FEDERAL STATE BUDGETARY
EDUCATIONAL INSTITUTION OF HIGHER EDUCATION
"AMUR STATE MEDICAL ACADEMY"
MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION

AGREED
Vice-Rector for Academic Affairs,

_____ N.V. Loskutova
April 17, 2025

Decision of the CCMC
April 17, 2025
Protocol No. 7

APPROVED
by decision of the Academic Council of the FSBEI HE Amur SMA of the Ministry of Health of the Russian Federation
April 22, 2025
Protocol No. 5

Acting Rector of the FSBEI HE Amur SMA of the Ministry of Health of the Russian Federation

_____ I.V. Zhukovets
April 22, 2025

ДОКУМЕНТ ПОДПИСАН
ЭЛЕКТРОННОЙ ПОДПИСЬЮ

Сертификат: 50AB2429004E6452085E24FA420034A
Владелец: Жуковец Ирина Валентиновна
Действителен: с 15.04.2025 до 09.07.2026

EDUCATIONAL PROGRAM

discipline "Clinical Pharmacology"

Specialty: 31.05.01 General Medicine
Course: 6
Semester: 12
Total hours: 72 hrs.
Total credits: 2 credit units
Control form: credit-test, 12 semester

Blagoveshchensk, 2025

The educational program of the discipline is designed in accordance with the requirements of the Federal State Educational Standard of Higher Education - specialist in specialty 31.05.01 General Medicine, approved by the order of the Ministry of Education and Science of Russia dated 08.12.2020 No. 988 (registered with the Ministry of Justice of Russia on 08.26.2020 No. 59493), BPEP HE (2021).

Author: Associate Professor of the Department of Hospital Therapy with a Course in Pharmacology named after Professor Yu.S. Landyshev, Ph.D of Medical Sciences, I.V. Kostrova

Reviewers:
Chief specialist not on the staff , clinical pharmacologist of the Ministry of Health of the Amur Region, Ph.D. of Medical Sciences, M.V. Babich
Associate Professor at the Department of Internal Medicine of the Faculty of Postgraduate Education, Ph.D. of Medical Sciences V.V. Bataeva

APPROVED at the meeting of the Department of Hospital Therapy with a course in Pharmacology named after Professor Yu.S. Landyshev,
Protocol No. 8 dated April 16, 2025

Head of the Department of Hospital Therapy with a course in Pharmacology named after Professor Yu.S. Landyshev,
Holder of an Advanced Doctorate (Doctor of Science) in Medical Sciences,
Full Professor _____V.V. Voitsekhovsky

Conclusion of the Expert Commission on the review of the Educational Programs:
Protocol No. 1 dated April 16, 2025
Expert of the Expert Commission,
Holder of an Advanced Doctorate (Doctor of Science) in Medical Sciences,
Associate Professor _____E.E. Molchanova

APPROVED at the meeting of the CMC No.3:
Protocol No. 6 dated April 17, 2025
Chairman of the CMC No. 3
Holder of an Advanced Doctorate (Doctor of Science) in Medical Sciences,
Full Professor _____ V.V. Voitsekhovsky

AGREED:
Dean of the Faculty of Medicine,
Ph.D. of Medical Sciences, Associate Professor _____N.G. Brush

April 17, 2025

CONTENTS OF THE WORK PROGRAM

1. Explanatory note

1.1. Characteristics of the discipline

Clinical pharmacology is a science that studies the interaction of drugs with the body of a healthy and sick person, develops principles and methods for studying the action of pharmacological drugs in clinical conditions and is the scientific basis of pharmacotherapy. As a result of the creation of a large number of highly effective drugs, pharmacotherapy has become a universal method of treating most diseases. Knowledge of clinical pharmacology is absolutely necessary for a doctor due to the need to use the principles of effective and safe selection of drugs to ensure therapeutic, prophylactic and diagnostic processes in inpatient and outpatient settings.

Classes in the discipline "Clinical Pharmacology" are held in the 12th semester: 10 clinical practical classes and 14 hours of lectures.

1.2. The purpose and objectives of the discipline

The purpose of teaching the discipline isfdeveloping students' skills in selecting effective, safe medications and their dosage regimens based on clinical guidelines, diagnostic and treatment standards, formularies, a list of vital and essential medications for modern individualized, controlled pharmacotherapy, using basic data on pharmacokinetics, pharmacodynamics, pharmacogenetics, pharmacoeconomics, pharmacoepidemiology, drug interactions, taking into account the manifestations of adverse drug reactions, and the provisions of evidence-based medicine.

Learning objectives of the discipline:

- students' mastery of the main issues of general and specific clinical pharmacology based on modern achievements in the field of fundamental and clinical medicine from the standpoint of evidence-based medicine;
- developing students' knowledge and skills in the area of prescribing and rational use of medicines, which are necessary for the future professional activity of a doctor in the context of the requirements of modern medicine and the Priority National Project "Health", allowing for the implementation of individualized, controlled, safe and effective pharmacotherapy, organizing work with medicines and observing the rules for their storage;
- familiarizing students with measures on labor protection and safety, prevention of occupational diseases, monitoring compliance and ensuring environmental safety;
- study by students of the pharmacodynamics and pharmacokinetics of the main groups of drugs used for the prevention, diagnosis, treatment of the most common and socially significant human diseases, and in the rehabilitation of patients;
- study of drug interactions and adverse drug reactions on the body, indications and contraindications for the use of drugs;
- development of skills necessary for solving individual research and applied scientific problems in the field of clinical pharmacology using knowledge of the basic requirements of information security;
- developing students’ skills in communication and interaction with the team, partners, patients and their relatives.

1.3. The place of the discipline in the structure of the mainprofessional educational program of higher education

In accordance with the Federal State Educational Standard of Higher Education - specialist in specialty 31.05.01 General Medicine (2020), the discipline "Clinical Pharmacology" refers to the

basic part, Block I. The total workload is 2 credits (72 hours), taught in the 12th semester in the 6th year. The form of control is a credit in the 12th semester.

1.4. Requirements for students

To study the discipline, knowledge, skills and abilities formed by previous disciplines are necessary:
Latin
Knowledge: basic medical and pharmaceutical terminology in Latin.
Skills:be able to apply knowledge for communication and obtaining information from medical literature, medical documentation.
Skills:application of knowledge for communication and obtaining information from medical literature, medical documentation.
Professional foreign language
Knowledge: basic medical and pharmaceutical terminology in a foreign language.
Skills: apply knowledge to communicate and obtain information from foreign sources.
Skills:application of knowledge for communication and obtaining information from foreign sources.
History of Medicine
Knowledge:outstanding figures in medicine and health care, Nobel laureates, outstanding medical discoveries in the field of therapy, the influence of humanistic ideas on medicine.
Skills:competently and independently present and analyze the contribution of domestic scientists to the development of immunology.
Skills:competent and independent presentation and analysis of the contribution of domestic scientists to the development of immunology.
Philosophy
Knowledge:methods and techniques of philosophical analysis of problems; forms and methods of scientific knowledge, their evolution; basic patterns and trends in the development of the world historical process; laws of dialectical materialism in medicine.
Skills: to competently and independently express, analyze the forms and methods of scientific knowledge and the laws of dialectical materialism in medicine.
Skills:competent and independent presentation, analysis of the form and methods of scientific knowledge and the laws of dialectical materialism in medicine.
Bioethics
Knowledge:moral and ethical standards, rules and principles of professional medical conduct, the rights of the patient and the doctor, the main ethical documents regulating the activities of the doctor.
Skills:build and maintain working relationships with patients and other team members.
Skills:building and maintaining working relationships with patients and other team members.
Histology, embryology, cytology
Knowledge:embryogenesis, histological structure of tissues and systems.
Skills: determine age-related patterns of development of organs and systems; analyze the results of histophysiological research.
Skills:determination of age-related patterns of development of organs and systems, analysis of the results of histophysiological research.
Microbiology, virology
Knowledge:the impact of microbes, viruses, rickettsia, and fungi on the body. Microbiological diagnostics of infectious diseases.

Skills:analyze the results of microbiological diagnostics of infectious diseases.
Skills:analysis of the results of microbiological diagnostics of infectious diseases.
Physics, mathematics
Knowledge:mathematical methods for solving intellectual problems and their application in medicine; theoretical foundations of computer science, collection, storage, search, processing, transformation, distribution of information in medical and biological systems, use of information computer systems in medicine and health care; principles of operation and design of equipment used in medicine, principles of physical and mathematical laws reflected in medicine.
Skills:use educational, scientific, popular science literature, the Internet for professional activities, work with equipment taking into account safety regulations.
Skills:use of educational, scientific, popular science literature, the Internet for professional activities, work with equipment taking into account safety regulations.
Chemistry. Bioinorganic and biophysical chemistry in medicine.
Knowledge:the chemical and biological essence of the processes occurring in a living organism at the molecular and cellular levels.
Skills:analyze the contribution of chemical processes to the functioning of the cardiovascular, respiratory, digestive, urinary, and hematopoietic systems.
Skills:analysis of the contribution of chemical processes to the functioning of the cardiovascular, respiratory, digestive, urinary, and hematopoietic systems.
Bioorganic chemistry in medicine
Knowledge: blood composition, biochemical blood constants, hormones, buffer systems, hemoglobin oxygenation factors, erythrocyte metabolism.
Skills:analyze the contribution of biochemical processes to the functioning of organs and the cardiovascular, respiratory, digestive, urinary, and hematopoietic systems; interpret the results of the most common laboratory diagnostic methods to identify disorders in diseases of internal organs and occupational diseases.
Skills:analysis of the contribution of biochemical processes to the functioning of the cardiovascular, respiratory, digestive, urinary, and hematopoietic systems, interpretation of the results of the most common laboratory diagnostic methods to identify disorders in diseases of internal organs and occupational diseases.
Biology
Knowledge:laws of genetics and its importance for medicine; patterns of heredity and variability in individual development as the basis for understanding the pathogenesis and etiology of hereditary and multifactorial diseases; biosphere and ecology, the phenomenon of parasitism and bioecological diseases.
Skills:analyze the patterns of heredity and variability in the development of diseases of internal organs and occupational diseases.
Skills:analysis of patterns of heredity and variability in the development of diseases of internal organs and occupational diseases.
Anatomy
Knowledge:anatomical and physiological features of the respiratory, cardiovascular, digestive, and hematopoietic systems.
Skills:analyze age- and sex-related features of the structure of organs and systems.
Skills:analysis of age-gender characteristics of the structure of organs and systems.
Normal Physiology
Knowledge:reflex arc, conditioned and unconditioned reflexes, physiology of the cardiovascular, digestive, urinary, respiratory and hematopoietic systems in the norm.
Skills:analyze the importance of regulation of biological processes in the human body on the functioning of the cardiovascular, digestive, urinary, respiratory, and hematopoietic systems.
Skills:analysis of the importance of regulation of biological processes in the human body on the

