:

### **Know:**

- classifications and groups of drugs;
- mechanism of action, pharmacodynamic effects, main pharmacokinetic parameters, side effects of drugs;

- indications and contraindications for prescribing drugs;
- interaction of drugs when prescribed in combination;

**Be able to:**

- navigate the nomenclature of drugs by topic and their belonging to groups, determine the main medications and means of choice for emergency measures;
- navigate the synonyms of drugs, and the possible replacement of one drug with another; correctly write prescriptions for drugs;
- use reference literature on medicines;

**Own:**

Taking into account the severity of the disease, the urgency of the condition and the manifestation of the underlying carry out the symptom complex:

- selection and prescription of a specific drug, taking into account its pharmacodynamics and pharmacokinetics;
- take into account the functional and pathological state of the patient when prescribing medications or a group of medications
- choice of dosage form, dose and route of administration of drugs, dosage regimen (frequency, dependence on food intake and other medications);
- predicting the risk of side effects of drugs; justification of the rationality and necessity of combined prescription of drugs, correction of the dosage regimen when prescribing drugs, taking into account their possible metabolic interaction. The basics of therapeutic measures to provide first aid for emergency and life-threatening conditions, including complications associated with the use of drugs and acute poisoning

### III. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF EP VO

3.1. The academic discipline "pharmacology" is basic (B1.B.18)

3.2 To study the discipline, knowledge, skills and abilities are required, formed by previous disciplines:

philosophy, bioethics, history of the fatherland, history of medicine, Laforeign language, language, psychology and pedagogy, physics, mathematics, medical

computer chemistry, biochemistry, biology, histology, embryology, cytology, normal physiology, microbiology and virology, immunology, pathological anatomy, pathophysiology

3.3. List of subsequent academic disciplines that require knowledge, skills and knowledge formed by this academic discipline:

Medical rehabilitation, Clinical pharmacology, Neurology, medical Genetics, venerology, neurosurgery, Psychiatry, psychology, Otorhinolaryngology, Ophthalmology, Forensic medicine, Life safety, Disaster medicine, Obstetrics and gynecology, Pediatrics, Propaedeutics of internal diseases, Faculty therapy, Occupational diseases, Hospital therapy, , Infectious diseases, Phthisiology, Outpatient therapy, General surgery, Anesthesiology, resuscitation, intensive care, Faculty surgery, Urology, Hospital surgery, Pediatric surgery, Dentistry, Oncology, radiation therapy, Traumatology, orthopedics

#### IV. CONTENT AND STRUCTURE OF DISCIPLINE

Labor intensity of the discipline in the third 8 hours 288

##### 4.1. Sections of the discipline studied in semesters 5 and 6

No. section	Section name	Number of hours					SRS
		Contact work					
		Total	L	WITH	ETC	LR	
Semester 5							
1	Introduction to pharmacology. General recipe. General pharmacology.	27	2		9		16
2	Chemotherapeutic agents.	36	8		12		16
3	Neurotropic agents.	37	6		15		16
4	Agents with a predominant effect on tissue metabolic processes.	32	4		12		16
4	Medicines that affect inflammation, allergies and immunity.	6	6				
5	Means influencing the functions of executive bodies.	6	6				
	<b>Total for the semester</b>	<b>144</b>	<b>32</b>		<b>48</b>		<b>64</b>
	<b>Test</b>						
Semester 6							

4	Medicines that affect inflammation, allergies and immunity.	23			9		14
5	Means influencing the functions of executive bodies.	47	8		24		15
6	Drugs affecting the central nervous system.	38	8		15		15
	<b>Total for the semester</b>	<b>108</b>	<b>16</b>		<b>48</b>		<b>44</b>
	Exam	<b>36</b>					
	<b>Total by discipline</b>	<b>288</b>	<b>48</b>		<b>96</b>		<b>108</b>

*SRO- independent work of students L-lectures*

*WITH- seminars (in disciplines in accordance with the standard and RUP)*

*LR -laboratory work (in disciplines in accordance with the curriculum) ETC- practical classes (in disciplines in accordance with the curriculum, in includes clinical practical training)*

