

Federal State Budget
Educational Institution of Higher Education
"Dagestan State Medical University"
Health Ministry of the Russian Federation



AFFIRMED by

Vice Rector for Academic Affairs, Ph.D

D.A. Omarova

« 31 », «August» 2020.

WORKING PROGRAMM
on «Pharmacology»

Discipline index – **Б1.Б.21**
Specialty – **05.31.01 Medical Care**
Level of higher education: **specialty**
Graduate qualifications: **medical doctor**
Faculty: **General medicine**
Department: Pharmacology
Form of education: Full-time
Course - III
Semester –V-VI
Total labor intensity - 7 credit units, 252 hours
Lectures - 32 hours
Practical classes - 111 hours
Student's self-study-73 hours
Control - 36 hours
Control form - exam in the VI semester

Makhachkala 2020

The work program of the discipline "Pharmacology" is designed in accordance with the work curriculum of the Higher Higher Education Program for Higher Education in the specialty 31.05.01 General Medicine (higher education - specialty), approved by order No. 95 of the Ministry of Education and Science of the Russian Federation of 09/02/2016.

The work program was approved at a meeting of the Department of Pharmacology on August 28, 2020, protocol No. 14

Work program was agreed by:

1. Director NL DSMU _____ (V.R. Musaeva)
2. Head of UMR S and KCO _____ (A.M. Karimova)
3. Dean of the General Medicine Faculty _____ (R.M. Ragimov)

Head of the department, candidate of medical sciences,

Associate professor

Z. Sh. Magomedova

Compiled by:

Magomedova Z. Sh. - Candidate of Medical Sciences, Associate Professor,

Head of the department.

Reviewer

Abakarov M.G. – PhD, Associate Professor, Head of Clinical Pharmacology

Department _____

Saidov M.Z. – PhD, Professor, Head of the Pathological Physiology

Department _____

1. The goals and objectives of the discipline:

The purpose of mastering the discipline is to provide students with the necessary knowledge and skills in the field of pharmacology, taking into account subsequent training and medical professional activities.

The tasks of mastering the discipline are:

- mastery of basic information on general pharmacology, mechanism of action, pharmacokinetics, pharmacodynamics and knowledge necessary when using the main groups of drugs;
- Obtaining ideas about drug toxicology and the principles of first aid for acute drug poisoning;
- the ability to choose a rational complex of drugs for treating patients, choose groups of drugs, specific drugs of this group, taking into account their pharmacodynamics and pharmacokinetics, take into account possible side effects, increase the immune activity of the body, determine the necessary drug treatment for emergency care for general diseases;
- the ability to write prescriptions for various dosage forms;
- the ability to choose the optimal dose and route of administration of the drug for specific diseases

2. List of planned learning results.

Competencies formed in the process of studying a discipline:

| № | Name of competency category | |
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| | 1 | 2 |
| 1 | General cultural competencies | GC-1: the ability to abstract thinking, analysis, synthesis. |
| | | To know: general laws of pharmacokinetics and pharmacodynamics of medicinal (chemical) substances |
| | | To be able to: to analyze the pharmacokinetics and pharmacodynamics of drugs, taking into account the anatomical and physiological characteristics |
| | | To possess: the skills of using pharmacokinetics indicators and the dependence of pharmacodynamics parameters on the properties of drugs, dosing regimen, conditions for their use, characteristics and condition of the body for rational pharmacotherapy |
| 2 | General professional competencies | GPC-8: readiness for medical use of drugs and other substances and their combinations in solving professional problems |
| | | To know: classification and main characteristics of drugs, pharmacodynamics and pharmacokinetics, indications and contraindications for the use of drugs, side effects |
| | | To be able to: analyze the effect of drugs on the totality of their pharmacological properties and the possibility of their use for therapeutic treatment; |
| | | To possess: skills in the use of drugs in the treatment, rehabilitation and prevention of various diseases and pathological conditions; |
| | | PC-14: willingness to determine the need for the use of natural healing factors, drug, non-drug therapy and other methods in patients in need of medical rehabilitation and spa treatment |
| | Professional competencies | To know: features of pharmacokinetics and pharmacodynamics, taking into account age-related characteristics, advantages and disadvantages of various dosage forms |
| | | To be able to: use various dosage forms in the treatment of certain pathological conditions, based on the characteristics of their pharmacokinetics and pharmacodynamics |

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| | ncies | To possess: the skills of choosing and prescribing medicines (preparations) for therapeutic measures in case of common diseases and pathological processes |
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3. The place of the discipline (module) in the structure of the educational program

The discipline "Pharmacology" refers to the basic part of the B1.B study cycle, studied in the 5th, 6th semesters. To study this discipline, the following knowledge and skills formed by the previous disciplines "Chemistry", "Biology", "Biochemistry", "Histology, embryology, cytology", "Normal physiology".

The discipline "Pharmacology" is the preceding one for the study of the disciplines: "Clinical Pharmacology", "Faculty Therapy, Occupational Diseases", "Hospital Therapy", "Endocrinology", "Phthisiology", "Medical Prevention", "Fundamentals of Evidence-Based Medicine".

4. The complexity of the discipline (module) and types of contact work.

| Type of study | Total hours | Semesters | |
|--|-------------|------------|------------|
| | | V | VI |
| Contact work (total), including | | | |
| Classroom work | 143 | 73 | 70 |
| Including: | | | |
| Lectures (L) | 32 | 16 | 16 |
| Practical Activities (PA) | 111 | 57 | 54 |
| Seminars (S) | | | |
| Laboratory work (LR) | | | |
| Extracurricular work | | | |
| Student's self-study (SSS) | 73 | 35 | 38 |
| Including: | | | |
| Report | | 4 | 4 |
| Preparing to the practical work | | 21 | 22 |
| Prercriptions | | 10 | 12 |
| Total labor | 252 | 108 | 144 |
| hours | | | |
| credit unit | 7 | 3 | 4 |

5. The structure and content of the discipline (module)

5.1. Sections of the discipline (module) and competencies that should be mastered in their study

| № | competency index | Name of the discipline section | Section Content |
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| 1 | GC-1 GPC- 8 | Introduction. General recipe | The recipe, its structure. General rules for making recipes. Prescription Forms. Liquid, soft, solid dosage forms. Dosage forms for injection. The rules for writing them out in recipes. |

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| 2 | GC-1 GPC-8 | General Pharmacology | <p>The definition of pharmacology, its place among other medical and biological sciences. The main stages of the development of pharmacology.</p> <p>The development of pharmacology in Russia.</p> <p>The principles of finding new drugs. The synthesis of new biologically active substances based on the study of the relationship between the chemical structure and action. Obtaining preparations from plant and animal raw materials. The importance of biotechnology in the creation of medicines. Basic principles and methods of testing new drugs.</p> <p>Pharmacokinetics of drugs.</p> <p>Enteral and parenteral routes of administration of drugs. Absorption of drugs with different routes of administration. The main mechanisms of absorption. Factors that alter the absorption of substances. The concept of the bioavailability of drugs.</p> <p>Distribution of drugs in the body, deposition. The transformation of drugs in the body. The value of microsomal liver enzymes. Ways of excretion of drugs. The concept of clearance, the half-elimination period of substances. Pharmacodynamics of drugs. The main biological substrates ("targets") with which medicinal substances interact. The concept of specific receptors, agonists and antagonists. Pharmacological effects (main, side, toxic).</p> <p>Types of drug action.</p> <p>Factors that change the pharmacokinetics and pharmacodynamics of drugs. Chemical structure and physicochemical properties of substances. The value of stereoisomerism, lipophilicity, polarity, degree of dissociation.</p> <p>The dependence of the effect on the dose (concentration) of the substance.</p> <p>Types of doses: medium and higher therapeutic, single, daily and course; toxic. The breadth of therapeutic action.</p> <p>The dependence of the effect of substances on gender and age, the state of the body. The role of genetic factors. The concept of chronopharmacology.</p> <p>Change in the action of substances during their repeated injections. Addiction, material and functional cumulation. Drug</p> |
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| | | | <p>addiction.</p> <p>The combined use of drugs. The interaction of drugs. Synergism, antagonism. Antidotism.</p> <p>Side and toxic effects of drugs. Side effects of an allergic and non-allergic nature. The toxic effect of drugs. Teratogenicity, embryotoxicity. The importance of genetic factors in the development of adverse effects.</p> <p>Idiosyncrasy.</p> |
| 3 | GC-1 GPC-8 PC-14 | Drugs Affecting to peripheral nervous department thesystem | <p>Drugs, влияющие на афферентную иннервацию.</p> <p>Drugs for local anesthesia (local anesthetics).</p> <p>Classification. Mechanism of action. Comparative characteristics of drugs and their use for different types of anesthesia. Toxic effect of local anesthetics and measures to prevent it.</p> <p>Astringent, Coating, and Adsorbent Drugs. Principles of action. Indications for use.</p> <p>Irritating Drugs. Effect on the skin and mucous membranes. The value of reflexes arising from this. Distracting effect. Application.</p> <p>Drugs affecting efferent innervation:</p> <p>I. Drugs acting on cholinergic synapses.</p> <p>Muscarinic and nicotine-sensitive receptors (m- and n-cholinergic receptors). Subtypes of m- and n-cholinergic receptors. Classification of agents affecting the transmission of excitation in cholinergic synapses.</p> <p>M-Cholinomimetic Drugs. Effects arising from the excitation of different subtypes of m-cholinergic receptors. The effect of m-cholinomimetics on the eye (pupil size, intraocular pressure, accommodation), smooth muscles of internal organs, secretion of glands, heart and tone of blood vessels. Application. Treatment of poisoning with m-cholinomimetics.</p> <p>H-Cholinomimetic Drugs. The effects associated with the influence on the n-cholinergic receptors of the synocarotid zone, chromaffin cells of the adrenal medulla. Application.</p> <p>Toxic effect of nicotine. The use of n-</p> |