functioning of the cardiovascular, digestive, urinary, respiratory, and hematopoietic systems.
Life safety
Knowledge:acute and chronic diseases caused by exposure to ionizing radiation (radiation sickness).
Skills:to analyze the importance of ionizing radiation on the formation of occupational pathology.
Skills:analysis of the importance of ionizing radiation in the formation of occupational pathology.
Pathophysiology, clinical pathophysiology
Knowledge:morphological changes in body tissues in pathologies of the cardiovascular, respiratory, digestive, urinary and blood systems.
Skills:determine the contribution of pathophysiological processes to the development of diseases of internal organs.
Skills:determination of the contribution of pathophysiological processes to the development of diseases of internal organs.
Immunology
Knowledge:types of immunity, regulation of the immune response, causes of immunopathological conditions, clinical manifestations of immunopathology, basic methods for assessing immune status and principles of its assessment, indications for the use of immunotropic therapy.
Skills:identify syndromes and symptoms of diseases associated with disorders of the immune system, prescribe a clinical and immunological examination, formulate an immunological diagnosis, prescribe immunocorrective therapy and preventive measures to prevent diseases of the immune system.
Skills:identification of syndromes and symptoms of diseases associated with disorders of the immune system, prescription of a clinical and immunological examination, formulation of an immunological diagnosis, prescription of immunocorrective therapy and preventive measures to prevent diseases of the immune system.
Pharmacology
Knowledge:pharmacokinetics, pharmacodynamics, side effects of various drugs on the body.
Skills:write out prescriptions for prescribed medications, know the indications and contraindications for their use.
Skills:writing prescriptions for prescribed drugs, knowledge of indications and contraindications for their use.
Propaedeutics of internal diseases
Knowledge:collection of complaints, anamnesis, objective methods of examination of patients (palpation, percussion, auscultation.
Skills:conduct an anamnestic and physical examination, identify the main syndromes and symptoms of diseases of internal organs.
Skills:conducting anamnestic and physical examination, identifying the main syndromes and symptoms of diseases of internal organs.
Public health and healthcare, health economics
Knowledge:fundamentals of the legislation of the Russian Federation on public health protection, main regulatory and technical documents; population health indicators, factors that shape human health (ecological, professional, natural and climatic, endemic, social, epidemiological, psycho-emotional, professional, genetic).
Skills:plan, analyze and evaluate the quality of medical care, the health status of the population and the impact of environmental and industrial factors on it; calculate medical statistics indicators.
Skills:planning, analysis and evaluation of the quality of medical care, the health status of the population and the impact of environmental and industrial factors on it; calculation of medical statistics indicators.
Pathological anatomy, clinical pathological anatomy
Knowledge:etiology, pathogenesis, morphogenesis, pathomorphosis of the disease, principles of classification of diseases; structural and functional bases of diseases and pathological processes;

causes, mechanisms of development and outcomes of typical pathological processes.
Skills:visually assess and record changes in the organs and tissues of the corpse, substantiate the nature of the pathological process and its clinical manifestations; provide a conclusion on the cause of death and formulate a pathological diagnosis.
Skills:visual assessment and recording of changes in the organs and tissues of a corpse, substantiation of the nature of the pathological process and its clinical manifestations; giving conclusions on the cause of death and formulating a pathological diagnosis.
Emergency conditions in the practice of a local therapist
Knowledge:etiology, pathogenesis, classification, clinical manifestations, complications, diagnosis, treatment and prevention of emergency conditions in therapy.
Skills:diagnose an urgent condition in the main therapeutic conditions, formulate and justify a clinical diagnosis, conduct differential diagnostics and provide emergency care.
Skills:diagnostics of urgent conditions in the main therapeutic conditions, formulation and justification of clinical diagnosis, conducting differential diagnostics and providing emergency care.
Faculty Therapy,
Knowledge:etiology, pathogenesis, classification, clinical manifestations, complications, diagnosis, treatment and prevention of major diseases of the respiratory, cardiovascular, digestive, urinary and hematopoietic systems and occupational diseases.
Skills:formulate and justify a clinical diagnosis, prescribe an examination and treatment plan for the main therapeutic diseases, diagnose an urgent condition and provide emergency care.
Skills:formulates and substantiates a clinical diagnosis, prescribes an examination and treatment plan for the main therapeutic diseases, diagnoses an urgent condition and provides emergency care.

1.5. Interdisciplinary links with subsequent disciplines

Item No.	Name of subsequent disciplines	Discipline "Clinical Pharmacology"
1	Hospital therapy	+
2	Outpatient therapy	+
3	Anesthesiology, resuscitation, intensive care	+
4	Differential diagnostics in cardiology	+

1.6. Requirements for the results of mastering the discipline

The process of studying the discipline "Clinical Pharmacology" is aimed at the formation of the following competencies: universal (UC), general professional (GPC) and professional (PK): UC-1, UC-3, GPC-1, GPC-4, GPC-7, GPC-11, PC-5, PC-6, PC-12, PC-14

No. p/p	Code and name of competence	Code and name of the indicator of achievement of competence	As a result of studying the academic discipline "Clinical Pharmacology", the student must:		
			Know	Be able to	To own
Universal competencies					
1	**UC-1.**Capable of carrying out a critical analysis of problematic situations based on a systems approach and developing an action strategy	**AI UC-1.1.**Analyzes a problem situation as a system, identifying its components and the connections between them. **AI UC-1.2.**Identifies gaps in information needed to resolve problem situations and designs processes to address them. **AI UC-1.3.**Applies systems analysis to resolve problematic situations in the professional sphere. **AI UC-1.4.**Uses logical and methodological tools for critical evaluation of modern concepts of a philosophical and social nature in his subject area. **AI UC-1.5.**Critically evaluates the reliability of information sources, works with conflicting information from different sources.	The main historical stages of clinical developmentpharmacology, subject and objectives of the discipline, connection with other medical-biological and medical disciplines; basic terms and concepts used in clinicalpharmacology; modern concepts in the study of clinicalpharmacology; principles of using logical and methodological tools for critical evaluation of modern concepts of a philosophical and social nature inclinicalpharmacology	Describe the stages of clinical developmentpharmacologyas a science and its role at the present stage;to assess the contribution of domestic scientists to the developmentclinicalpharmacology; develop and argue a strategy for solving problem situations based on a systemic and interdisciplinary approach inclinicalpharmacology	The ability to analyze the significance of clinicalpharmacologyat the present stage;systemic analysis of the obtained data for resolving problematic situations in the professional sphere; methods for developing and arguing strategies for resolving problematic situations based on a systemic and interdisciplinary approach in clinical practicepharmacology; a critical approach to the assessment and reliability of information sources, a methodology for working with contradictory information obtained from different sources
2	**UC-3.**Able to organize and manage the work of a team, developing a team strategy to achieve the set goal	**AI UC-3.1.** Establishes and develops professional contacts in accordance with the needs of joint activities, including the exchange of information and the development of a unified strategy; works in a team, is tolerant of social, ethnic, religious and cultural differences.	Basic principles of tolerant perception of social, ethnic, religious and cultural differences when working in a team; skills of effective and conflict-free communication in a team	Tolerantly perceive social, ethnic, religious and cultural differences when working in a team; effectively andcommunicate without conflict in a team, including developing a team strategy to achieve the set goal	The ability to develop a team strategy to achieve a set goal, including a professional one;effective andconflict-free communication in a team; tolerance for social, ethnic, religious and cultural differences
General professional competencies					
2	**GPC-1.**Able to implement moral	**AI GPC 1.1**. Carries out professional activities in accordance with ethical	Ethical and deontological aspects of the relationship	Conduct a physical examination of the patient taking into account	Have communication skills with the patient and relatives