#### 4.2. Contact work

##### Lectures

No. section	No. lectures	Lecture topics	Qty hours
<b>Semester 5</b>			
1	1	Subject, tasks and methods of modern pharmacology. Basic principles of general pharmacology.	2
2	2	<b>Basic principles of chemotherapy.</b> Classification of chemotherapeutic agents. Antibiotics of beta-lactam structure. macrolides, tetracyclines, chloramphenicol, aminoglycosides, polymexins and polyene antibiotics.	2
2	3	<b>Synthetic antimicrobial agents:</b> sulfonamides, nitrofurans, 8-hydroxyquinolines, quinoxidines, quinolone carboxylic acid derivatives.	2
2	4	Antiviral and antifungal agents.	2
2	5	Anti-blastoma drugs.	2
3	6	Medicines affecting efferent innervation. M- and N-cholinomimetics. M-cholinomimetics. Anticholinesterase substances. N-cholinomimetics.	2
3	7	M-anticholinergics. N-anticholinergics. M- and N-anticholinergic blockers (synthetic and central anticholinergic blockers).	2
3	8	Structure of the adrenergic synapse. Adrenergic receptors, their types and localization. Adrenergic agonists of direct and indirect action.	2

		Adrenergic blocking substances. Sympatholytics.	
4	9	Preparations of hormones of protein-polypeptide structure.	2
4	10	Antidiabetic drugs. Preparations of hormones with amino acid structure. Antithyroid drugs.	2
4	eleven	Anti-inflammatory drugs. Part 1	2
4	12	Anti-inflammatory drugs. Part 2	2
4	13	Drugs that affect the allergy process and immunity.	2
5	14	Antiarrhythmic drugs.	2
5	15	Antianginal, antiatherosclerotic drugs.	2
5	16	Antihypertensive drugs. Diuretics.	2
<b>Total for the semester:</b>			<b>32</b>
<b>Semester 6</b>			
5	17	Medicines that affect the functions of the gastrointestinal tract.	2
5	18	Medicines that affect the functions of the respiratory system.	2
5	19	Drugs affecting the blood coagulation system and hematopoiesis.	2
5	20	Drugs affecting the blood coagulation system and hematopoiesis.	2
6	21	Psychotropic drugs: neuroleptics, tranquilizers, sleeping pills, sedatives. Anticonvulsant, antiparkinsonian drugs.	2
6	22	Psychotropic drugs: antidepressants, mood stabilizers, psychostimulants, nootropics.	2
6	23	Anesthetics, ethanol.	2
6	24	Medicines for personalized therapy.	2
<b>Total for the semester:</b>			<b>16</b>
<b>Total by discipline hours</b>			<b>48</b>

### Practical lessons

No. section	No. seminar , ETC	Topic of practical work	Hours	Forms current control
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Semester 5				
1	1	General recipe.	3	HF, PT, KR
1	2	General pharmacology.	3	HF, PT, KR
1	3	<b><i>Final lesson on general formulation and general pharmacology.</i></b>	3	HF, PT, KR
2	4	Antiseptics and disinfectants. Basic principles of chemotherapy. Beta-lactam antibiotics. Macrolides. tetracyclines, chloramphenicol, polymyxins, aminoglycosides, polypeptides.	3	HF, PT, KR
2	5	Synthetic chemotherapeutic agents. Antiviral and antifungal agents.	3	HF, PT, KR
2	6	Antispirochetal, antituberculosis. Anti-blastoma drugs.	3	HF, PT, KR
2	7	<b><i>Final lesson on chemotherapy.</i></b>	3	HF, PT, KR
3	8	Neurotropic drugs. M- and N-cholinomimetics. M-cholinomimetics. Anticholinesterase substances. N-Cholinomimetics.	3	HF, PT, KR
3	9	M-anticholinergics. N-cholinergic blockers (ganglionic blockers and muscle relaxants). M- and N-cholinergic blockers (synthetic and central anticholinergic blockers).	3	HF, PT, KR
3	10	Structure of the adrenergic synapse. Adrenergic receptors, their types and localization. Transmission of excitation at the synapse. Adrenergic agonists of direct and indirect action.	3	HF, PT, KR
3	eleven	Adrenergic blocking substances. Sympatholytics.	3	HF, PT, KR
3	12	<b><i>Final lesson on drugs affecting afferent innervation and neurotropic drugs.</i></b>	3	HF, PT, KR
4	13	Preparations of hormones of protein-polypeptide structure.	3	HF, PT, KR
4	14	Antidiabetic drugs. Preparations of hormones with amino acid structure. Antithyroid drugs.	3	HF, PT, KR