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| | | | <p>cholinomimetic agents to facilitate smoking cessation.</p> <p>M, H-Cholinomimetic Drugs. The main effects of anethylcholine and carbacholine (muscarinic and nicotine-like effects). Indications for use. Side effects.</p> <p>Anticholinesterase Drugs.</p> <p>The nature of the interaction with acetylcholinesterase. The main effects. Comparative characteristics of drugs. Indications for use. Side and toxic effects of anticholinesterase drugs. The treatment of poisoning. The use of cholinesterase reagents for poisoning with organophosphorus compounds.</p> <p>M-anticholinergic Drugs. Effect on the eye, cardiovascular system, smooth muscles, exocrine glands. Action on the central nervous system. Application. Atropine poisoning and help with poisoning. Features of the action and use of scopolamine, ipratropium, pirenzepine.</p> <p>H-anticholinergic Drugs. Ganglion Blocking Drugs. The main effects, the mechanism of their occurrence. Indications for use. Side effect.</p> <p>Drugs that block neuromuscular transmission.</p> <p>Classification. The mechanisms of action of depolarizing and antidepolarizing agents. Application. Side effects. Antagonists of anti depolarizing agents.II.</p> <p>Drugs acting on adrenergic synapses.</p> <p>Types and subtypes of adrenergic receptors. The functional role of synaptic and extrasynapticadrenoreceptors of various subtypes. Classification of drugs acting on adrenergic synapses.</p> <p>Adrenomimetic Drugs. Classification of direct-acting adrenergic agonists according to their interaction with different types of adrenergic receptors. Substances that stimulate α- and β-adrenergic receptors. The main properties of adrenaline (effect on the cardiovascular system, smooth muscles, metabolism). Application. Features of the action of norepinephrine. Effect on the heart, vascular tone. Application.</p> <p>α-adrenergic agonists. The main effects and application of mesatone. The action and use of galazolin.</p> <p>β-adrenergic agonists.</p> |
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| | | | <p>Pharmacodynamics of isadrin.</p> <p>Application. β1-adrenomy-metics: effects, application. β2-adrenergic agonists: effects, application.</p> <p>Indirect adrenomimetics (sympathomimetics). The mechanism of action of ephedrine. The main effects. Application. Side effects of various groups of adrenergic agonists.</p> <p>Adrenergic Blocking Drugs. Pharmacodynamics of α-blockers. Application. Side effects. The main properties and use of β-blockers. Side effects. β1-blockers. Drugs for the treatment of glaucoma. α, β-blockers. Properties, application.</p> <p>Sympatolytic Drugs. The mechanism of action and main effects. Application. Sideeffect.</p> |
| 4 | GC-1 GPC-8 PC-14 | Drugs Affecting to the central nervous system. | <p>The concept of mediator and modulator systems</p> <p>brain and spinal cord as "targets" for drugs. Possible mechanisms for changing synaptic transmission.</p> <p>Substances of general and selective action.</p> <p>Drugs for general anesthesia (Drugs for general anesthesia, anesthetics).</p> <p>The history of the discovery and use of agents for general anesthesia. Stages of anesthesia, their general characteristics.</p> <p>The mechanisms of action of agents for general anesthesia. The concept of the breadth of narcotic action.</p> <p>Comparative characteristics of drugs for inhalation anesthesia (activity, rate of development of anesthesia, analgesic and muscle-relaxing properties, aftereffect, effect on the cardiovascular system, flammability).</p> <p>Features of the action of funds for non-inhalation anesthesia; their comparative assessment (the rate of development of anesthesia, analgesic and muscle-relaxing properties, duration of action, aftereffect).</p> <p>Side effects of general anesthesia.</p> <p>Ethanol. Resorptive action of ethyl alcohol: effect on the central nervous system.</p> <p>Antimicrobial properties. Local effects on the skin and mucous membranes. Application. Toxicological characteristics. Effect on the cardiovascular system, gastrointestinal tract, liver, endocrine system.</p> |

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| | | | <p>Acute poisoning and its treatment. Alcoholism, its social aspects. Principles of pharmacotherapy of alcoholism.</p> <p>Hypnotic Drugs. Classification. The effect of sleeping pills on sleep patterns. Mechanisms of beneficial action. Derivatives of benzodiazepine are agonists of benzodiazepine receptors having pronounced sleeping pills.</p> <p>"Non-benzodiazepine" agonists of benzodiazepine receptors. Hypnotic properties of central histamine H1 receptor blockers.</p> <p>Derivatives of barbituric acid; their application.</p> <p>Side effect of sleeping pills. The possibility of drug dependence. Acute poisoning, the principles of its pharmacotherapy. Antagonists of sleeping pills benzodiazepine</p> <p>Antiepileptic Drugs. The mechanisms of action of antiepileptic drugs. Comparative evaluation of the effectiveness of individual drugs in different forms of epilepsy. Drugs for the relief of epileptic status. Side effects of antiepileptic drugs.</p> <p>Antiparkinsonian Drugs. The basic principles of pharmacotherapy of Parkinson's disease and Parkinson's syndrome. The mechanisms of action of antiparkinsonian drugs that stimulate dopaminergic processes. MAO-B inhibitors; substances that inhibit COMT. Comparative evaluation of the effectiveness of individual drugs. The main side effects.</p> <p>The use of DOPA decarboxylase inhibitors, peripheral dopamine receptor blockers, "atypical" antipsychotics to reduce the side effects of levodopa.</p> <p>Painkillers (Analgesics). An idea of the systems of perception and regulation of pain in the body; opioid receptors and their endogenous ligands. Classification of painkillers. Opioid analgesics, analgesic mechanisms. Interaction with different subtypes of opioid receptors. Effects due to effects on the central nervous system. Effect on the function of internal organs.</p> <p>Comparative characteristics of agonists and partial agonists, opioid receptor antagonist agonists.</p> <p>Indications for use. The concept of</p> |
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| | | | <p>antipsychotics. Side effects. Addictive. Drug addiction. Acute poisoning with opioid analgesics, the principles of its pharmacotherapy. Antagonists of opioid analgesics. Operating principle. Application. Non-opioid analgesics are predominantly of central action. Cyclooxygenase inhibitors. Sodium channel blockers, monoamine reuptake inhibitors, α2-adrenergic agonists, NMDA receptor antagonists, GABA-B mimetics. Differences from opioid analgesics. Application. Psychotropic Drugs. Antipsychotic Drugs (Antipsychotics). Classification. Antipsychotic activity. Effect on dopaminergic processes in the brain. Change in other neurotransmitter processes in the central nervous system and peripheral tissues. Potentiation of the action of agents for general anesthesia and analgesics. Antiemetic effect. Comparative characteristics of antipsychotic drugs. “Atypical” Antipsychotic Drugs. The use of antipsychotics in medical practice. Side effects. Antidepressants. Classification. Inhibitors of neuronal uptake of monoamines are substances of indiscriminate and selective action. Effect on α-adrenoceptors, m-cholinergic receptors and histamine receptors; effects arising from this. Substances selectively inhibitory MAO-A. Comparative evaluation of drugs. The main side effects. Drugs for treating mania. Application. Main side effects. Anxiolytics (tranquilizers). Derivatives of benzodiazepine - agonists of benzodiazepine receptors Anxiolytic effect. Sedative, hypnotic anticonvulsant, muscle-relaxing amnesic effect. Anxiolytics with a weak sedative and hypnotic effect. Mechanism of action. Substances of different chemical structure. The use of anxiolytics. Side effects. The possibility of drug dependence. Sedative Drugs. Effect on the central nervous system. Application. Side effects. Psychostimulating Drugs. Mechanisms</p> |
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| | | | <p>of psychostimulating action. Comparative characteristics of psychostimulating agents. Effect on the cardiovascular system. Indications for use. Side effects. The possibility of drug dependence.</p> <p>Nootropic Drugs. Effect on higher nervous activity. Indications for use.</p> <p>Analeptics. Mechanisms of a stimulating effect on the central nervous system. Effect on respiration and blood circulation. Application. Side effects.</p> |
| 5 | GC-1 GPC-8 PC-14 | Drugs Affecting the function of the executive organs. | <p>Drugs affecting the cardiovascular system. Cardiotonic Drugs. Cardiac glycosides. Pharmacodynamics of cardiac glycosides: effect on the strength and rhythm of heart contractions, conduction, automatism, metabolism in the myocardium. The mechanism of cardiotonic action of cardiac glycosides. Comparative characteristics of drugs (activity, absorption from the gastrointestinal tract, development speed and duration of action, cumulation). Application. Side effects. Treatment and prevention of intoxication with cardiac glycosides.</p> <p>Cardiotonic Drugs of Non-Glycoside Structure. The mechanism of cardiotonic action, application.</p> <p>Antiarrhythmic Drugs. Classification. Principles of action. Drugs used for tachyarrhythmias and extrasystoles. Drugs used for blockade of the conduction system of the heart.</p> <p>Drugs used for coronary heart disease. The basic principles for eliminating oxygen deficiency in angina pectoris (reducing the need for oxygen in the heart, increasing oxygen delivery to the heart). Drugs used to stop and prevent angina attacks (antianginal drugs). The mechanism of action of nitroglycerin. Long-acting nitroglycerin preparations.</p> <p>Antianginal properties of β-blockers, calcium channel blockers. The basic principles of drug treatment of myocardial infarction.</p> <p>Antihypertensive Drugs (Antihypertensive Drugs).</p> <p>Classification. Localization and mechanisms</p> <p>actions of neurotropic drugs. Drugs that</p> |