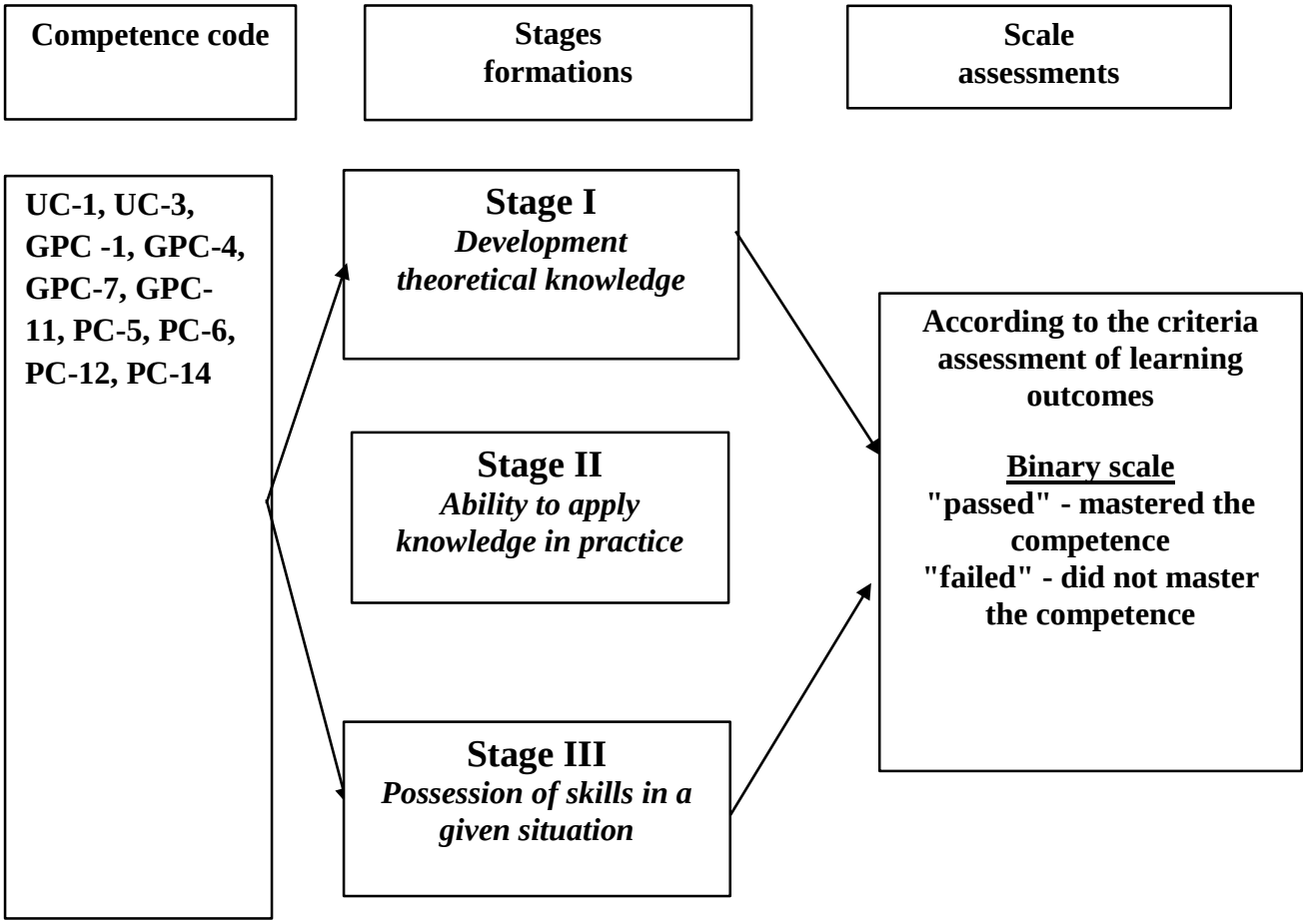
	and legal norms, ethical and deontological principles in professional activities	standards and moral principles. **AI GPC -1.2.**Organizes professional activities, guided by legislation in the field of healthcare, knowledge of medical ethics and deontology. **AI GPC -1.3.**Has the skills of presenting an independent point of view, analysis and logical thinking, public speaking, moral and ethical argumentation, conducting discussions and round tables, principles of medical deontology and medical ethics.	"doctor-doctor", "doctor-patient"; principles of effective and conflict-free communication with patients; methods of effective communication between doctor and patient in difficult situations; Basic requirements for the personality of a doctor; General principles for conducting discussions and round tables	ethical and deontological principles; communicate effectively and without conflict with patients, relatives, colleagues; to form effective relationships with the patient; to observe the principles of confidentiality; to conduct discussions, observing the principles of moral and ethical argumentation	colleagues, junior staff; identify problems with a patient's approach to a doctor; methods of verbal and non-verbal communication with the patient; principles of confidentiality in professional activities and communication with colleagues; continuous improvement of communication skills in the professional activities of a doctor
3	**GPC -4.**Capable of using medical devices provided for by the procedure for providing medical care, as well as conducting patient examinations to establish a diagnosis	**AI GPC -4.1.**Uses modern medical technologies, specialized equipment and medical products, disinfectants, drugs, including immunobiological and other substances and their combinations when solving professional problems from the standpoint of evidence-based medicine. **AI GPC -4.2.**Knows the indications and contraindications for the use of instrumental, functional and laboratory examination methods, possible complications during examination, emergency care and their prevention. **AI GPC -4.3.**Interprets the results of the most common methods of instrumental, laboratory and functional diagnostics, thermometry to identify pathological processes. **AI GPC -4.4.**Proficient in methods of general clinical examination of patients of various ages. **AI GPC -4.5.**Formulates a preliminary diagnosis and clinical diagnosis according to ICD.	Indications and contraindications for the use of modern medical technologies, medical devices, drugs, instrumental, functional and laboratory examination methods; interpretation of the results of the most common methods of instrumental, laboratory and functional diagnostics; methods of general clinical examination of the patient; principles of formulating a preliminary diagnosis and clinical diagnosis according to ICD	To apply modern medicines in accordance with the procedure for providing medical care from the standpoint of evidence-based medicine;	The ability to use modern medical technologies, specialized equipment, medical products, drugs and their combinations, from the standpoint of evidence-based medicine; compare the results of additional examination methods (instrumental, laboratory and functional diagnostics) to identify pathological processes; methods of general clinical examination of patients of different ages; formulation of a preliminary diagnosis and clinical diagnosis in accordance with the ICD, taking into account a set of clinical and additional examination methods (instrumental, laboratory and functional)
4	**GPC -7.**Able to prescribe treatment	**AI GPC -7.1.**Selects a drug based on the totality of its pharmacokinetic and	Principles of selectionmedicinal product	Make the optimal choicemedicinal product (taking	The ability to prescribe the optimal drug, select the preferred

	and monitor its effectiveness and safety	pharmacodynamic characteristics for the treatment of patients with various nosological forms in outpatient and inpatient settings. **AI GPC -7.2.**Selects the optimal minimum of the most effective means, using convenient methods of their application. **AI GPC -7.3.**Explains the main and side effects of drugs, the effects of their combined use and interaction with food, taking into account the morphofunctional characteristics, physiological states and pathological processes in the human body **AI GPC -7.5.**Takes into account morphofunctional features, physiological states and pathological processes in the human body when choosing over-the-counter drugs and other pharmacy products. **AI GPC -7.6.**Analyzes the results of possible drug interactions when using various drugs in combination. **AI GPC -7.7.**Assesses the effectiveness and safety of drug therapy using a combination of clinical, laboratory, instrumental and other diagnostic methods.	based on the totality of its pharmacokinetic and pharmacodynamic characteristics for the treatment of patients; advantages of the selected drug and the preferred method of its use; main and side effects of medicinal products; morphofunctional features, physiological states and pathological processes in the patient's body when choosing a medicinal product; results of possible interactions of medicinal products with the combined use of various drugs; criteria for the effectiveness and safety of drug therapy based on a totality of clinical, laboratory, instrumental and other diagnostic methods.	into account its pharmacokinetic and pharmacodynamic characteristics) and the preferred method of its use; identify the main and side effects of medicinal products, taking into account the morphofunctional characteristics, physiological states and pathological processes of the human body; select over-the-counter medications and other pharmacy products taking into account the physiological conditions and pathological processes of patients; take into account possible interaction of drugs with the combined use of various drugs; to evaluate the effectiveness and safety of drug therapy using a combination of clinical, laboratory, instrumental and other diagnostic methods.	method of its use, taking into accountmorphofunctional features, physiological conditions and pathological processes, possible interactions of drugs with the combined use of various drugs; ability to detect in a timely mannerside effects of medications; determination of the effectiveness and safety of drug therapy based on a combination of clinical, laboratory, instrumental and other diagnostic methods
5	**GPC -11.**Capable of preparing and applying scientific, scientific-production, design, organizational-managerial and regulatory documentation in the healthcare system	**AI GPC 11.1.**Applies modern methods of collecting and processing information, conducts statistical analysis of the data obtained in the professional field and interprets the results to solve professional problems. **AI GPC 11.2**. Identifies and analyzes problem situations, searches for and selects scientific, regulatory and organizational documentation in accordance with the specified goals. **AI GPC 11.3.**Interprets and applies data from physical, chemical, mathematical and other natural science concepts and methods to solve professional problems. **AI GPC -11.4.**Conducts scientific and	Basic methodological approaches to working with educational, scientific, reference, medical literature, including the Internet (methods of collecting and processing information); algorithms and software tools to support decision-making during the treatment and diagnostic process; methods of collecting, storing, searching, processing, transforming and distributing information in medical information systems;	Independently work with educational, scientific, reference, medical literature, including on the Internet (search and select information); carry out statistical processing, analysis of the obtained data and interpret the results to solve professional problems in the field of diagnostics and treatment; interprets and applies data from physical, chemical, mathematical and other natural science concepts and methods to solve professional problems.	The ability to take a systematic approach to the analysis of educational, scientific, reference, medical information, including Internet sources (methods of collecting and processing information); basic skills in using medical information systems and Internet resources; methods of maintaining medical records; the main scientific methods of cognition: observation, description, measurement, experiment; analysis and preparation of

		practical research, analyzes information using the historical method and prepares publications based on the research results. **AI GPC -11.5.**Analyzes and compiles accounting and reporting medical documentation and calculates qualitative and quantitative indicators used in professional activities.	methods of maintaining medical records; Basic statistical methods for solving intellectual problems and their application.		accounting and reporting medical documentation and methods for calculating qualitative and quantitative indicators.
Professional competencies					
6	**PC-5.**Capableprescribe treatment to patients	**AI PC-5.1.**Draws up a treatment plan for the patient taking into account the diagnosis, age of the patient, clinical picture of the disease, presence of complications, concomitant pathology, in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on issues of providing medical care, taking into account the standards of medical care **AI PC-5.2.**Prescribes medications, medical devices and therapeutic nutrition taking into account the diagnosis, age and clinical picture of the disease in accordance with the current procedures for the provision of medical care, clinical recommendations, taking into account the standards of medical care **AI PC-5.5.**Organizes personalized treatment for patients, including pregnant women, elderly and senile patients	Modern methods of application, mechanism of action, indications and contraindications for the prescription of drugs (taking into account the diagnosis, age and clinical picture of the disease) in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on issues of providing medical care, taking into account the standards of medical care; principles of organizing personalized treatment of patients, including pregnant women, elderly and senile patients	Make a treatment plan for the patient taking into account the diagnosis, age, and clinical picture of the diseasein accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on issues of providing medical care, taking into account the standards of medical care; prescribe medications; organize personalized treatment of the patient, including pregnant women, elderly and senile patients in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols)	The ability to develop an individual treatment plan for the patient, taking into account the diagnosis, age, and clinical picture of the diseasein accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on issues of providing medical care, taking into account the standards of medical care; organize personalized treatment of the patient, including pregnant women, elderly and senile patients in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on issues of providing medical care, taking into account the standards of medical care.
7	**PC-6.**Capable of monitoring the effectiveness and safety of the therapy being administered	**AI PC-6.1.**Assesses the effectiveness and safety of the use of drugs, medical devices, therapeutic nutrition and other treatment methods **AI PC-6.2.**Takes into account the pharmacodynamics and pharmacokinetics of the main groups of drugs, prevents the development of adverse drug reactions, and corrects them if they occur.	Information on the efficacy and safety of medicinal products; pharmacodynamics and pharmacokinetics of the main groups of medicinal products	Assess the efficacy and safety of patients' medications; take into account the pharmacodynamics and pharmacokinetics of medications when prescribing	Abilityto evaluate the effectiveness and safety of the use of drugs ability to take into account the pharmacodynamics and pharmacokinetics of drugs when prescribing