4	15	Hormone preparations with steroid structure. Anabolic steroid. Sex hormones and contraceptives.	3	HF, PT, KR
4	16	<b><i>Final lesson on Drugs that affect tissue metabolic processes.</i></b>	3	HF, PT, KR
<b><i>Total for the semester</i></b>			<b>48</b>	
<b>Semester 6</b>				
4	17	Anti-inflammatory drugs.	3	HF, PT, KR
4	18	Painkillers. Antiallergic drugs.	3	HF, PT, KR
4	19	<b><i>Final lesson on drugs that influence the processes of inflammation and allergies.</i></b>	3	HF, PT, KR
5	20	Antianginal agents. Antiatherosclerotic agents.	3	HF, PT, KR
5	21	Antihypertensive and hypertensive drugs. Diuretics.	3	HF, PT, KR
5	22	Antiarrhythmic drugs. Cardiac glycosides.	3	HF, PT, KR
5	23	<b><i>Final lesson on means affecting the functions of the cardiovascular system.</i></b>	3	HF, PT, KR
5	24	Medicines that affect the functions of the gastrointestinal tract. Medicines affecting the myometrium.	3	HF, PT, KR
5	25	Medicines that affect the functions of the respiratory system. Analeptics.	3	HF, PT, KR
5	26	Drugs affecting the blood coagulation system and hematopoiesis.	3	HF, PT, KR
5	27	<b><i>Final lesson on means influencing the functions of executive bodies.</i></b>	3	HF, PT, KR
6	28	Psychotropic drugs: neuroleptics, tranquilizers, sleeping pills, sedatives. Anticonvulsant, antiparkinsonian drugs.	3	HF, PT, KR
6	29	Psychotropic drugs: antidepressants, mood stabilizers, psychostimulants, nootropics.	3	HF, PT, KR

6	thirty	Anesthetics, ethanol.	3	HF, PT, KR
6	31	<b><i>Final lesson on drugs acting on the central nervous system.</i></b>	3	HF, PT, KR
6	32	<b><i>Exam recipe, testing.</i></b>	3	HF, PT, KR
<i>Total for the semester</i>				<b>48</b>
<b>Total hours discipline:</b>				<b>96</b>

### 4.3. Independent work of students

No. section	Type of independent work of students	Qty hours	Shapes of the current control
<b>Semester 5</b>			
1	Preparation for the current lesson. Preparation for the final lesson "Introduction to pharmacology. General recipe. General pharmacology".	16	HF, PT, KR
2	Preparation for the current lesson. Preparing for the final lesson "Chemotherapeutic facilities".	16	HF, PT, KR
3	Preparation for the current lesson. Preparation for the final lesson "Neurotropic drugs".	16	HF, PT, KR
4	Preparation for the current lesson. Preparation for the final lesson "Medicines with a predominant effect on tissue metabolic processes."	16	HF, PT, KR
<b>Total for semester 64</b>			
<b>Semester 6</b>			
4	Preparation for the current lesson. Preparation for the final lesson on medications that affect inflammation, allergies and immunity.	14	HF, PT, KR
5	Preparation for the current lesson. Preparation for the final lesson "Means influencing the functions of executive bodies."	15	HF, PT, KR
6	Preparation for the current lesson. Preparation for the final lesson "Drugs affecting the central nervous system."	15	HF, PT, KR
<b>Total for semester 44</b>			
<b>Total by discipline hours 108</b>			

*Legend:*

- *PT - written test; SZ -*
- *situational tasks;*
- *KV - Test questions;*

- *KR – Control recipe*
- *R – abstract.*

## V. ASSESSMENT FUND FOR CURRENT CONTROL, INTERMEDIATE CERTIFICATION

The fund of assessment tools for determining the level of acceleration of competencies as a result of mastering the discipline is an appendix to the work program.