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| | | | <p>affect the renin-angiotensin system. Myotropic Drugs (calcium channel blockers, potassium channel activators, nitric oxide donors, etc.). Antihypertensive effect of diuretics. Side effects of antihypertensive drugs, their prevention and elimination.</p> <p>Hypertensive Drugs (adrenaline, angiotensinamide). Localization and mechanism of action of adrenomimetic drugs, angiotensinamide. Application. Features of the action of dopamine.</p> <p>Diuretic Drugs. Classification. The mechanisms of action of diuretics that inhibit the function of the epithelium of the renal tubules. Their comparative assessment (effectiveness, rate of development and duration of the effect, effect on the ion balance). Potassium and magnesium preserving diuretics. Aldosterone antagonists, effect on ion balance. The principle of action of osmotic diuretics. The use of diuretics. The principles of drug combination. Side effects.</p> <p>Drugs that affect respiratory function. Respiratory stimulants. Mechanisms of the stimulating effect of substances on respiration. Comparative characteristics of respiratory stimulants from the groups of analeptics and n-cholinomimetics. Routes of administration. Differences in duration of action. Application.</p> <p>Antitussive Drugs. Substances of central and peripheral action. Application. Side effects. The possibility of drug dependence and addiction.</p> <p>Expectorant Drugs. Expectorant Drugs Reflex and Direct Action. Mucolytic Drugs. Routes of administration. Indications for use. Side effects.</p> <p>Drugs used for bronchospasm.</p> <p>Bronchodilator Drugs. Differences in the mechanism of action of drugs from the groups of adrenergic agonists, m-anticholinergic antispasmodics and myotropic antispasmodics. Preparations of β2-adrenergic agonists and derivatives of methylxanthine prolonged action. Indications for the use of bronchodilators, their administration, side effects. The use of anti-allergic and anti-inflammatory drugs in bronchial asthma.</p> |
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| | | | <p>Drugs used for pulmonary edema. The principles of action of drugs used to treat pulmonary edema. The choice of drugs depending on the mechanisms of its development. The use of morphine, diuretics. The appointment of vasodilating substances predominantly venotropic action. The use of cardiotoxic agents for pulmonary edema associated with heart failure. Anti-foaming effect of ethyl alcohol. The use of antihypertensive drugs. Oxygen therapy.</p> <p>Drugs that affect digestive function. Drugs that affect appetite. Drugs that increase appetite. The mechanism of the stimulating effect of bitterness on appetite and gastric secretion. Indications for use.</p> <p>Drugs that lower appetite (anorexigenic Drugs). Mechanisms of action. Use in the treatment of obesity.</p> <p>Drugs that affect the function of the salivary glands. Mechanisms of action. Application. Side effects.</p> <p>Drugs used in violation of the function of the glands of the stomach. Drugs replacement therapy (natural gastric juice, pepsin, dilute hydrochloric acid). Substitution therapy with a decrease in the secretory activity of the stomach.</p> <p>Drugs that lower the secretion of the glands of the stomach. The principles of action of substances that reduce the secretory function of the gastric glands (H⁺, K⁺ - ATPase blockers, histamine H₂-receptor blockers, m-anticholinergics).</p> <p>Antacid Drugs. Comparative characteristics of drugs. Indications for use. Side effects. Gastroprotectors. Principles of action. Use for peptic ulcer.</p> <p>Emetic and Antiemetic Drugs. The mechanism of action of emetics. Their application. Principles of action of antiemetics. Indications for the use of individual drugs.</p> <p>Drugs that affect liver function.Cholagogue. Drugs. Classification. The principle of action of agents that enhance the formation of bile. Use of preparations containing bile and herbal remedies. Drugs that promote bile secretion. Hepatoprotectors. The principle of</p> |
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| | | | <p>action, indications for use.</p> <p>Drugs used for impaired pancreatic excretory function (pancreatin). Drugs replacement therapy for inadequate pancreatic function.</p> <p>Drugs that affect gastrointestinal motility. Drugs that inhibit gastrointestinal motility.</p> <p>Differences in the mechanism and localization of the action of drugs that inhibit the motility of the gastrointestinal tract. Application. Side effects.</p> <p>Drugs that enhance gastrointestinal motility.</p> <p>The difference in the mechanism and localization of the action of substances that enhance the motility of the gastrointestinal tract (cholinomimetic Drugs, anticholinesterase Drugs, prokinetic Drugs). Application.</p> <p>Laxatives Drugs. Classification.</p> <p>The mechanism of action and the use of salt laxatives. Drugs that primarily affect the large intestine. Application. Sideeffects.</p> <p>Drugs that affect the tone and contractile activity of the myometrium.</p> <p>Medicinal Drugs Used to Enhance patrimonial activity. The effect of oxytocin on the myometrium. Pharmacological properties of prostaglandin preparations. Application.</p> <p>The use of β-adrenergic agonists as tocolytic agents.</p> <p>The mechanism of hemostatic action of ergot alkaloids in uterine bleeding.</p> <p>Drugs Affecting the Blood System</p> <p>Drugs affecting erythropoiesis. Drugs that stimulate erythropoiesis.</p> <p>Drugs used to treat hypochromic anemia. Iron preparations, the effect on blood formation.</p> <p>The use of recombinant human erythropoietins in case of anemia.</p> <p>The mechanism of the pharmacotherapeutic effect of cyanocobalamin, folic acid in hyperchromic anemia.</p> <p>Drugs that stimulate leukopoiesis. Mechanism of action. Indications for use.</p> <p>Platelet Aggressive Drugs</p> <p>Principles of action. Application.</p> <p>Drugs Affecting Blood Coagulation</p> |
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| | | | <p>Substances that promote blood coagulation.</p> <p>The mechanism of action of vitamin K preparations, Vikasol. Application. Drugs used topically to stop bleeding.</p> <p>Substances that prevent blood coagulation (anticoagulants). Mechanisms of action of heparin and indirect anticoagulants. Application. Complications Antagonists of anticoagulants of direct and indirect action.</p> <p>Drugs Affecting Fibrinolysis</p> <p>Fibrinolytic Drugs.</p> <p>Principle of action Indications for use.</p> <p>Antifibrinolytic Drugs. Operating principle. Indications for use.</p> |
| 6 | GC-1 GPC-8 PC-14 | Drugs Affecting on metabolic processes. | <p>Hormone preparations, their synthetic substitutes and antagonists.</p> <p>Classification. Sources of receipt.</p> <p>Hypothalamic and pituitary hormone preparations</p> <p>The effect of hormones of the anterior pituitary gland on the activity of endocrine glands. Properties and use of corticotropin, growth hormone, thyrotropin, lactin and preparations of gonadotropin hormones.</p> <p>The effect of hypothalamic hormones on the secretion of hormones of the anterior pituitary gland. Hypothalamic hormone preparations. Application.</p> <p>Hormones of the posterior pituitary gland. Properties of oxytocin and vasopressin preparations. Application. Thyroid Hormone Drugs and Antithyroid Drugs</p> <p>The effect of thyroxine and triiodothyronine on metabolism. Application.</p> <p>The physiological role and use of calcitonin. Principles of pharmacotherapy of osteoporosis.</p> <p>Antithyroid Drugs. Mechanisms of action. Application. Side effects. The preparation of the hormone of the parathyroid glands.</p> <p>The effect of parathyroidin on the exchange of phosphorus and calcium. Application.</p> <p>Insulin and Synthetic Hypoglycemic Drugs</p> <p>The effect of insulin on metabolism. Preparations</p> <p>prolonged-acting insulin.</p> <p>Principles of action of synthetic hypoglycemic agents for oral administration.</p> |