8	**PC-12.**Ready to maintain medical records, including in electronic form	**AI PC-12.1.**Fills out medical documentation, including in electronic form **AI PC-12.2.**Works with personal data of patients and information constituting a medical secret **AI PC-12.3.**Prepares documents when referring patients for hospitalization, consultation, spa treatment, medical and social examination	Rules for the preparation of medical documentation (including in electronic form) in medical organizations; principles of workwith personal data of patients and information constituting a medical secret	Fill out medical documentation (including in electronic form) in medical organizations; work withpersonal data of patients and information constituting a medical secret	Ability to fill out medical documentation (including in electronic form) in medical organizations; ability to work withpersonal data of patients and information constituting a medical secret;
9	**PC-14.**Capable of participating in research activities	**AI PC-14.1.**Participates in scientific research **AI PC-14.2.**Analyzes medical information based on evidence-based medicine **AI PC-14.3.**Introduces new methods and techniques into practical healthcare aimed at protecting the health of the adult population	Methodology for conducting scientific research;main directions of scientific research; principles and methods of conducting scientific research, medical statistics	To participate in scientific research, analyze medical information based on evidence-based medicine, and introduce new methods into practical work aimed at protecting the health of the adult population	Abilityparticipate in scientific research; the ability to analyze medical information based on evidence-based medicine and implement new methods in practical work aimed at protecting the health of the adult population

1.7. Estages of competence development and assessment scale



1.8. Forms of training organization and types of control

Form of organization of students' training	Brief description
Lectures	The lecture material contains key and most problematic issues of the discipline, which are most significant in the training of a specialist.
Clinical practical classes	They are intended for the analysis (reinforcement) of theoretical principles and monitoring their assimilation with subsequent application of the acquired knowledge during the study of the topic.
Interactive forms of education	– interactive survey, – performing creative tasks, – discussions, – testing in the Moodle system, - business game.
Participation in the department's research work, student circle and conferences	– preparation of oral presentations and poster reports for presentation at a student club or scientific conference; – writing theses and abstracts on the chosen scientific field; – preparing a literature review usingeducational, scientific, reference literature and Internet sources.
Types of control	**Brief description**

Current control	Incoming inspection Testing theoretical knowledge and practical skills developed during the study of previous disciplines. The entrance knowledge control includes: – testing in the Moodle system (test of knowledge input control), – solving situational problems and exercises. The results of the incoming inspection are systematized, analyzed and used by the teaching staff of the department to develop measures to improve and update the teaching methods of the discipline.
	Current control (initial, output) of knowledge includes: – checking the solution of situational problems and exercises completed independently (extracurricular independent work); – assessment of the assimilation of theoretical material (oral survey andcomputer testing); – testing in the Moodle system on all topics of the discipline (tests include questions of a theoretical and practical nature); – individual assignments (practical and theoretical) for each topic of the discipline being studied.
Intermediate certification	The midterm assessment is presented by a test at the end of the 12th semester. The test includes the following stages: – assessment of knowledge of theoretical material (oral survey and interview); – testing in the systemMoodle (midterm assessment test); – testing the acquisition of practical skills and abilities; – defense of "Analysis of pharmacotherapy of a supervised patient" – solving situational problems for each topic of the discipline studied.

Explanation. Students receive theoretical knowledge of the discipline at lectures, clinical practical classes, taking part in the research work of the department, patient rounds with the head of the department, professor, associate professors. During clinical practical classes, the material learned is consolidated and monitored. Interactive forms of training are used in the training process: business games, computer simulations, etc. Practical application of theoretical material in everyday work is logical in the process of cognition, helps to acquire practical skills and abilities. In the process of patient supervision, students consolidate and improve the basics of patient examination, the skills of interpreting the results of clinical, laboratory and instrumental examination, formulating a clinical diagnosis, prescribing an examination and treatment plan, medical deontology, and medical ethics.

Current controlconsists of an assessment of the theoretical knowledge and practical skills developed by students during the lesson and includes: entrance control (carried out during the first lesson, designed to determine the level of preparedness of students and consists of testing on previously completed disciplines);initial control (checking homework, testing, including computer testing, frontal survey (similar theoretical and test questions will be offered during the midterm assessment)); final control (solving situational problems; testing practical skills (interpretation of patient examination results, laboratory and instrumental examination methods, formulation and justification of a clinical diagnosis, differential diagnosis, drawing up an examination and treatment plan).

Interim assessmentincludes a test in the 12th semester and consists of an assessment of the theoretical knowledge and practical skills developed by students during the course, includes a final test control (in the Moodle system), defense of the "Analysis of the pharmacotherapy of a

supervised patient", testing of practical skills, an interview on questions for midterm certification, and solving a situational problem.

2. Structure and content of the discipline

2.1. Scope of the discipline and types of academic work

Types of educational work	Total hours	12th semester
Lectures	14	14
Clinical practical classes	34	34
Independent work of students	24	24
Total labor intensity in hours	72	72
Total workload in credit units	2	2

2.2. Thematic plan of lectures and their brief content

Item No.	Lecture topics	Codes of formed competencies	Labor intensity (hours)
1	**General issues of clinical pharmacology.** The lecture presents the basic concepts of clinical pharmacology: pharmacodynamics and pharmacokinetics of drugs. It examines types of pharmacotherapy, targets of drug action, mechanisms of action, selectivity of action, types of drug action, pharmacokinetic parameters (routes of administration, absorption, distribution, elimination of drugs, excretion, adverse side effects of drugs).	UC-1, UC-3, GPC-1, GPC -4, GPC -7, GPC -11, PC-5, PC-6, PC-12, PC-14	2
2	**Age and anatomical-physiological features of the use of drugs.** The lecture covers the basic requirements for drugs used in pediatrics (efficacy and safety, choice of dosage regimens and optimal routes of administration). It then covers the features of pharmacodynamics, pharmacokinetics, side effects, and drug interactions, taking into account the anatomical and physiological characteristics of the child's body. Attention is paid to the use of drugs during pregnancy and lactation. The issues of using the most frequently used groups of drugs in pediatrics are considered.	UC-1, UC-3, GPC-1, GPC -4, GPC -7, GPC -11, PC-5, PC-6, PC-12, PC-14	2
3	**Clinical pharmacology of non-steroidal and steroidal anti-inflammatory drugs.** The lecture covers classification, modern concepts of mechanisms of action, pharmacological effects, pharmacokinetic parameters, indications and contraindications for use, adverse drug reactions, and methods for their elimination. Particular attention is paid to the rules of use and dosage, methods for improving the tolerability of NSAIDs, SPVS, and control measures during long-term use.	UC-1, UC-3, GPC-1, GPC -4, GPC -7, GPC -11, PC-5, PC-6, PC-12, PC-14	2
4	**Clinical pharmacology of antibacterial drugs.** The lecture covers the modern classification of antibacterial drugs, including by mechanism of action, principles of antibacterial therapy: selection of drugs taking into account the pathogen, clinical picture, patient's age, epidemiological situation, previous treatment and other factors; dosage, routes of administration, duration of treatment. The features of the pharmacokinetics of antibacterial drugs, issues of preventing the development of resistance in microorganisms are considered. The concept of step therapy, its advantages and limitations is given. Then the clinical and pharmacological characteristics of the main groups, features of prescription for bacterial infections are covered.	UC-1, UC-3, GPC-1, GPC -4, GPC -7, GPC -11, PC-5, PC-6, PC-12, PC-14	2
5	**Medicines used in the treatment of bronchial obstruction syndrome.**	UC-1, UC-3, GPC-1, GPC -4,	2

	The lecture covers the main modern principles of rational pharmacotherapy of diseases based on bronchial obstruction syndrome. When considering the main groups of drugs, the classification, pharmacodynamics, pharmacokinetics, basic principles of use, including dosage, contraindications, side effects and measures to eliminate them are presented. Then the principles of combined use of essential drugs are considered. The routes of drug delivery to the body are considered, taking into account childhood.	GPC -7, GPC -11, PC-5, PC-6, PC-12, PC-14	
6	**Medicines used in the treatment of the gastrointestinal tract.** The lecture covers the main modern principles of rational pharmacotherapy of gastrointestinal tract diseases: gastric ulcer and duodenal ulcer, chronic pancreatitis, chronic cholecystitis, inflammatory bowel diseases, hepatitis and liver cirrhosis. When considering the main groups of drugs, the classification, pharmacodynamics, pharmacokinetics, basic principles of use, including dosage, contraindications, side effects and measures to eliminate them, taking into account childhood, are presented.	UC-1, UC-3, GPC-1, GPC -4, GPC -7, GPC -11, PC-5, PC-6, PC-12, PC-14	2
7	**Pharmacotherapy of arterial hypertension.** The lecture covers the main modern principles of rational pharmacotherapy of arterial hypertension, based on the principles of evidence-based medicine. The goals of treatment of hypertension are defined. When considering groups of drugs, the classification, pharmacodynamics, pharmacokinetics, main principles of application, including dosage, contraindications, side effects and measures to eliminate them are presented. Then the principles of combined use of the main means for the treatment of hypertension are considered.	UC-1, UC-3, GPC-1, GPC -4, GPC -7, GPC -11, PC-5, PC-6, PC-12, PC-14	2
	Total hours		14

2.3.Thematic plan of clinical practical classes and their content

Topic No. p/p	**Name of topics of clinical practical classes**	**Contents of clinical practical classes**	**Codes of formed competencies and indicators of their achievement**	**Forms of control**	**Labor intensity (hours)**
XII semester					

1	General issues of clinical pharmacology. Basic principles of pharmacodynamics, pharmacokinetics, pharmacogenetics, interactions and side effects of drugs.	*Theoretical part*: Structure, purpose and tasks of clinical pharmacology. Basic principles of pharmacodynamics: mechanism of action, specificity and selectivity of action. Basic parameters of pharmacokinetics: features of drug intake depending on the route of administration, absorption and bioavailability, binding to plasma proteins, distribution and elimination of drugs and their metabolites from the body. Dosage regimens. Interaction of drugs: pharmacodynamic, pharmacokinetic, pharmaceutical, pharmacogenetic, physiological. Adverse effects of drugs, predictable and unpredictable. Methods for preventing and correcting side effects of drugs. Methods for assessing the efficacy and safety of drugs. Features of clinical pharmacology in pregnant women, fetus, newborn, children, elderly and senile people. Pharmacogenetics and biorhythms. *Practical part*: analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct a drug test. 2. Develop a protocol for studying a medicinal product. 3. Conduct an analysis of the pharmacotherapy of the supervised patient: select basic therapy for the underlying disease, establish principles for dosing medications, select methods for monitoring the effectiveness and safety of their use. 4. Predict the possibility of developing tachyphylaxis, withdrawal syndromes, and theft. 5. Provide assistance in case of development of tachyphylaxis, withdrawal syndromes, and theft. 6. Select a combination of drugs to eliminate unwanted interactions	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3. AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2.	- checking homework - frontal survey (oral or written) - testing, including computer testing - solving situational problems - testing practical skills	3.4