## VI. EDUCATIONAL AND METHODOLOGICAL SUPPORT OF DISCIPLINE

### Internet resources

	<b>ELECTRONIC EDUCATIONAL RESOURCES</b>	<b>Access to the resource</b>
1.	<b>Electronic educational library</b> RostSMU [Electronic resource]. - Access mode: <a href="http://80.80.101.225/opacc">http://80.80.101.225/opacc</a>	Access is not limited
2.	<b>Student Advisor</b> [Electronic resource]: EBS. – M.: LLC "IPUZ". - Access mode: <a href="http://www.studmedlib.ru">http://www.studmedlib.ru</a>	Access is not limited
3.	<b>Consultant doctor</b> Electronic medical library [Electronic resource]: EBS. – M.: LLC GC "GEOTAR". - Access mode: <a href="http://www.rosmedlib.ru">http://www.rosmedlib.ru</a>	Access is not limited
4.	<b>Single window of access to information resources</b> [Electronic resource]. - Access mode: <a href="http://window.edu.ru/">http://window.edu.ru/</a> [12.02.2018].	Open access
5.	<b>Russian education. Federal educational portal</b> [Electronic resource]. - Access mode: <a href="http://www.edu.ru/index.php">http://www.edu.ru/index.php</a> [02/22/2018].	Open access
6.	<b>ACADEMICIAN. Online dictionaries</b> [Electronic resource]. - Mode access: <a href="http://dic.academic.ru/">http://dic.academic.ru/</a> [02/22/2018].	Open access
7.	<b>WordReference.com</b> [Electronic resource]: online language dictionaries. - Access mode: <a href="http://www.wordreference.com/enru/">http://www.wordreference.com/enru/</a> [02/22/2018].	Open access
8.	<b>History.RF</b> [Electronic resource]. - Access mode: <a href="https://histrf.ru/">https://histrf.ru/</a> [02/22/2018].	Open Access
9.	Legal reference system" <b>Consultant Plus</b> "[Electronic resource]. - Access mode: <a href="http://www.consultant.ru">http://www.consultant.ru</a>	Access limited
10.	<b>Legal Russia</b> [Electronic resource]: federal legal portal. - Access mode: <a href="http://www.law.edu.ru/">http://www.law.edu.ru/</a> [02/22/2018].	Open access
eleven.	<b>Official Internet portal legal information</b> [Electronic resource]. - Access mode: <a href="http://pravo.gov.ru/">http://pravo.gov.ru/</a> [02/22/2018].	Open access
12.	<b>Federal Electronic Medical Library of the Russian Ministry of Health</b> [Electronic resource]. - Access mode: <a href="http://www.femb.ru/feml/">http://www.femb.ru/feml/</a> , <a href="http://feml.scsmll.rssi.ru">http://feml.scsmll.rssi.ru</a> [02/22/2018].	Open access
	<b>Electronic library subscription of the Central Scientific</b>	