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| | | | <p>Indications for use. Side effects.</p> <p>Ovarian hormone preparations - estrogen and progestogen drugs</p> <p>The physiological significance of estrogens and gestagens. Application.</p> <p>Antiestrogenic and antigestagenic drugs. Application.</p> <p>The concept of hormonal birth control drugs for oral administration.</p> <p>Male sex hormone preparations (androgenic drugs)</p> <p>The effect of androgens on the body. Indications for use. Side effects.</p> <p>The concept of antiandrogenic drugs (androgen receptor blockers, 5α-reductase inhibitors). Application.</p> <p>Anabolic steroid</p> <p>Effect on protein metabolism. Indications and contraindications for use. Side effects.</p> <p>Adrenal cortex hormone preparations (deoxycorticosterone acetate, hydrocortisone acetate, prednisone, dexamethasone, triamcinolone, sinaflan, beclomethasone).</p> <p>Classification. The main effect of mineralocorticoids. The effect of glucocorticoids on the metabolism of carbohydrates, proteins, fats, ions, water. Anti-inflammatory and anti-allergic effect of glucocorticoids. Application. Complications</p> <p>Vitamin preparations. Preparations of water-soluble vitamins. The role of B vitamins in metabolism. Effect on carbohydrate, fat and protein metabolism. Participation in redox processes. Effect on the nervous and cardiovascular systems, gastrointestinal tract, blood formation, epithelial integument and regeneration processes. Indications for use of individual drugs.</p> <p>The participation of ascorbic acid in redox processes. Effect on the permeability of the vascular wall. Application. The effect of rutin on the permeability of tissue membranes.</p> <p>Preparations of fat-soluble vitamins. Retinol Effect on the epithelial integument. Participation in the synthesis of visual purpura. Indications for use. Side effects.</p> <p>Ergocalciferol, cholecalciferol. Effect on the exchange of calcium and phosphorus. Application. Side effects.</p> |
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| | | | <p>Phylloquinone. Its role in the process of blood coagulation. Application.</p> <p>Tocopherol, its biological significance, antioxidant properties. Application.</p> <p>Anti-Atherosclerotic Drugs</p> <p>Classification. Mechanisms of influence on lipid metabolism.</p> <p>Cholesterol synthesis inhibitors (lovastatin).</p> <p>Sequestrants of bile acids. Derivatives of Fibroic acids. Nicotinic acid and its derivatives. Antioxidants. Angioprotectors.</p> <p>Application. Side effects.</p> <p>Drugs that reduce uric acid in the body.</p> <p>The mechanism of action of uricosuric agents for gout.</p> <p>Indications and contraindications for use. Side effects Drugs that affect uric acid synthesis.</p> |
| 7 | GC-1 GPC-8 PC-14 | <p>Anti Inflammatory Drugs.</p> <p>Drugs Affecting on immune the processes</p> | <p>Steroidal anti-inflammatory Drugs.</p> <p>Anti-inflammatory mechanisms. Application. Side effect.</p> <p>Nonsteroidal Anti-Inflammatory Drugs.</p> <p>Anti-inflammatory mechanisms. Effect on different isoforms of cyclooxygenase. Selective COX-2 Inhibitors. Application. Side effects.</p> <p>Drugs Affecting Immune Processes</p> <p>Glucocorticoids. The mechanism of their antiallergic action.</p> <p>Antihistamine Drugs-blockers of histamine H1 receptors.</p> <p>Their comparative assessment. Application. Side effects.</p> <p>Immunosuppressive properties of cytostatic agents. The use of antiallergic agents in allergic reactions of delayed and immediate types.</p> <p>The use of adrenergic agonists (adrenaline) and myotropic bronchodilators (aminophylline) in anaphylactic reactions.</p> <p>Immunomodulators for systemic and local use (tactivin and other thymus preparations, levamisole, interferons, interferonogens, polyoxidonium, imudon).</p> <p>Principles of action, features of application. Sideeffects.</p> |
| 8 | GC-1 | Antimicrobial | Antiseptic and Disinfectant Drugs |

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| | <p>GPC-8 PC-14</p> | <p>Antiviral antifungal Drugs Anticancer Drugs</p> | <p>The concept of antiseptics and disinfection.</p> <p>The history of the use of antiseptic agents. Conditions determining antimicrobial activity.</p> <p>The main mechanisms of action of antiseptic agents on microorganisms.</p> <p>Detergents. The concept of anionic and cationic detergents. Their antimicrobial and detergent properties. Application.</p> <p>Derivatives of nitrofurans. Spectrum of antimicrobial action. Application.</p> <p>Antiseptics of aromatic series.</p> <p>Features of action and application.</p> <p>Metal compounds.</p> <p>Antimicrobial properties. Conditions determining antimicrobial activity. Local action (astringent, irritating and cauterizing effects). Features of the use of individual drugs.</p> <p>Characterization of resorptive action. Heavy metal salt poisoning. Help with poisoning. Principles of antidote therapy of poisoning.</p> <p>Halogenated compounds. Features of action and application.</p> <p>Oxidizing agents (hydrogen peroxide solution, potassium permanganate)</p> <p>Principles of action. Application.</p> <p>Aliphatic antiseptics.</p> <p>Antimicrobial properties. Application.</p> <p>Acids and alkalis. Antiseptic activity. Application.</p> <p>Dyes. Features of action and application.</p> <p>Different Drugs of Natural Origin.</p> <p>Features of action and application.</p> <p>Antibacterial Chemotherapeutic Drugs</p> <p>The history of the use of chemotherapeutic agents. The basic principles of chemotherapy. Criteria for evaluating chemotherapeutic drugs.</p> <p>Antibiotics</p> <p>History of the production and use of antibiotics. The main mechanisms of action of antibiotics. The principles of classification. The concept of primary and backup antibiotics.</p> <p>Penicillin antibiotics. Range of action. Routes of administration, distribution, duration of action and dosing of biosynthetic penicillins. Features of the action and</p> |
|--|-------------------------------|---|---|

| | | | |
|--|--|--|---|
| | | | <p>application of semisynthetic penicillins (narrow and wide spectrum). Combined preparations of semisynthetic penicillins with β-lactamase inhibitors.</p> <p>General characteristics of cephalosporins I-IV generations. Differences in the spectrum of antimicrobial action.</p> <p>Carbapenems. The combination of imipenem with dipeptidase inhibitors (cilastatin).</p> <p>Monobactams. Range of action, application.</p> <p>Spectrum of action and use of glycopeptides.</p> <p>Properties of antibiotics of the macrolide and azalide group.</p> <p>Features of the action and use of lincosamides.</p> <p>The spectrum of action, route of administration, distribution, duration of action and dosage of tetracycline antibiotics.</p> <p>Properties of chloramphenicol. Side effects.</p> <p>Aminoglycosides. Properties of streptomycin and other aminoglycosides. Side effect.</p> <p>Polymyxins. Features of the action. Side effects.</p> <p>Antibiotics of different chemical structure.</p> <p>Complications of antibiotic therapy, manifestations of side and toxic effects, antibiotics, prevention and treatment.</p> <p>Sulfanilamide preparations.</p> <p>The mechanism and spectrum of antibacterial action. Absorption, distribution, biotransformation and excretion. Duration of action, dosage of drugs. Possible complications when using sulfonamides, their prevention and treatment.</p> <p>The combined use of sulfonamides with trimethoprim. Operating principle.</p> <p>Quinolone derivatives.</p> <p>The mechanism and spectrum of antibacterial action of nalidixic acid. Features of fluoroquinolones (spectrum of activity, rate of development of bacterial resistance). Indications for use, side effects.</p> <p>Synthetic Antimicrobial Drugs of Different Chemical Structure.</p> <p>Spectra of the antibacterial action of drugs of different chemical structures.</p> |
|--|--|--|---|

| | | | | | | | |
|---|---|----|-----|--|--|----|----|
| | | | | | | | |
| 1 | General recipe | | 12 | | | 5 | 17 |
| 2 | General Pharmacology | 2 | 3 | | | 5 | 10 |
| 3 | Drugs, regulating functions of the peripheral nervous system | 4 | 18 | | | 10 | 32 |
| 4 | Drugs Regulating Central Nervous Function | 8 | 18 | | | 10 | 36 |
| 5 | Medicinal Drugs Regulating The Function Of The Executive Organs And Systems | 2 | 6 | | | 5 | 13 |
| 6 | MetabolicDrugs | 12 | 33 | | | 17 | 62 |
| 7 | Medicinal drugs that inhibit inflammation and affect immune processes | | 3 | | | 5 | 8 |
| 8 | Antimicrobial Antiviral and Antiparasitic Drugs | 4 | 18 | | | 16 | 38 |
| | | | | | | | |
| | TOTAL | 32 | 111 | | | 73 | |

5.3. Title of lecture topics with hours

| № lecture | Section of the discipline | Lecture topics Titles | Number of hours per semester | |
|-----------|--|---|------------------------------|----|
| | | | V | VI |
| 2 | General pharmacology. | L.1 Introduction. General pharmacology | 2 | |
| 3 | Drugs regulating functions of the nerves system peripheral segment | L.2 Cholinomimetic anticholinergic anticholinesterase drugs. | 2 | |
| | | L.3 Adrenomimetic Drugs. Adrenergic Blocking and Sympatholytic Drugs. | 2 | |
| 4 | Drugs regulating CNS functions | L.4 Drugs for anesthesia. Ethanol. Sleeping Pills Drugs | 2 | |
| | | L.5 Narcotic analgesics. Non-narcotic analgesics | 2 | |
| | | L.6 Antiepileptic Drugs. Antiparkinsonian drugs | 2 | |

| | | | | |
|---|---|---|-----------|-----------|
| | | L.7 Antipsychic Drugs. Antidepressants. Lithium salts. Anxiolytics. Sedative Drugs. Psychostimulating Drugs. NootropicDrugs. Analeptics. | 2 | |
| 5 | Drugs regulating metabolic processes | L.8 Hormonas. Vitamins | 2 | |
| 6 | Drugs regulating executive organs and systems functions | L.9 CardiotoxicDrugs | | 2 |
| | | L.10 Antiarrhythmics. | | 2 |
| | | L.11 Antianginal drugs | | 2 |
| | | L.12 Antihypertensives. Diuretics | | 2 |
| | | L.13 Drugs affecting respiratory system | | 2 |
| | | L.14 Drugs affecting blood system | | 2 |
| 8 | Antimicrobial, antiviral, antiparasite drugs | L.15 Main principles of chemotherapy. Antibioti cs. | | 2 |
| | | L.16. Sulfanilamide preparations. Synthetic Antimicrobial Drugs of Different Chemical Structure | | 2 |
| | TOTAL | | 16 | 16 |