			PC-12. AI PC-12.1. AI PC-12.2. AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3.		
2	Clinical pharmacology of anti-inflammatory drugs (NSAIDs, NSAIDs).	*Theoretical part:*Clinical criteria and signs of inflammation, age aspect. Main nosological entities requiring the use of basic therapy with NSAIDs, SPVS. Classification of anti-inflammatory drugs. Algorithm for choosing basic therapy for different nosologies, variants, stages of the disease and degree of activity. Pharmacodynamics of the main groups of anti-inflammatory drugs. Dosage regimens (for SPVS: pulse therapy, alternating, intermittent, course, maintenance therapy) and routes of rational administration taking into account the features of pharmacodynamics, pharmacokinetics of drugs. Interaction of anti-inflammatory drugs: NSAIDs, SPVS both with each other and with drugs of other groups. Side effects of anti-inflammatory drugs. The degree of risk of the drugs used taking into account age. When considering the issues of the lesson, special attention is paid to the features of the use of drugs in pediatric practice. *Practical part*: analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct drug tests with NSAIDs, SPVS; 2. Conduct an analysis of pharmacotherapy in a supervised patient receiving anti-inflammatory therapy, establish principles for dosing drugs, select methods for monitoring	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3. AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4.	- checking homework - frontal survey (oral or written) - testing, including computer testing - solving situational problems - testing practical skills	3.4

		the effectiveness and safety of their use; 3. Predict the possibility of developing side effects of NSAIDs, SSAIDs, be able to prevent them, and if they develop, stop them; 4. Prevent the development of withdrawal syndrome during long-term use of SSARS; 5. Make a choice of combination therapy in order to exclude unwanted interactions of drugs.	AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2. AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3.		
3	Clinical pharmacology of slow-acting anti-inflammatory drugs: immunosuppressants, cytostatics and immunomodulators	*Theoretical part*: Etiology, pathogenesis of diseases based on immunological mechanisms. Classification of cytostatics, immunosuppressants, immunomodulators. Algorithm for choosing basic therapy. Pharmacodynamics of the main groups of drugs on the topic. Pharmacokinetics of the main groups of drugs on the topic. Dosage regimens and routes of administration of cytostatics, immunosuppressants, immunomodulators depending on the individual characteristics of the patient's body. Interaction between the main groups of drugs. Side effects of cytostatics, immunosuppressants, immunomodulators. When considering the questions of the lesson, special attention is paid to the features of the use of drugs in pediatric practice. *Practical part:*analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to:	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3. AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2.	- checking homework - frontal survey (oral or written) - testing, including computer testing - solving situational problems - testing practical skills	3.4

		1. Conducting drug tests of slow-acting anti-inflammatory drugs with various groups of drugs 2. Conduct an analysis of the pharmacotherapy of the supervised patient, establish the principles and methods of drug dosing, select methods for monitoring their effectiveness and safety. 3. Predict the possibility of developing side effects of slow-acting anti-inflammatory drugs. 4. Select combination therapy in order to eliminate unwanted interactions between different groups of drugs.	AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2. AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3.		
4	Clinical pharmacology of drugs affecting vascular tone. Clinical pharmacology of lipid-lowering agents.	*Theoretical part:*Classification of drugs affecting vascular tone, lipid-lowering agents. Pharmacodynamics of the main groups of drugs on the topic of the lesson. Pharmacokinetics of the main groups of drugs on the topic of the lesson. Indications for use. Principles of drug selection, determination of routes of administration, rational dosing regimen depending on the individual characteristics of the patient's body. Possible interactions with combined administration. Possible side effects of drugs affecting vascular tone, lipid-lowering drugs, diagnostics, correction and prevention of ADRs. Methods for assessing efficacy and	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3. AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3.	- checking homework - frontal survey (oral or written) - testing, including computer testing - solving situational problems - testing practical skills	3.4

		safety. When considering the issues of the lesson, special attention is paid to the features of drug use in pediatric practice. *Practical part*: analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct drug tests with drugs that affect vascular tone and lipid-lowering agents. 2. Conduct an analysis of the pharmacotherapy of the supervised patient, establish the principles and methods of dosing drugs used in the complex treatment of cardiovascular pathology, select methods for monitoring their effectiveness and safety. 3. Predict the possibility of developing side effects during treatment with drugs that affect vascular tone and lipid-lowering agents. 4. Predict withdrawal syndrome. 5. Select combination therapy to avoid unwanted interactions between drugs.	**OPK-4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **OPK-7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **OPK-11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2. AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3.		
5	Clinical pharmacology of drugs affecting the	*Theoretical part*: Etiology, pathogenesis, classification of cardiac rhythm disorders. Classification of antiarrhythmic drugs by groups: 1) membrane stabilizing (IA, IB, IC); 2) β-	**UC-1.** AI UC -1.1. AI UC -1.2.	- checking homework - frontal survey (oral or written)	3.4

	main functions of the myocardium (contractility, excitability, conduction). Inotropic drugs. Diuretics.	blockers; 3) drugs that increase the duration of the action potential; 4) calcium channel blockers. Algorithm for choosing basic therapy for various forms and types of rhythm disorders. Classification of drugs that affect the contractile function of the myocardium (cardiac glycosides and non-glycoside cardiotonics) and hemodynamics in general (diuretics). Pharmacodynamics, pharmacokinetics of drugs on the topic of the lesson. Dosage regimens and routes of administration of antiarrhythmic drugs, cardiac glycosides, diuretics depending on the individual characteristics of the patient's body. Interaction between classes of antiarrhythmic drugs, inotropic drugs, diuretics, as well as with other groups of drugs. Side effects, their diagnostics, correction and prevention. Methods of assessing effectiveness and safety. When considering the questions of the lesson, special attention is paid to the features of the use of drugs in pediatric practice. *Practical part*: analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct drug tests with drugs on the topic of the lesson. 2. Conduct an analysis of the pharmacotherapy of the supervised patient receiving antiarrhythmic, inotropic and diuretic drugs. Establish the principles and methods of dosing, select methods for monitoring the effectiveness and safety of therapy. 3. Predict and identify side effects of antiarrhythmic, inotropic and diuretic drugs in patients. 4. Predict and identify the accumulation of cardiac glycosides and antiarrhythmic drugs. 5. Be able to select combination therapy in order to eliminate undesirable interactions between different classes of	AI UC -1.3. AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2.	- testing, including computer testing - solving situational problems - testing practical skills	

		antiarrhythmic, inotropic and diuretic agents and other groups of drugs, increasing toxicity or decreasing their effectiveness.	AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3.		
6	Clinical pharmacology of drugs affecting hemostasis (anticoagulants, coagulants, fibrinolytics, antiplatelet agents).	*Theoretical part*: Physiology of hemostasis regulation (blood coagulation factors, coagulation phases). Diagnostic criteria for blood coagulation disorders. Classification of drugs affecting hemostasis. Algorithm for choosing basic therapy for various blood coagulation disorders (hemophilia, thrombocytopathy, thrombosis, hemorrhagic syndrome). Pharmacodynamics of drugs affecting hemostasis. Pharmacokinetics of drugs affecting hemostasis. Dosage regimens for the main groups of coagulants, anticoagulants, fibrinolytics and antiplatelet agents, taking into account their pharmacokinetics, pharmacodynamics, and individual characteristics of the patient's body. Interaction between the main groups of drugs regulating hemostasis and with other classes of drugs used in the patient's therapy. Side effects of drugs affecting hemostasis. When considering the issues of the lesson, special attention is paid to the features of drug use in pediatric practice. *Practical part*: analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct drug tests with different classes and groups of agents that regulate hemostasis. 2. Conduct an analysis of the pharmacotherapy of the supervised patient with a disorder of the blood coagulation system. Establish the principles and methods of dosing	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3. AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5.	- checking homework - frontal survey (oral or written) - testing, including computer testing - solving situational problems - testing practical skills	3.4

		drugs, select methods of monitoring their effectiveness and safety. 3. Predict and identify side effects of drugs that regulate hemostasis. 4. Be able to select combination therapy in order to eliminate undesirable interactions between different groups of drugs that regulate hemostasis	**PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2. AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3..		
7	Clinical pharmacology of drugs used to treat bronchial obstruction syndrome (BOS): bronchodilators, expectorants, mucolytics, cell membrane stabilizers, antihistamines, antitussives, hyposensitizing agents.	*Theoretical part*: Etiology, pathogenesis of bronchial asthma. Diagnostic criteria for bronchial asthma. Classification of drugs that affect bronchial tone, antihistamines, membrane stabilizing agents, expectorants and mucolytics. Algorithm for choosing basic therapy for various forms and variants of bronchial asthma, stepwise selection of basic therapy for bronchial asthma. Pharmacodynamics of bronchodilators (selective and non-selective adrenergic agonists, phosphodiesterase inhibitors, M-cholinergic receptor blockers), mucolytics and expectorants, antitussives, H1-histamine receptor blockers, mast cell membrane stabilizers, glucocorticosteroids. Pharmacokinetics of drugs used in bronchial asthma. Dosage regimens for essential drugs, taking into account pharmacokinetics and pharmacodynamics, individual characteristics of the patient's body. Interaction between the main groups of drugs used in the treatment of SBO and other classes of drugs used in the patient. Side effects of drugs regulating the function of the bronchopulmonary apparatus. When considering the questions of the lesson, special attention is paid to the	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3. AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3.	- checking homework - frontal survey (oral or written) - testing, including computer testing - solving situational problems - testing practical skills	3.4

		features of the use of drugs in pediatric practice. *Practical part:*analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct drug tests with various groups of drugs that regulate the function of the bronchopulmonary apparatus. 2. Conduct an analysis of pharmacotherapy of the supervised patient with SBO. 3. Establish principles and methods of drug dosing, select methods of monitoring their safety and effectiveness. 4. Predict and identify side effects of drugs that regulate the function of the bronchopulmonary system. 5. Be able to select combination therapy in order to eliminate unwanted interactions between different groups of drugs.	AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2. AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3.		
8	Clinical pharmacology of antibacterial agents	*Theoretical part:*Pathogens of human diseases (types of microorganisms, pathogenicity factors and protective factors of bacteria, features of infectious lesions of people with immunodeficiencies). Pathogenesis of infectious-toxic syndrome (sepsis, septic shock). Microbiological studies in the clinic, diagnostics of infectious lesions of patients. The state of normal human microflora. Classification of antimicrobial agents used to treat infectious diseases. Algorithm for selecting antimicrobial drugs for the treatment of infections: first-choice drugs, reserve drugs. Antibacterial activity of drugs. Mechanisms of antibacterial action: bacteriostatic, bactericidal. Spectrum of antimicrobial action.	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3. AI UC -1.4. AI UC -1.5. **UC-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.**	- checking homework - frontal survey (oral or written) - testing, including computer testing - solving situational problems - testing practical skills	3.4