13.	<b>medical library (EBA CNMB)</b> [Electronic resource] / OOOMIP "Med. information resources"; 1MGMU named after. THEM. Sechenov. - Access mode: <a href="http://www.emll.ru/newlib/">http://www.emll.ru/newlib/</a>	Access limited
14.	<b>Scientific electronic library eLIBRARY</b> [Electronic resource]. - Access mode: <a href="http://elibrary.ru">http://elibrary.ru</a>	Open access
15.	<b>National Electronic Library</b> [Electronic resource]. - Access mode: <a href="http://neb.rf/">http://neb.rf/</a>	Access is not limited
16.	<b>Scopus</b> [Electronic resource] / Elsevier Inc., Reed Elsevier. – Electronic data. – Philadelphia: Elsevier BV, PA, 2015. – Access mode: <a href="http://www.scopus.com/">http://www.scopus.com/</a>	Access limited
17.	<b>Web of Science</b> [Electronic resource]. Mode access: <a href="http://apps.webofknowledge.com">http://apps.webofknowledge.com</a> (National subscription of the Russian Federation)	Access is not limited
18.	<b>MEDLINE Complete EBSCO</b> [Electronic resource]. - Access mode: <a href="http://search.ebscohost.com">http://search.ebscohost.com</a> (National subscription of the Russian Federation)	Access is not limited
19.	<b>Medline</b> (PubMed, USA) [Electronic resource]. - Access mode: <a href="https://www.ncbi.nlm.nih.gov/pubmed/">https://www.ncbi.nlm.nih.gov/pubmed/</a> [02/22/2018].	Open access
20.	<b>Free Medical Journals</b> [Electronic resource]. - Access mode: <a href="http://freemedicaljournals.com">http://freemedicaljournals.com</a> [02/22/2018].	Open access
21.	<b>Free Medical Books</b> [Electronic resource]. - Access mode: <a href="http://www.freebooks4doctors.com/">http://www.freebooks4doctors.com/</a> [02/22/2018].	Open access
22.	<b>Internet Scientific Publication</b> [Electronic resource]. - Access mode: <a href="http://www.ispub.com">http://www.ispub.com</a> [02/22/2018].	Open access
23.	<b>CyberLeninka</b> [Electronic resource]: scientific. electron. beep. - Mode access: <a href="http://cyberleninka.ru/">http://cyberleninka.ru/</a> [02/22/2018].	Open access
24.	<b>Archive of scientific journals</b> [Electronic resource] / NEIKON. - Mode access: <a href="http://archive.neicon.ru/xmlui/">http://archive.neicon.ru/xmlui/</a> [02/22/2018].	Open access
25.	<b>Open access journals in Russian</b> [Electronic resource]/ElPub NEICON platform. - Access mode: <a href="http://elpub.ru/elpub-journals">http://elpub.ru/elpub-journals</a> [02/22/2018].	Open access
26.	<b>Medical Bulletin of the South of Russia</b> [Electronic resource]. - Mode access: <a href="http://www.medicalherald.ru/jour">http://www.medicalherald.ru/jour</a> [02/22/2018].	Open access
27.	<b>World Health Organization</b> [Electronic resource]. - Access mode: <a href="http://who.int/ru/">http://who.int/ru/</a> [12.02.2018].	Open access
28.	<b>Med-Edu.ru</b> [Electronic resource]: medical video portal. - Mode access: <a href="http://www.med-edu.ru/">http://www.med-edu.ru/</a> [02/22/2018].	Open access
29.	<b>DoctorSPB.ru</b> [Electronic resource]: information reference. portal about medicine. - Access mode: <a href="http://doctorspb.ru/">http://doctorspb.ru/</a> [02/22/2018].	Open access
thirty.	<b>Evrika.ru.</b> [Electronic resource]: Information and educational portal for doctors. - Access mode: <a href="https://www.evrika.ru/">https://www.evrika.ru/</a> [02/22/2018].	Required registration
31.	<b>Univadis.ru</b> [Electronic resource]: international. honey. portal. - Mode access: <a href="http://www.univadis.ru/">http://www.univadis.ru/</a> [02/22/2018].	Required registration
32.	<b>BEARWEST. Russian doctor portal:</b> library, knowledge base [Electronic resource]. - Access mode <a href="https://medvestnik.ru/">https://medvestnik.ru/</a> [02/22/2018]	Required registration

33.	<b>Modern problems of science and education</b> [Electronic magazine]. - Access mode: <a href="http://www.science-education.ru/ru/issue/index">http://www.science-education.ru/ru/issue/index</a> [02/22/2018].	Open access
	<b>Other</b> Open resources can be found at: <a href="http://rostgmu.ru">http://rostgmu.ru</a> → Library→ Electronic catalog→ Open resources Internet→ further by keyword...	Open access

#### List of software

1. Office Standard, license No. 66869707 (agreement No. 70-A/2016.87278 dated May 24, 2016).
2. System Center Configuration Manager Client ML, System Center Standard, license No. 66085892 (agreement No. 307-A/2015.463532 dated 12/07/2015);
3. Windows, license No. 66869717 (agreement No. 70-A/2016.87278 dated May 24, 2016).
4. Office Standard, license No. 65121548 (agreement No. 96-A/2015.148452 dated 05/08/2016);
5. Windows Server - Device CAL, Windows Server – Standard, license No. 65553756 (agreement No. RGMU1292 dated 08/24/2015); 6. Windows, license No. 65553761 (agreement No. RGMU1292 dated August 24, 2015); 7. Windows Server Datacenter - 2 Proc, license No. 65952221 (agreement No. 13466/RND1743/RGMU1679 dated October 28, 2015);
8. Kaspersky Total Security 500-999 Node 1 year Educational Renewal License (Agreement No. 358-A/2017.460243 dated November 1, 2017).
9. Provision of communication services (Internet): Rostelecom - agreement No. RGMU7628 dated 12/22/2017; "ER-Telecom Holding" - agreement RGMU7611 dated December 22, 2017; "MTS" - agreement RGMU7612 dated December 22, 2017.