5.4. The names of the practical classes topics with the number of hours

| № section | Section of the discipline | Topics of practical classes | Forms of current control | Number of hours per semester | |
|-----------|--|---|--------------------------------|------------------------------|----|
| | | | | V | VI |
| 1 | General recipe | PC.1 Recipe. Solid drug forms | Prescriptions forms of writing | 3 | |
| | | PC.2 Soft drug forms | Prescriptions forms of writing | 3 | |
| | | PC.3 Liquid drug forms | Prescriptions forms of writing | 3 | |
| | | PC.4 Final lesson on the | T. Recipe | 3 | |
| 2 | General Pharmacology | PC.5 General Pharmacology | S.T | 3 | |
| 3 | Drugs, regulating functions of the peripheral nervous system | PC.6 Anesthetizing, Enveloping, Astringent, Adsorbing and Irritating Drugs. | S.T. Recipe ST | 3 | |
| | | PC.7Cholinomimetic and Anticholinesterase Drugs | S.T. Recipe | 3 | |
| | | PC.8 M, N- cholinoblockers | S.T. Recipe ST | 3 | |
| | | PC.9 Adrenomimetics, sympathomimetics | S.T. Recipe ST | 3 | |
| | | PC.10 Adrenoblockers and Sympatholytics. | S.T. Recipe ST | 3 | |
| | | PC.11 The final lesson on the topic: "Drugs that affect peripheral innervation." | T. Recipe | 3 | |
| 4 | . Drugs regulating CNS functions | PC.12 Drugs for anesthesia. Ethanol.Sleeping Pills. | S.T. Recipe | 3 | |
| | | PC.13 Painkillers (Analgesics). | S.T. Recipe P | 3 | |
| | | PC.14 Antiepileptic Drugs. Anti-Parkinsonian Drugs | S.T. Recipe | 3 | |
| | | PC.15 Neuroleptics Antidepressants. Lithium salts. | S.T. Recipe | 3 | |
| | | PC.16 Anxiolytics. Sedative Drugs. Psychostimulating Drugs. Nootropics. Analeptics. | S.T. Recipe | 3 | |
| | | PC.17 Final lesson: "Drugs Affecting the Central Nervous System | T. Recipe | 3 | |
| 5 | Drugs regulating metabolic processes | PC.18 Vitamines | S.T. Recipe | 3 | |
| | | PC.19 Hormonal drugs | S.T. Recipe | 3 | |
| 6 | Medicinal Drugs Regulating The Function Of The | PC.20 Cardiotonics | S.T. Recipe ST | | 3 |
| | | PC.21 Antiarrhythmics | S.T. Recipe ST | | 3 |
| | | PC.22 Drugs used for coronary circulatory failure (antianginal drugs) | S.T. Recipe ST | | 3 |

| | | | | | |
|---|---|---|----------------|--|----------|
| | Executive Organs And Systems | PC.23 Antihypertensive Drugs Hypertensive Drugs. | S.T. Recipe ST | | 3 |
| | | PC.24 DiureticDrugs. | S.T. Recipe ST | | 3 |
| | | PC.25 Final lesson on the topics: “Drugs Affecting the Cardiovascular System” and “Diuretic Drugs”. | T. Recipe | | 3 |
| | | PC.26 Drugs that affect respiratory function. | S.T. Recipe ST | | 3 |
| | | PC.27 Drugs that affect digestive function. | S.T. Recipe ST | | 3 |
| | | PC.28 Drugs affecting blood formation. Drugs affecting platelet aggregation. Drugs affecting blood coagulation and fibrinolysis | S.T. Recipe ST | | 3 |
| | | PC.29 Drugs affecting myometrium | S.T. Recipe P | | 3 |
| | | PC.30 Final lesson on the topic: “Drugs that affect the functions of the executive organs” | T. Recipe ST | | 3 |
| 7 | Medicinal drugs that inhibit inflammation and affect immune processes | PC.31 Medicinal drugs that inhibit inflammation and affect immune processes. | S.T. Recipe ST | | 3 |
| 8 | Antimicrobial, antiviral, antiparasite drugs | PC.32 Antiseptics and Disinfectant Drugs. Antibiotics I | S.T. Recipe | | 3 |
| | | PC.33 Antibiotics II | S.T. Recipe | | 3 |
| | | PC.34 Sulfanilamide preparations. Quinolone derivatives. Synthetic Antimicrobial Drugs of Different Chemical Structure. | S.T. Recipe | | 3 |
| | | PC.35 Anti-TB Drugs Anti-Syphilitic Drugs Anti-Viral Drugs | S.T. Recipe | | 3 |
| | | PC.36 Antiprotozoal Drugs Antifungal Drugs Anthelmintic Drugs Antineoplastic Drugs | S.T. Recipe | | 3 |
| | | PC.37 Final lesson on the topic: “Chemotherapeutic drugs” | T. Recipe ST | | 3 |
| | | TOTAL: | | | |

Laboratory practical work is not provided.

5.6. Educational provisions for the self-study in the discipline

5.6.1 A student’s self-study

| No No | Section of the discipline | Name of the work | Labour capacity (hours) | Forms of control |
|---------------|---|---|-------------------------|------------------|
| 1 | General recipe | Work with literature sources, assignments in the form of prescribing for various drug forms | 5 | Recipe |
| 2 | General Pharmacology | Work with sources of literature, including lecture material, writing an essays | 5 | P |
| 3 | Drugs, regulating functions of the peripheral nervous system | Work with sources of literature, including lecture material, completing assignments in the form of prescribing in accordance with the "List of curriculum drugs", writing an essays, situational tasks | 10 | T |
| 4 | Drugs regulating CNS functions | Work with sources of literature, including lecture material, completing assignments in the form of prescribing in accordance with the "List of curriculum drugs", writing an essays, situational tasks | 10 | T,ST,P |
| 5 | Drugs regulating metabolic processes | Work with literature sources, including lecture material, assignments in the form of prescribing in accordance with the "List of curriculum drugs" | 5 | T |
| 6 | Medicinal Drugs Regulating The Function Of The Executive Organs And Systems | Working with literature sources, including lecture material, completing assignments in the form of prescribing in accordance with the List of curriculum drugs" | 20 | T,ST,P |
| 7 | Medicinal drugs that inhibit inflammation and affect immune processes | Work with literature sources, including lecture material, assignments in the form of prescribing in accordance with the "List of curriculum drugs" | 5 | T |
| 8 | Antimicrobial, antiviral, antiparasite drugs | Work with literature sources, including lecture material, assignments in the form of prescribing in accordance with the "List of curriculum drugs"; | 18 | T,ST |
| | Preparation to the exam* | Repetition and consolidation of what has been learned material (work with lecture material, educational literature); formulation of questions; pre-examination individual and group consultations with teacher. | 24 | E |
| TOTAL: | | | | 73 |

5.6.2. Subjects of abstract works (GPC-8, PC-14)

1. Principles of therapy of poisoning by pharmacological substances. (GPC-8)
2. Interaction and incompatibility of drugs. (GPC -8, PC-14)
3. Narcotic analgesics. (GPC-8)

4. Means that cause drug dependence. (GPC -8)
5. Use of transdermal narcotic analgesics for the pain syndrome relief. (GPC -8)
6. The use of naloxone in the treatment of withdrawal symptoms. (GPC -8)
7. Benefits of fentanyl transdermal use in severe chronic pain. (GPC -8)
8. Modern drugs that affect tone and contractility myometrial activity. (GPC -8)
9. Herbal preparations that increase the tone of the myometrium. (GPC -8)
10. Drugs of different groups that affect contractile activity myometrium. (GPC -8)

5.6.3. Guidelines for students on mastering the discipline

(Appendix No. 3)

VI. EVALUATION TOOLS FOR ONGOING PERFORMANCE MONITORING AND MIDTERM CERTIFICATION ON THE RESULTS OF MASTERING THE DISCIPLINE

6.1. Current progress monitoring

6.1.1. List of competencies indicating the stages of their formation in the process mastering the work program of the discipline

| No | Name of the discipline section (module) | The code of the controlled competency | Forms of control |
|----|---|---------------------------------------|-----------------------------------|
| 1 | General recipe | PC-1, GPC-8 | 1. Test-paper |
| 2 | General Pharmacology | PC-1, GPC-8 | 1. Interview |
| | | | 2. Test-paper |
| 3 | Drugs, regulating functions of the peripheral nervous system | PC-1, GPC-8, PC-14 | 1. Test-paper on prescription |
| | | | 2. Interview on situational tasks |
| | | | 3. Written test paper |
| 4 | Drugs regulating CNS functions | PC-1, GPC-8, PC-14 | 1. Test-paper on prescription |
| | | | 2. Interview on situational tasks |
| | | | 3. Written test paper |
| 5 | Drugs regulating metabolic processes | PC-1, GPC-8, PC-14 | 1. Test-paper on prescription |
| | | | 2. Interview on situational tasks |
| | | | 3. Written test paper |
| 6 | Medicinal Drugs Regulating The Function Of The Executive Organs And Systems | PC-1, GPC-8 | 1. Test-paper on prescription |
| | | | 2. Interview on situational tasks |
| | | | 3. Written test paper |
| 7 | Medicinal drugs that inhibit inflammation and affect immune processes | PC-1, GPC-8, PC-14 | 1. Test-paper on prescription |
| | | | 2. Interview on situational tasks |
| | | | 3. Written test paper |

| | | | |
|---|--|-------------|-----------------------------------|
| 8 | Antimicrobial, antiviral, antiparasite drugs | PC-1, GPC-8 | 1. Test-paper on prescription |
| | | | 2. Interview on situational tasks |
| | | | 3. Written test paper |

6.1.2. Examples of assessment tools for current and midterm monitoring of academic performance

Control interview.