		Pharmacokinetics of antimicrobial agents. Dosage regimens of the main antibacterial drugs, taking into account the individual characteristics of the patient's body, the prevalence of infectious lesions. Interaction, both between the main groups of drugs, and with other drugs used in the patient due to complications or concomitant diseases. Side effects of the main antibacterial agents. When considering the issues of the lesson, special attention is paid to the peculiarities of the use of drugs in pediatric practice. *Practical part*: analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct drug tests with antimicrobial agents using laboratory diagnostic methods (clinical blood test, bacterial culture, determination of microflora sensitivity to antibiotics). 2. Conduct an analysis of antibacterial therapy for supervised patients with various infectious diseases. 3. Predict and identify side effects when using antibacterial agents. 4. Be able to select combination therapy in order to eliminate or reduce unwanted interactions between groups of antimicrobial agents and other drugs.	AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2. AI PC-12.3. **PC-14.** AI PC-14.1. AI PC-14.2. AI PC-14.3.		
9	Clinical pharmacology of drugs affecting the motor-secretory	*Theoretical part*: Etiology, pathogenesis, leading syndromes of digestive system pathology. Clinical, laboratory and functional diagnostics of digestive system diseases. Classification of the main drugs regulating gastrointestinal	**UC-1.** AI UC -1.1. AI UC -1.2. AI UC -1.3.	- checking homework - frontal survey (oral or written)	3.4

	function of the digestive system.	function: histamine H2-receptor blockers, M-cholinergic receptor blockers, antacids, cytoprotectors, Na-K-ATPase inhibitors, enzyme and antienzyme drugs, drugs regulating gastrointestinal tone and motility, laxatives, choleretics and cholekinetics, hepatoprotectors. Pharmacodynamics of drugs affecting the motor-secretory function of the digestive system. Pharmacokinetics of drugs affecting the motor-secretory function of the digestive system. Dosage regimens of drugs taking into account their pharmacodynamic and pharmacokinetic characteristics, individual characteristics and age, as well as characteristics of the nosological form. Side effects and interactions of drugs affecting the motor-secretory function of the digestive system. When considering the questions of the lesson, special attention is paid to the features of the use of drugs in pediatric practice. *Practical part*: analysis of a thematic patient, supervision of patients, solving situational problems, designing a workbook, working with handouts, educational, scientific, medical and reference literature. After completing the practical lesson, the student should be able to: 1. Conduct drug tests with various agents that regulate the function of the gastrointestinal tract; 2. Conduct an analysis of pharmacotherapy in a supervised patient with gastrointestinal diseases, establish principles of drug dosing, select methods for monitoring their effectiveness and safety; 3. Predict the possibility of developing side effects of drugs that regulate the function of the gastrointestinal tract, and if they occur, stop them; 4. To select combination therapy in order to exclude undesirable drug interactions between different groups of drugs that affect the motor-secretory function of the gastrointestinal tract.	AI UC -1.4. AI UC -1.5. **UK-3.** AI UC -3.1. **GPC-1.** AI GPC -1.1. AI GPC -1.2. AI GPC -1.3. **GPC -4.** AI GPC -4.1. AI GPC -4.2. AI GPC -4.3. AI GPC -4.4. AI GPC -4.5. **GPC -7.** AI GPC -7.1. AI GPC -7.2. AI GPC -7.3. AI GPC -7.5. AI GPC -7.6. AI GPC -7.7. **GPC -11.** AI GPC -11.1. AI GPC -11.2. AI GPC -11.3. AI GPC -11.4. AI GPC -11.5. **PC-5.** AI PC-5.1. AI PC-5.2. AI PC-5.5. **PC-6.** AI PC-6.1. AI PC-6.2. **PC-12.** AI PC-12.1. AI PC-12.2. AI PC-12.3.	- testing, including computer testing - solving situational problems - testing practical skills	

			PC-14. AI PC-14.1. AI PC-14.2. AI PC-14.3		
10	Interim assessment. Credit.	*Objective of the lesson*: To assess the final level of students' knowledge usingtest control, solving multi-stage situational problems, oral questioning, evaluation of the "Analysis of the pharmacotherapy of the supervised patient", dosage regimens and the adequacy of the selected methods for assessing the effectiveness and safety of drugs	**UC-1, UC-3, GPC -1, GPC -4, GPC -7, GPC -11, PC-5,PC-6, PC-12, PC-14.**	Testing in the Moodle system; interview on theoretical questions for intermediate knowledge control; situational task interview; testing practical skills; defense of "Analysis of pharmacotherapy of a supervised patient"	3.4
Total hours					34

2.4.Interactive forms of conducting classes

In order to activate students' cognitive activity, interactive teaching methods (business games, interactive surveys, etc.) are widely used in clinical practical classes.

Item No.	Topic of clinical practical lesson	Labor intensity in hours	Interactive form of learning	Labor intensity in hours, in % of the lesson
XII semester				
1	General issues of clinical pharmacology. Basic principles of pharmacodynamics, pharmacokinetics, pharmacogenetics, interactions and side effects of drugs.	3.4	Carrying out creative tasks, testing in the Moodle system	30 min. (0.5 hours)/14.7%
2	Clinical pharmacology of anti-inflammatory drugs (NSAIDs, NSAIDs).	3.4	Interactive survey, testing in the Moodle system	30 min. (0.5 hours)/14.7%
3	Clinical pharmacology of slow-acting anti-inflammatory drugs: immunosuppressants, cytostatics and immunomodulators	3.4	Interactive survey, testing in the Moodle system	30 min. (0.5 hours)/14.7%
4	Clinical pharmacology of drugs affecting vascular tone. Clinical pharmacology of lipid-lowering agents.	3.4	Interactive survey, testing in the Moodle system	30 min. (0.5 hours)/14.7%
5	Clinical pharmacology of drugs affecting the main functions of the myocardium (contractility, excitability, conduction). Inotropic drugs. Diuretics.	3.4	Interactive survey, testing in the Moodle system	30 min. (0.5 hours)/14.7%
6	Clinical pharmacology of drugs affecting hemostasis (anticoagulants, coagulants, fibrinolytics, antiplatelet agents).	3.4	Interactive survey, testing in the Moodle system	30 min. (0.5 hours)/14.7%
7	Clinical pharmacology of drugs used to treat bronchial obstruction syndrome (BOS): bronchodilators, expectorants, mucolytics, cell membrane stabilizers, antihistamines, antitussives, hyposensitizing agents.	3.4	Business game, testing in the Moodle system	30 min. (0.5 hours)/14.7%
8	Clinical pharmacology of antibacterial agents	3.4	Discussion, testing in the Moodle system	30 min. (0.5 hours)/14.7%
9	Clinical pharmacology of drugs affecting the motor-secretory function of the digestive system.	3.4	Interactive survey, testing in the Moodle system	30 min. (0.5 hours)/14.7%
10	Interim assessment. Credit.	3.4	Interactive survey, testing in the Moodle system	30 min. (0.5 hours)/14.7%

2.5. Evaluation criteriastudents' knowledge

The assessment of learning outcomes is carried out in accordance with the "Regulations on the assessment system for the learning outcomes of students of the Federal State Budgetary Educational Institution of Higher Education Amur State Medical Academy of the Ministry of Health of Russia".

The basis for determining the level of knowledge, skills, and abilities are the assessment criteria - completeness and correctness:

- correct, precise answer;

- correct, but incomplete or inaccurate answer;
- incorrect answer;
- no answer.

When assigning marks, the classification of errors and their quality are taken into account:
- gross errors;
- similar errors;
- minor errors;
- shortcomings.

Distribution of marks in clinical practical classes
XII semester

No. p/p	Topic of clinical practical lesson	Theoretical czech Part	Practical Part	Overall rating	Forms of control
1.	General issues of clinical pharmacology. Basic principles of pharmacodynamics, pharmacokinetics, pharmacogenetics, interactions and side effects of drugs.	2-5	2-5	2-5	**Theoretical part** Oral or written survey Test assignments, including computer ones **Practical part** Case study interview, testing practical skills at the patient's bedside, in the Accreditation and Simulation Center, preparation of the "Analysis of Pharmacotherapy of the Supervised Patient" and the ability to work with regulatory documents Performing exercises according to the model
2.	Clinical pharmacology of anti-inflammatory drugs (NSAIDs, NSAIDs).	2-5	2-5	2-5	
3.	Clinical pharmacology of slow-acting anti-inflammatory drugs: immunosuppressants, cytostatics and immunomodulators	2-5	2-5	2-5	
4.	Clinical pharmacology of drugs affecting vascular tone. Clinical pharmacology of lipid-lowering agents.	2-5	2-5	2-5	
5	Clinical pharmacology of drugs affecting the main functions of the myocardium (contractility, excitability, conduction). Inotropic drugs. Diuretics.	2-5	2-5	2-5	
6	Clinical pharmacology of drugs affecting hemostasis (anticoagulants, coagulants, fibrinolytics, antiplatelet agents).	2-5	2-5	2-5	
7	Clinical pharmacology of drugs used to treat bronchial obstruction syndrome (BOS): bronchodilators, expectorants, mucolytics, cell membrane stabilizers, antihistamines, antitussives, hyposensitizing agents.	2-5	2-5	2-5	
8	Clinical pharmacology of antibacterial agents	2-5	2-5	2-5	
9	Clinical pharmacology of drugs affecting the motor-secretory function of the digestive system.	2-5	2-5	2-5	
10	Interim assessment. Credit.	2-5	2-5	2-5	
Defense of "Analysis of Pharmacotherapy of a Supervised Patient"				2-5	
Average score					

Rating scales for ongoing knowledge control

The success of students in mastering the discipline (topics/sections), practical skills and abilities is characterized by a qualitative assessment and is assessed on a 5-point system: “5” - excellent, “4” - good, “3” - satisfactory, “2” - unsatisfactory.

Evaluation criteria

Success rate	Mark on a 5-point scale
90 - 100%	"5"
80 - 89%	"4"
70 - 79%	"3"
less than 70%	"2"

Incoming inspection

Conducted during the first lesson, includes testing in the Moodle system.
Access mode:https://educ-amursma.ru/mod/quiz/view.php?id=15120
The test control includes questions on the subjects studied in previous courses.

Current control

Current control includes initial and final control of knowledge.
Initial control is carried out by the teacher at the beginning of each lesson in the form of a frontal survey and solution of situational problems.
Final control – includes control over the methodology for performing practical skills and drawing up a protocol, testing in the Moodle system.
Access mode: https://educ-amursma.ru/course/view.php?id=638
The final grade during the current knowledge assessment is given on the day of the lesson, as the arithmetic mean result for all types of activities provided for in the given lesson of the discipline's work program.