Theme of the lesson number 7. Cholinomimetics and anticholinesterase agents.

Codes of controlled competencies: GC-1, GPC-8, PC-14.

1. Muscarino- and nicotine-sensitive receptors (M- and N-cholinergic receptors). Subtypes of M- and H-cholinergic receptors.
2. Classification of agents affecting the transmission of excitation in cholinergic synapses.
3. M-cholinomimetics. Effects arising from the excitation of different subtypes M-cholinergic receptors. The effect of M-cholinomimetics on the eye (pupil size, intraocular pressure, accommodation), smooth muscles of internal organs, secretion of glands, heart and tone of blood vessels. Use.
4. Treatment of poisoning with M-cholinomimetics.
5. N-cholinomimetics. Effects associated with influence on H - cholinergic receptors sinocarotid zone of chromaffin cells of the adrenal medulla. Use.
6. Toxic effect of nicotine. The use of H - cholinomimetic agents for facilitate smoking cessation.
7. M-N-cholinomimetics. Main effects of acetylcholine and carbacholine (muscarino and nictatin-like action). Indications for use. Side effects
8. Anticholinesterase agents. The nature of the interaction with acetylcholinesterase. main effects. Comparative characteristics of drugs. Indications for use. Side effects and toxic effects of anticholinesterase agents. Treatment of poisoning. The use of cholinesterase reactivators in case of poisoning with organophosphate compounds.

Criteria for assessing the current control of progress (interview on control questions):

"Excellent":

The student has a deep knowledge of the educational material on the topic of practical classes. He formulates a complete and correct answer to the questions of the topic of the lesson, with compliance with the logic of the presentation of the material, shows the assimilation of the relationship of the main concepts used in the work, was able to answer all clarifying and additional questions. The student demonstrates knowledge of theoretical and practical material on the topic of the lesson.

"Good":

The student shows knowledge of the educational material, mastered the basic literature, and is able to answer almost completely all the additional and clarifying questions. Student demonstrates knowledge of theoretical and practical material on the topic of the lesson, with minor inaccuracies.

"Satisfactory":

The student as a whole masters the material of the practical lesson, but does not answer all clarifying and additional questions. The student has difficulty with the correct assessment of the proposed task, gives an incomplete answer, requiring teacher's hinting questions

"Unsatisfactory":

The student has significant gaps in the knowledge of the main educational material practical lesson. He does not fully disclose the content of the questions, and cannot answer clarifying and additional questions. The student gives an incorrect assessment of the situation, incorrectly chooses the algorithm of actions. Unsatisfactory grade is given to a student who refuses to answer questions on the topic of a practical lesson.

TESTING CONTROL

Section 3. Drugs affecting the peripheral nervous system

Codes of controlled competencies: GC-1, GPC-8, PC-14.

Variant 2.

1. The mechanism of action of dithylin (select several correct answers):

- A. Causes blockade of M-cholinergic receptors.
- B. Causes persistent depolarization of the membrane.
- B. Violates neuromuscular transmission.
- D Blocks H-cholinergic receptors by the type of competition with acetylcholine.

2. Atropine removes bradycardia and AV block because (choose one correct answer):

- A. Blocks M-cholinergic receptors and reduces the effect of the vagus nerve on the heart.
- B. Stimulates β -adrenergic receptors and increases the activity of the sympathetic nervous systems.
- B. Blocks slow calcium channels and reduces myocardial contractility.
- G. Blocks potassium channels and slows down the rate of repolarization.

3. Contraindication to the use of atropine is (select one correct answer):

- A. Renal colic.
- B. Peptic ulcer of the stomach.
- B. Acute myocarditis.
- G. Glaucoma.
- D. Myasthenia gravis.

4. The indication for the use of atropine as an emergency aid is (choose one correct answer):

- A. Anaphylactic shock.
- B. AV block.

- B. Overdose of peripheral muscle relaxants.
 - G. Hypoglycemic coma.
 - D. Hypertensive crisis.
5. An undesirable effect when using atropine is (select one correct answer):
- A. Dry mouth.
 - B. Bronchospasm.
 - B. Bradycardia.
 - D. Increased intracranial pressure.
 - D. Orthostatic hypotension.
6. Localization of α -adrenergic receptors (select several correct answers):
- A. Endings of parasympathetic nerves.
 - B. Sympathetic nerve endings.
 - B. Circular muscle of the iris.
 - D. Radial muscle of the iris.
 - D. Liver.
7. Localization of β -adrenergic receptors (select several correct answers):
- A. Bronchi.
 - B. Circular muscle of the iris.
 - B. Radial muscle of the iris.
 - G. Liver.
 - D. Heart.
8. α - adrenomimetics (select several correct answers):
- A. Ephedrine.
 - B. Reserpine.
 - B. Adrenaline.
 - G. Mezaton.
 - D. Methyldopa.
9. β -agonists (select several correct answers):
- A. Lobelin.
 - B. Orciprenaline.
 - B. Ephedrine.
 - G. Izadrin.
 - D. Anaprilin.

Criteria for assessing the current control of progress (testing):

"Excellent": 100-90%

"Good": 89-70%

"Satisfactory": 69-51%

"Unsatisfactory": <50%

SITUATIONAL TASKS

Codes of controlled competencies: GC-1, GPC-8, PC-14.

Task number 1.

An 8-year-old boy with a foreign body in the eye turned to the rural hospital for help. So his father's words - possibly metal shavings. For a detailed examination and operation on the removal of a foreign body requires anesthesia. The hospital has only dosage forms of procaine (novocaine) and benzocaine (anesthesin). In the pharmacy, located in the village, you can get by prescription the necessary, chosen by the doctor, medicine.

Question 1. Can they use the above mentioned local anesthetics available in hospital?

Question 2. Which of the drugs is best used for terminal anesthesia in this case?

Question 3. If necessary, with what note will the doctor write out a prescription to speed up preparation of a dosage form of a medicinal product?

Task number 2.

In summer, a 30-year-old man was found in a park area in the position lying on his side, with clouded consciousness. Breathing speeded up, pulse 90 beats / min.; BP - 130/90; skin covers are pale; pupils are dilated. After 10 min. breathing became rare, superficial, clonic convulsions appeared, lips became cyanotic, lost consciousness, BP - 80/40. Alcohol poisoning is excluded. With more careful examination paid attention to the atrophy of the nasal mucosa.

Question 1. Presumptive diagnosis (with justification).

Question 2. Assistance measures.

Question 3. Forecast

Criteria for assessing the current monitoring of progress (situational tasks):

"Excelent":

The answer to the question is correct. Explanation of the course of her decision in detail, consistent, competent, with theoretical justifications (including from the lecture course), with the necessary schematic images, answers to additional questions are clear and direct.

"Good":

The answer to the question is correct. Explanation of the course of her decision in detail, but not logical enough, with single errors in details, some difficulties in theoretical justification (including from lecture material), in schematic representations with single errors; answers to additional questions are correct, but not clear enough.

"Satisfactorily":

The answer to the question is incorrect. Explanation of the course of its solution insufficiently complete, inconsistent, with errors, weak theoretical substantiation (including lecture material), with significant difficulties and errors in schematic drawings, answers to additional questions not clear enough, with errors in details.

"Unsatisfactory":

The answer to the question is given incorrectly. An explanation of the course of its solution is given incomplete, inconsistent, with gross errors, without theoretical justification (in including lecture material) answers to additional questions are wrong (missing).

6.2. Intermediate certification based on the results of mastering the discipline

6.2.1. Form of intermediate certification "exam": exam - semester VI

6.2.2. Intermediate certification procedure

a) oral interview

6.2.3. Example questions for preparing for the exam:

Sections "General pharmacology" and "Drugs affecting the peripheral nervous system" (GC-1, GPC-8, PC-14)

1. Pharmacokinetics of drugs: routes of administration, absorption, distribution of drugs in the body. biological barriers. Deposit.
2. Chemical transformations (biotransformation, metabolism) of drugs in the body and the route of excretion of drugs.
3. Pharmacodynamics of drugs: types of action, localization and mechanism actions. Receptors. The main and side effects of drugs.
4. Dependence of the pharmacotherapeutic effect on the properties of drugs and conditions of their use, physicochemical properties, doses and concentrations, reuse of drugs.
5. Interaction of drugs. Types of interaction (pharmaceutical, pharmacological). Medicines interaction mechanism.
6. Substances that have a protective effect on nerve endings. Classification. Mechanism of action. Pharmacological characteristics drugs. Use. Irritants. Mechanism of action.
7. Local anesthetics. Classification. Mechanism of action. Requirements for local anesthetics. Comparative drug characteristics. Application. Side effects.
8. Cholinergic synapse, its structure. Classification of funds affecting transmission of excitation at cholinergic synapses. Examples of drugs.
9. M-, N-cholinomimetic agents. The main effects of acetylcholine and carbachol. Side effects.

6.2.4. Card example

MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION
Federal State Budgetary Educational Institution of Higher Education

"Dagestan State Medical University"

EXAMINATION CARD №. 1

In the discipline "Pharmacology"

For the 3rd year students of the specialty

"General Medicine"

1. Types of action of drugs on the body. Cellular "targets" medicinal substances. The concept of receptors, secondary transmitters, ionic channels, agonists and antagonists.
2. M-anticholinergics. Mechanism of action. Preparations. Pharmacological effects. Indications and contraindications for use. Adverse reactions when applying them.
3. Antiarrhythmic drugs. Classification. The main properties of funds, blocking sodium channels (membrane stabilizing).
4. Write out in the form of a prescription and determine the group affiliation and indications for the use of - anaprilin

The card was compiled by c.m.s., head of the department. Magomedova Z.Sh.

Approved at a meeting of the department, protocol dated August 28, 2020. No. 14

Head of the Department: Candidate of Medical Sciences,
Associate Professor

Magomedova Z.Sh.

6.2.5. The system for evaluating the results of mastering the discipline, description of the scales

| Assessment Metrics | Evaluation criteria | | | |
|-------------------------|--|---|---|---|
| | "unsatisfactory" (minimum level not reached) | "satisfactorily" (minimum level) | "Good" (average level) | "Excellent" (high level) |
| GC-1,GPC-8,PC-14 | | | | |
| To know | The student is unable to single out main points in studied disciplines material. He doesn't know basic material disciplines content | student learned main content discipline material, but has gaps in mastering the material, without obstructing further assimilation educational material.He has unsystematic | The student is able on one's own analyze training material The student is able Use knowledge for generalizations educational material | The student independently singles out the main provisions in the studied material and is able to give a brief characterization of the main ideas of the studied material of the |

| | | | | |
|----------------------|---|---|---|---|
| | | knowledge about the main provisions in the studied material | | discipline. Knows the main provisions of the educational material. Shows a deep knowledge and understanding of the discipline |
| To be able to | The student is unable to express main points educational material | Student experiences difficulties in action analysis medicines in their totality pharmacological properties and possibility their use for therapeutic treatment. Student inconsistently and systematized outlines the educational material The student finds it difficult when generalizing educational material | The student is able on one's own to analyze training material. The student is able to use knowledge for generalizations educational material | The student is able to consistently present the educational material The student is able to independently analyze the effect of drugs in terms of the totality of their pharmacological properties and the possibility their use |
| To possess | The student does not have the skill to use medicines | The student has basic application skills of medicines for the treatment, rehabilitation and prevention of various diseases and pathological conditions. | The student has knowledge of everything studied program material, the material sets out consistently rarely tolerates minor errors and shortcomings in the reproduction of the studied material. The student is able to | The student independently singles out the main provisions in the studied material and is able to give a brief description of the main ideas of the studied material. The student has the skill of determining practical skills The student shows a deep |

| | | | | |
|--|--|--|---|--|
| | | | independently highlight the main provisions of the educational material | and complete knowledge of the entire volume of the studied discipline in terms of practical skills |
|--|--|--|---|--|

| | | |
|-------------------------------|--|--|
| Competencies are not mastered | According to the results of the control activities received result less than 50% | Basic questions not answered disciplines |
| A basic level of | Based on the results of control measures, result 50-69% | Answers to questions and solutions tasks are not complete enough. Logic and sequence in solving problems. There are no conclusions in the answers. |
| Average level | According to the results of the control activities received result 70-84% | He gives complete answers to questions. The ability to distinguish causal relationships. When solving tasks made minor errors, corrected with the help of "hinting" teacher questions. |
| Advanced level | According to the results of the control activities received result above 85% | Complete answers to the questions clear and expanded. Problem solving logical, evidence-based and demonstrate analytical and creative skills student |

VII. EDUCATIONAL AND METHODOLOGICAL AND INFORMATION SUPPORT OF THE DISCIPLINES

7.1. The list of basic and additional literature necessary for mastering the discipline

Printed Sources:

| № | Editions | The number of copies in the library |
|---|--|-------------------------------------|
| 1 | Pharmacology: textbook / under. ed. D.A. Kharkevich.-10th ed., Rev. and add. - M.: IG Geotar-Media - 2010. | 300 |
| | Pharmacology: textbook / under. ed. D.A Kharkevich.-11th ed., Rev. and add. - M.: IG Geotar-Media - 2013 | 100 |
| | Pharmacology: textbook / under. ed. D.A. Kharkevich.-12th ed., Rev. and add. - M.: IG Geotar-Media - 2017 | 100 |

Electronicsources:

| | |
|---|--|
| 1 | Pharmacology: [Electronic resource] textbook / under. ed. D.A. Kharkevich. M.: IG Geotar-Media - 2013 http://www.studmedlib.ru/book/ISBN9785970424278.html |
| 2 | Pharmacology: [Electronic resource] textbook / under. ed. R.N. Alyautdina. -5th ed., Rev. and add. - M.: IG Geotar-Media 2016 http://www.studmedlib.ru/book/ISBN9785970437339.html |

7.2. additionalliterature

PrintedSources:

| № | Editions | The number of copies in the library |
|---|---|-------------------------------------|
| 1 | Pharmacology: test items, under. ed. D. A. Kharkevich .-- M.: IG Geotar-Media - 2011. | 200 |
| 2 | Guide to laboratory studies in pharmacology: under. ed. D. A. Kharkevich .-- M.: IG Geotar-Media - 2004/2014. | 487/100 |
| 3 | Pharmacology in questions and answers. Edited by A. Ramachandran. .-- M.: IG Geotar-Media, 2009 | 99 |
| 4 | Visual Pharmacology, ed. Neil M.D., 2001 | 48 |
| 5 | Fundamentals of Pharmacology., Ed. D.A. Kharkevich, Moscow: GEOTAR-Media, 2015 | 1 |
| 6 | Pharmacology, ed. V.V. Maisky, 2003 | 20 |

PrintedSources:

| № | Editions |
|---|--|
| 1 | 2 |
| 1 | Fundamentals of Pharmacology [Electronic resource]: textbook / ed. D.A. Kharkevich, Moscow: GEOTAR-Media, 2016. - http://www.studmedlib.ru/book/ISBN9785970434925.html |
| 2 | Pharmacology: lecture course [Electronic resource]: textbook / A.I. Vengerovsky. - 4th ed., Revised. and add. M .: GEOTAR-Media, 2015. http://www.studmedlib.ru/book/ISBN9785970433225.html |
| 3 | Pharmacology: a guide to laboratory studies [Electronic resource]: D. A. Kharkevich, E.Yu. Lemina, V.P. Fisenko, O.N. Chichenkov, V.V. Churyukanov, V.A. Shorr -. - M .: GEOTAR-Media, 2012. - http://www.studmedlib.ru/book/ISBN9785970419885.html |

7.3 The list of resources of the information and telecommunication network "Internet»:

| № | ResourceName | Websiteaddress |
|----|----------------|---|
| 1. | PubMed MEDLINE | http://www.pubmed.com |

| | | |
|-----|--|--|
| 2. | Google scholar | http://scholar.google.com |
| 3. | Scirus | http://www.scirus.com/srapp |
| 4. | Medicalnews | info@univadis.ru |
| 5. | HealthIssues. WHO Information | http://www.who.int/en/ |
| 6. | Ministry of Education and Science of the Russian Federation | http://минобрнауки.рф |
| 7. | Ministry of Health of the Russian Federation | http://www.rosminzdrav.ru |
| 8. | MinistryofHealth RD | http://minzdravrd.ru |
| 9. | CyberLeninkScientificElectronicLibrary | http://cyberleninka.ru |
| 10. | ElectronicScienceLibrary | https://elibrary.ru/defaultx.asp |
| 11. | Federal Electronic Medical Library (FEMB) | http://feml.scsml.rssi.ru |
| 12. | MedicalSearchEngine | http://www.medinfo.ru/ |
| 13. | Faculty of Fundamental Medicine, Moscow State University M.V. Lomonosov (publications). | http://www.fbm.msu.ru/sci/publications/ |
| 14. | Directoryofdrugs. | http://www.rlnet.ru/ |
| 15. | Electronic library of the Russian Federal Property Fund. | http://www.rfbr.ru/ |
| 16. | State Central Scientific Medical Library. | http://www.scsml.ru// |
| 17. | Nedug.ru (medical information service). | http://www.nedug.ru/ |
| 18. | LibrariesontheInternet. | http://guide.aonb.ru/libraries1.htm |
| 19. | Science and education on the Internet. | http://guide.aonb.ru/nauka.htm |
| 20. | Electroniclibraryoftextbooks. | http://studentam.net |
| 21. | Library. | www.MedBook.net.ru |
| 22. | Electronicmedicalbooks. | http://www.med.book.net.ru/21shtm |
| 23. | Portaltutorials - free RF. | http://учебники- бесплатно.рф/http://sci-book.com/ |

7.4 . INFORMATION TECHNOLOGY

When studying the discipline, a general package of documents of Internet materials is used that provide ample opportunity to improve university training in pharmacology with the aim of mastering the skills of educational activities. The standard features of most programs are the implementation of the didactic principle of visualization in training; their use enables students to apply various methods to solve the educational problem.

Teaching methods using information technology.

The methods of training using information technology used in the classroom "Pharmacology" include:

- demonstration of multimedia materials;
- A list of search engines (site moodle.dgmu.ru).
- list of encyclopedic sites

VII.MATERIAL AND TECHNICAL SUPPORT

Information about the material and technical support necessary for the implementation of the educational process in the discipline

| № no | Address (location) buildings, structures facilities premises | Ownership or operational management, household maintenance, rental, sublease, gratuitous use | Name of disciplines | Appointment equipped buildings, premises *, territories with indication of area (sq.m.) | Name of special rooms and premises for independent work | Equipped with special rooms and rooms for independent work | The list of licensed software. Details of the supporting document |
|------|--|--|---------------------|---|--|--|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Sh.Aliyev St. 1, 3rd floor | Oper. control. | Pharmacology | For educational and scientific educational process 120 sqm | <ul style="list-style-type: none"> • • for lecture classes - • Halls No. 2 and No. 3 of the Biocorpus, • Hall. morphocorpus • • for practical training (auditorium No. 1,2,3,4,5,6) • • Assistant No. 7 • • Associate Professor №8 • • Cab. Headchair | For lecture classes: ----- Lenovo -2 laptops Epson 3 projectors for practical exercises: ----- Personal computers-2; MFP HPLJ-1-1; MFP Kyocera 1 | The list of software (Win HOME 10 Russian OLP (Sublicense agreement Tr000044429 dated 12/08/15); Kaspersky Edition Security for Business - Standard Russian Edition. 100-149 Node (License agreement No. 1081-2015 dated 10/14/2015); Office ProPlus 2013 RUS OLP NL Acdmc (Agreement No. ДП-026 dated 10.16.13), etc.) |

IX. STAFF RESOURCES

| | Full name of teacher | Terms of attraction (full-time, internal part-time, external part-time, by agreement) | Occupied position, scientist power/scientist rank | Education (which educational institution of vocational education graduated, year) | The level of education, the name of the specialty according to the diploma, the name of the assigned qualification | Total work experience | Work experience on the profile of the educational program in relevant organizations with an indication of the period of work and position |
|----------|--------------------------------|---|---|---|--|-----------------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | Hanmurzaeva Naida Bagavdinovna | ft | senior lecturer, PhD | DSMA, 2007 | Specialty, medical care, medical doctor | 4 | 4 |
| 2 | Shugaeva KarinaYaragievna | ft | senior lecturer, PhD | DSMA, 2006 | Specialty, medical care, medical doctor | 5 | 5 |

X. USE OF INNOVATIVE (ACTIVE AND INTERACTIVE) TEACHING METHODS

Active teaching methods used in the study of this discipline make up 10% of the classroom volume.

| | Name of the section (list those sections in which are used active and/or interactive forms (methods) training) | Type, name of the topic of the lesson with using forms of active and interactive teaching methods | Labor intensity* (hour.) |
|---|--|---|-----------------------------|
| 1 | Medicinal facilities, regulating Functions of the central nervous system | Lecture "Narcotic and non-narcotic analgesics. Problematic lecture | 2 |
| 2 | Drugs that regulate functions executive bodies and systems | Practical lesson Antihypertensives". Seminar-discussion on the type of "Educational the conference" | 3 |
| 3 | Antimicrobial, antiviral, antifungal agents. Antiblastoma and immunoactive facilities | Practical lesson "Antibiotics". Solving multi-level tasks at the stage of classroom independent work. | 3 |

XI. METHODOLOGICAL SUPPORT OF THE DISCIPLINE

Guidelines for students - Appendix No. 3 (attached)

XII. FEATURES OF DISCIPLINE TRAINING ORGANIZING FOR THE DISABLED AND PERSONS WITH DISABLED HEALTH

12.1. Education of disabled people and persons with disabilities

If necessary, it is carried out by the department on the basis of an adapted working programs using special teaching methods and didactic materials compiled taking into account the peculiarities of psychophysical development, individual capabilities and health status of such students (student).

12.2. In order to master the curriculum of the discipline by disabled people and persons with Disabled Health the department provides:

- 1) for the disabled and persons with visual impairments:
 - placement in accessible to students who are blind or visually impaired, locations and in an adapted form of background information about the schedule training sessions;
 - the presence of an assistant providing the student with the necessary assistance;
 - release of alternative formats for teaching materials (large print or audio files);
- 2) for the disabled and people with hearing disabilities:
 - appropriate sound means of reproduction of information;
- 3) for the disabled and persons with disabilities who have musculoskeletal disorders:
 - the possibility of unhindered access of students to classrooms, toilet rooms and other premises of the department. In case of impossibility unhindered access to the department to organize the educational

process in a specially equipped center for individual and collective use of special technical training aids for the disabled and people with disabilities health opportunities (1 A.Aliyev str., biological building, 1st floor).

12.3. The education of students with disabilities can be organized both jointly with other students and in separate groups.

12.4. The list of educational and methodological support for independent work of students in the discipline.

Educational and methodological materials for independent work of students from among the disabled and persons with disabilities are provided in forms adapted to the limitations of their health and perception of information:

| Categories of students | Forms |
|--|--|
| hearing impairment | - in printed form; - in the form of an electronic document; |
| With visual impairment | - in printed form in enlarged type; - in the form of an electronic document; - in the form of an audio file; |
| With musculoskeletal apparatus disorders | - printed form; - in the form of an electronic document; |

This list can be specified depending on the students contingent.

12.5. Evaluation Fund for Intermediate Attestation discipline students.

12.5.1. List of evaluation funds correlated with the planned results of mastering the educational program.

For students with disabilities

| Categories of students | Types of evaluation tools | Forms of control and evaluation of learning outcomes |
|--|---|---|
| Hearing impaired | test | predominantly written verification |
| Visually impaired | interview | predominantly oral check (individually) |
| With disorders of the musculoskeletal system | solution of remote tests, control questions | organization of control in EIOS DSMU, written examination |

For students belonging to the category of disabled people and persons with disabilities, the time for preparing answers for the test is increased, it is allowed to prepare for the test using distance learning technologies.

12.5.2. Methodological materials that define the procedures for assessing knowledge, skills and (or) experience, characterizing the stages of formation competencies.

When carrying out the procedure for evaluating the learning outcomes of people with disabilities and persons with disabilities, the use of technical means necessary for them in connection with their

individual characteristics is envisaged.

The procedure for evaluating the learning outcomes of people with disabilities and people with disabilities in the discipline provides for the provision of information in forms adapted to the limitations of their health and perception of information:

For persons with visual impairments:

- in printed form in enlarged type;
- in the form of an electronic document;
- in the form of an audio file.

For people with hearing impairments:

- in printed form;
- in the form of an electronic document.

For people with musculoskeletal disorders:

- in printed form;
- in the form of an electronic document;
- in the form of an audio file.

This list can be specified depending on the contingent of students.

When carrying out the procedure for evaluating the learning outcomes of people with disabilities and people with disabilities in a discipline (module), the following additional requirements are met, depending on individual characteristics of students:

1. instructions on the procedure for conducting the assessment procedure are provided in an accessible form (orally, in writing, orally using the services of a sign language interpreter);
2. an accessible form for providing assignments of assessment tools (in printed form, in printed form in an enlarged font, in the form of an electronic document, assignments are read out by an assistant, assignments are provided using sign language translation);
3. an accessible form of providing answers to tasks (in writing on paper, a set of answers on a computer, using the services of an assistant, orally).

If necessary, for students with disabilities and the disabled, the procedure for evaluating learning outcomes in a discipline (module) can be carried out in several stages.

The procedure for evaluating the learning outcomes of people with disabilities and persons with disabilities is allowed using remote educational technologies.

12.6. The list of basic and additional educational literature necessary for the development of the discipline.

For mastering the discipline, disabled people and persons with disabilities are provided with basic and additional educational literature in the form of an electronic document in the library fund and / or in electronic library systems. Also, special textbooks and teaching aids, other educational literature and special technical training aids for collective and individual use, as well as the services of sign language and sign language interpreters are provided free of charge.

12.7. Guidelines for students on mastering the discipline

Individual work is of great importance in mastering the discipline by disabled people and persons with disabilities. Under individual work two forms of interaction with the teacher are implied: individual educational work (consultations), i.e. additional explanation of the educational material and in-depth study of the material with those students who are interested in this, and individual educational work. Individual consultations on the subject are an important factor contributing to the individualization of education and the establishment of educational contact between the teacher and the student with a disability or a student with disabilities.