Assessment criteria (grades) of the theoretical part

"5" -for the depth and completeness of mastery of the content of the educational material, in which the student easily navigates, for the ability to connect theoretical questions with practical ones, to express and justify their judgments, to correctly and logically present the answer; when testing, allows up to 10% of erroneous answers.
"4" -the student has fully mastered the educational material, is familiar with it, and correctly states the answer, but the content and form have some inaccuracies; when tested, allows up to 20% of incorrect answers.
"3"- the student has mastered the knowledge and understanding of the main provisions of the educational material, but presents it incompletely, inconsistently, does not know how to express and justify his judgments; when testing, allows up to 30% of erroneous answers.
"2"- the student has fragmented and unsystematic knowledge of the educational material, does not know how to distinguish between the main and the secondary, makes mistakes in defining concepts, distorts their meaning, presents the material in a disorderly and uncertain manner,When tested, it allows more than 30% of incorrect answers.

Assessment criteria for the practical part

"5" -the student supervises a subject patient on a daily basis, has fully mastered the practical skills and abilities provided for by the work program of the discipline (correctly interprets the patient's complaints, anamnesis, objective examination data, formulates a clinical diagnosis, prescribes examination and treatment, interprets clinical laboratory and instrumental indicators taking into account the norm).

"4" -the student supervises a subject patient on a daily basis, has fully mastered the practical skills and abilities provided for by the course work program, but allows for some inaccuracies.
"3" -the student does not regularly supervise the patient, the student has only some practical skills and abilities.
"2"-the student has visited the supervised patient less than 4 times, and performs practical skills and abilities with gross errors.

Evaluation criteria for the "Analysis of pharmacotherapy of the supervised patient":

5 points-the preparation of the "Analysis of the pharmacotherapy of the supervised patient" in accordance with the requirements, a competent, well-founded conclusion was given.

4 points-in the "Analysis of the pharmacotherapy of the supervised patient", the student makes inaccuracies in the formulation and justification of the detailed clinical diagnosis; the conclusion with recommendations for correcting the therapy is not sufficiently substantiated.

3 points-"Analysis of the pharmacotherapy of the supervised patient" is formatted with errors, inaccuracies were made in the wording, justification of the detailed clinical diagnosis, the treatment being carried out was not analyzed fully enough, recommendations for correction were given without taking into account concomitant pathology.

0 points-"Analysis of pharmacotherapy of a supervised patient" with gross errors (incorrectly established, detailed clinical diagnosis not substantiated, pharmacotherapy analysis not performed).

Working off disciplinary debts

If a student misses a class for a valid reason, he/she has the right to make it up and receive the maximum grade provided for by the course work program for that class. A valid reason must be documented.

If a student misses a class for an unjustified reason or receives a grade of "2" for all activities in the class, he is required to make it up.

If a student is excused from a class at the request of the dean's office (participation in sports, cultural and other events), then he is given a grade of "5" for this class, provided that he submits a report on the completion of mandatory extracurricular independent work on the topic of the missed class.

Assessment criteria for midterm assessment

Interim certification is carried out in 5 stages:

1. testing in the Moodle system.
Access mode: https://educ-amursma.ru/course/view.php?id=638
2. interview on theoretical questions for intermediate knowledge control;
3. situational task interview;
4. testing practical skills;
5. defense of "Analysis of pharmacotherapy of a supervised patient"

The conversion of the mark into a binary scale is carried out according to the following scheme:

Mark on a 5-point scale	**Rating on a binary scale**
"5"	passed
"4"	
"3"	
"2"	not credited

"Passed" -the student has fully mastered the educational material, is oriented in it, correctly states the answer, and allows up to 30% of incorrect answers during testing. Has practical skills and abilities provided for by the working program of the discipline.

"Not accepted"- the student has fragmented and unsystematic knowledge of the educational material, does not know how to distinguish between the main and the secondary, makes mistakes in

defining concepts, distorts their meaning, presents the material in a disorderly and uncertain manner,When tested, he makes more than 30% of wrong answers. He performs practical skills and abilities with gross errors.

2.6. Independent work of students: in-class and out-of-class

Independent work of students consists of two components: classroom and extracurricular (mandatory for all students and optional) work.

Independent classroom work of students.

The students' independent classroom work consists of25% of the time,allocated for the lesson. Classroom work includes: the main didactic tasks of independent work of students under the guidance of the teacher: consolidation of knowledge and skills acquired during the study of the academic discipline in lectures and practical classes; prevention of their forgetting; expansion and deepening of the educational material; formation of the ability and skills of independent work; development of independent thinking and creative abilities of students.

Students' classroom work includes:performing test control, solving multi-stage situational problems, working with case histories and prescription sheets of real patients, micro-curation of patients on the topic of the lesson, drawing up an algorithm for pharmacotherapy, working with informational reference literature on the clinical pharmacology of drugs.

Extracurricular independent work of students.

The following can be used as the main forms of extracurricular independent work: studying the main and additional educational and scientific literature; solving situational problems, test assignments, working in an online classroom; preparing oral reports; drawing up an algorithm for pharmacotherapy of the supervised patient, monitoring and self-monitoring specific clinical phenomena being studied, etc. This type of educational activity should be based on the activity, initiative, consciousness and self-activity of students.

Item No.	Topic of clinical practical lesson	Time for student preparation for the lesson	Forms of extracurricular independent work of a student	
			Mandatory and the same for all students	At the student's choice
1	General issues of clinical pharmacology. Basic principles of pharmacodynamics, pharmacokinetics, pharmacogenetics, interactions and side effects of drugs.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
2..	Clinical pharmacology of anti-inflammatory drugs (NSAIDs, NSAIDs).	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
3.	Clinical pharmacology of slow-acting anti-inflammatory drugs: immunosuppressants, cytostatics and immunomodulators.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs

4.	Clinical pharmacology of drugs affecting vascular tone. Clinical pharmacology of lipid-lowering agents.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
5.	Clinical pharmacology of drugs affecting the main functions of the myocardium (automatism, excitability, conductivity). Diuretics.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
6.	Clinical pharmacology of drugs affecting hemostasis.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
7.	Clinical pharmacology of drugs used in the treatment of bronchial obstruction syndrome (BOS): bronchodilators, expectorants, membrane stabilizing agents, antihistamines, leukotriene synthesis inhibitors, glucocorticoids and mucolytics.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
8.	Clinical pharmacology of antibacterial agents.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
9.	Clinical pharmacology of drugs affecting the motor-secretory function of the digestive system.	2.4 hours	Solving situational problems, drawing up an algorithm for pharmacotherapy for a supervised patient, an abstract message with a review of periodicals	Computer presentation, production of a tablet, table, stand, thematic album on drugs
10	Credit lesson	2.4 hours		
Labor intensity in hours		16 hours	4 hours	4 hours
Total labor intensity (in hours)			24	

2.7. Research (project) work

Research (project) work of students (RWS) is a mandatory section of the discipline and is aimed at the comprehensive formation of universal, general professional and professional competencies of students. RWS involves the study of specialized literature and other scientific and technical information on the achievements of domestic and foreign science and technology in the relevant field of knowledge, participation in scientific research, etc. The topics of RWS can be chosen by students independently or in consultation with the teacher.

Sample topics for research (project) work students' work:

1. Features of treatment of allergic diseases.
2. Efficiency of using genetically engineered drugs in rheumatology.
3. Comparative effectiveness of combination drugs in pulmonology depending on the nosology.

4. Current issues in the diagnosis and treatment of bronchial asthma.
5. Current issues of diagnostics and treatment of arterial hypertension in the practice of a general practitioner.

Criteria for assessing students' research (project) work:

- the material on the results of the research in the report is presented in detail, the specialized literature is well-developed, scientific and technical information on the achievements of domestic and foreign science and technology in the relevant field of knowledge is studied - "passed".
- the material on the results of the research in the report is not presented accurately enough, the special literature is poorly studied, the scientific and technical information on the achievements of domestic and foreign science and technology in the relevant field of knowledge is not studied - "failed".

3. Educational, methodological, logistical and informational support of the discipline

3.1 Main literature

1. Kharkevitch D.A., Pharmacology / Kharkevitch D.A. - M. : ГЭОТАР-Медиа, 2017. - 680 с. - ISBN 978-5-9704-3883-1
Прототип **Электронное издание на основе**: Pharmacology: Textbook / Translation of Russian textbook, 12th edition, revised and improved. - M. : ГЭОТАР-Медиа, 2017. - 2nd edition. - 680 pages with illustrations. - **ISBN 978-5-9704-3883-1**.
http://www.studentlibrary.ru/book/ISBN9785970438831.html
2. Weber, V. R. Clinical pharmacology: textbook / V. R. Weber. - Moscow: GEOTAR-Media, 2023. - 784 p. - ISBN 978-5-9704-6909-5, DOI: 10.33029/9704-6909-5-KFU-2023-1-784. - Electronic version is available on the website of the electronic library system "Student Consultant": [site]. URL: https://www.studentlibrary.ru/book/ISBN9785970469095.html (date accessed: 01.11.2024). - Access mode: by subscription. - Text: electronic
3. Pharmacology: textbook / edited by R. N. Alyautdin. - 7th ed., revised and enlarged. - Moscow: GEOTAR-Media, 2023. - 1152 p. - ISBN 978-5-9704-7958-2, DOI: 10.33029/9704-7958-2-FARM-2023-1-1152. - Electronic version is available on the website of the Electronic Library System "Student Consultant": [site]. URL: https://www.studentlibrary.ru/book/ISBN9785970479582.html (date of access: 01.11.2024). - Access mode: by subscription. - Text: electronic
4. Kharkevich, D. A. Pharmacology: textbook / D. A. Kharkevich. - 13th ed., revised. - Moscow: GEOTAR-Media, 2022. - 752 p.: ill. - 752 p. - ISBN 978-5-9704-6820-3. - Text: electronic // Electronic Library System "Student Consultant": [site]. - URL: https://www.studentlibrary.ru/book/ISBN9785970468203.html (date accessed: 11/12/2024). - Access mode: by subscription.
5. Kukes, V. G. Clinical pharmacology: textbook / V. G. Kukes, D. A. Sychev [etc.]; edited by V. G. Kukesa, D. A. Sycheva. - 6th ed. , rev. and additional - Moscow: GEOTAR-Media, 2022. - 1024 p. : ill. - 1024 s. - ISBN 978-5-9704-6807-4. - Text: electronic // EBS "Student Consultant": [website]. - URL:

3.2 Further reading:

1. Samylina, I. A. Pharmacognosy: textbook / I. A. Samylina, G. P. Yakovlev - Moscow: GEOTAR-Media, 2025. - 976 p. - ISBN 978-5-9704-8849-2. - Text: electronic // EBS "Student Consultant": [site]. - URL: https://www.studentlibrary.ru/book/ISBN9785970488492.html (accessed: 08.11.2024). - Access mode: by subscription. Cardiology. National guidelines. Brief edition: practical guide / edited by E. V. Shlyakhto. - 2nd ed., revised. and additional - Moscow: GEOTAR-Media, 2023. - 816 p. - ISBN 978-5-9704-7537-9. - Text: electronic // Electronic Library System "Student Consultant": [site]. - URL:

https://www.studentlibrary.ru/book/ISBN9785970475379.html (accessed: 21.03.2023). - Access mode: by subscription.
2. Galustyan, A. N. General Pharmacology Issues: A Textbook / A. N. Galustyan, N. A. Kuritsyna, M. I. Airapetov. - St. Petersburg: SPbSPMU, 2021. - 68 p. - ISBN 978-5-907443-46-4. - Text: electronic // Lan: electronic library system. - URL: https://e.lanbook.com/book/255872 (accessed: 12/14/2022). - Access mode: for authorized users.
3. Konorev M.R. Clinical pharmacology, pharmacological therapy: a teaching aid / M.R. Konorev, O.P. Dorozhkina, O.V. Kurlyuk. - 2nd, trans. and add., specialty 33.05.01 "Pharmacy". - Vitebsk: VSMU, 2022. - 400 p. - ISBN 9789855801123. - Text: electronic // EBS "Bookap": [site]. - URL: https://www.books-up.ru/ru/book/klinicheskaya-farmakologiya-farmakologicheskaya-terapiya-15709477
Access mode: by subscription.

3.3. Educational and methodological materials prepared by the department.

1. Chernykh M.V., Landyshev Yu.S., Lysenko V.A., Orlova E.V. Formulary system of antimicrobial agents. Blagoveshchensk, 2002, 162 p.
2. Landyshev Yu.S., Chaplenko T.N. Clinical pharmacology of inhaled corticosteroids. Blagoveshchensk, 2003, 20 p.
3. Landyshev Yu.S., Chaplenko T.N., Goborov N.D. Anaphylactic shock. Blagoveshchensk, 2004, 16 p.

Landyshev Yu.S., Dorovskikh V.A., Chaplenko T.N. Drug allergy. St. Petersburg: Nordmedizdat, 2010, 192 p.

Educational visual aids:

List of albums, stands, tables, tablets, handouts used in training (prepared by the department staff)

Stands

1. General issues of clinical pharmacology.
2. Nonsteroidal anti-inflammatory drugs.
3. Treatment of bronchial obstruction syndrome.

Tables

1. Treatment regimen for chronic heart failure.
2. Drugs for the treatment of chronic heart failure.
3. Algorithm for drug therapy of stable angina.
4. Usual doses of antiarrhythmic drugs used to maintain sinus rhythm in patients with atrial fibrillation.
5. LS for monitoring heart rate in patients with persistent atrial fibrillation.
6. LS for monitoring the ventricular rate in patients with persistent atrial fibrillation.
7. Antiarrhythmic drugs.
8. Evidence-based medicine.
9. Antiarrhythmic therapy to maintain sinus rhythm.
10. Recommendations for dynamic monitoring of side effects during treatment with antirheumatic drugs.
11. Algorithm for choosing antibacterial therapy.
12. Antibacterial drugs.
13. Side effects of nonsteroidal anti-inflammatory drugs.
14. Pharmacotherapy of COPD.
15. Medicines acting on the gastrointestinal tract. Medicines affecting motility and secretion.
16. Recommended doses of drugs with proven efficacy for pharmacological cardioversion.
17. Classification of drugs for the treatment of arterial hypertension.
18. GINA. Step therapy of bronchial asthma.

19. GOLD recommendations for the treatment of COPD.
20. Treatment strategy for chronic heart failure.
21. Treatment of gastric ulcer and duodenal ulcer.
22. Classification of antiarrhythmic drugs.
23. Classification of cytostatic drugs.

Albums

1. Treatment of chronic obstructive pulmonary disease.
2. Treatment of arterial hypertension.
3. Clinical pharmacology of cytostatics and immunosuppressants.
4. Drug interactions.
5. Introduction to Clinical Pharmacology.
6. Osteoporosis. Etiology, clinical features, diagnostics, treatment.
7. Adverse drug reactions.

Handouts:spirograms, forms with clinical, biochemical blood tests, sputum, radiographs, peak flowmetry diary,demonstration drugs (medicinal products used in pulmonary and allergological medical practice, various means of delivering drugs to the respiratory tract),tasks, tests, archival medical records, albums on the topics being studied, standards for providing specialized care on the topics being studied,tablets for self-study of students.

Electronic teaching aids:
(posted on the website of the Federal State Budgetary Educational Institution of Higher Education Amur State Medical Academy.
Access mode: https://www.amursma.ru/zakrytaya-chast-sayta/6-kurs/).

3.4. Equipment used for the educational process

1	Classroom for lecture-type classes No. 2, Building No. 1, Federal State Budgetary Educational Institution of Higher Education, Altai State Medical Academy, 675006, Amur Region, Blagoveshchensk, Gorky St. 95.Laptop, video projector
2	Classroom 2 (according to Explication No. 154), area - 17.2 sq. m, for conducting clinical practical classes, group and individual consultations, ongoing monitoring and midterm certification: 675000, Amur region, Blagoveshchensk, Voronkova st. 26, Main building Lit. A48 floor, block B room No. 154 A classroom equipped with specialized furniture: teacher's desk - 1, study tables - 4, chairs - 12,educational board – 1, pulse oximeter-1, thematic stands-3.
3	Classroom 5 (according to explication No. 161), area – 19.2 sq. m, for conducting clinical practical classes, group and individual consultations, ongoing monitoring and midterm certification: 675000, Amur Region, Blagoveshchensk, Voronkova St. 26, main building Lit. A49 floor, block B room 161 A classroom equipped with specialized furniture: 1 teacher's desk, 3 study tables, 12 chairs, 1 blackboard, 2 thematic stands.

3.5. Professional databases, information and reference systems, electronic educational resources

Resource name	Resource Description	Access	Resource address
Electronic library systems			
"Student consultant. Electronic library of the medical university"	For students and teachers of medical and pharmaceutical universities. Provides access to electronic versions of textbooks, teaching aids and periodicals.	Remote access after registration under the university profile	https://www.studentlibrary.ru/
Reference and information system "MedBaseGeotar".	The reference and information system "MedBaseGeotar" is intended for practicing medical specialists, researchers, teachers, postgraduate students, residents, senior students, and healthcare managers for the rapid search, selection, and reading of medical literature necessary for work in a single data source.	Remote access after registration under the university profile	https://mbasegeotar.ru/pages/index.html
Electronic library system "Bookup"	Large medical library - information and educational platform for the joint use of electronic educational, educational and methodological publications of medical universities of Russia and the CIS countries	Remote access after registration under the university profile	https://www.books-up.ru/
EBS "Lan"	Network electronic library of medical universities - an electronic database of educational and scientific works on medical topics, created for the purpose of implementing network forms of professional educational programs, open access to educational materials for partner universities	Remote access after registration under the university profile	https://e.lanbook.com/
Scientific electronic library "CyberLeninka"	CyberLeninka is a scientific electronic library built on the paradigm of open science (Open Science), the main tasks of which are the popularization of science and scientific activity, public control of the quality of scientific publications, the development of interdisciplinary research, a modern institute of scientific review, increasing the citation of Russian science and building a knowledge infrastructure. Contains more than 2.3 million scientific articles.	free access	https://cyberleninka.ru/
Oxford Medicine Online	A collection of Oxford medical publications, bringing together over 350 titles into a single, cross-searchable resource. Publications include The Oxford Handbook of Clinical Medicine and The Oxford Textbook of Medicine, both of which are continually updated electronically.	free access	http://www.oxfordmedicine.com
Human Biology Knowledge Base	Reference information on physiology , cell biology , genetics , biochemistry , immunology , pathology . (Resource of the Institute of Molecular Genetics of the Russian Academy of Sciences .)	free access	http://humbio.ru/
Medical online library	Free reference books, encyclopedias, books, monographs, abstracts, English-language literature, tests.	free access	https://www.medlib.ru/library/library/books
Information systems			
Clinical Guidelines Rubricator	A resource of the Russian Ministry of Health that contains clinical recommendations developed and approved by medical professional non-profit organizations of the Russian Federation, as well as methodological guidelines, nomenclatures and other reference materials.	link to download the application	https://cr.minzdrav.gov.ru/#!/
Federal Electronic Medical Library (FEMB)	The Federal Electronic Medical Library is part of the unified state information system in the field of healthcare as a reference system . FEMB was created on the basis of the funds of the Central Scientific Medical Library named after I.M. Sechenov.	free access	https://femb.ru/
Russian Medical Association	Professional Internet resource. Objective: to promote effective professional activity of medical personnel. Contains the charter, personnel, structure, rules of entry,	free access	http://www.rmass.ru/

	information about the Russian Medical Union.		
Web-medicine	The site presents a catalog of professional medical resources, including links to the most authoritative subject sites, journals, societies, as well as useful documents and programs. The site is intended for doctors, students, employees of medical universities and scientific institutions.	free access	http: //webmed.irkutsk.ru/
Databases			
World Health Organization	The site contains news, statistics on countries that are members of the World Health Organization, fact sheets, reports, WHO publications and much more.	free access	http://www.who.int/ru/
Ministry of Science and Higher Education of the Russian Federation	The website of the Ministry of Science and Higher Education of the Russian Federation contains news, newsletters, reports, publications and much more	free access	http://www.minobrnauki.gov.ru
Ministry of Education of the Russian Federation	The website of the Ministry of Education of the Russian Federation contains news, newsletters, reports, publications and much more	free access	https://edu.gov.ru/
Federal portal "Russian education"	A single window for access to educational resources. This portal provides access to textbooks on all areas of medicine and health care.	free access	http: //www .edu.ru/
Polpred.com	Electronic library system Business media. Media Review	free access	https://polpred.com/news
Bibliographic databases			
Database "Russian Medicine"	It is created in the Central Scientific and Methodological Library and covers the entire collection, starting from 1988. The database contains bibliographic descriptions of articles from domestic journals and collections, dissertations and their abstracts, as well as domestic and foreign books, collections of institute proceedings, conference materials, etc. Thematically, the database covers all areas of medicine and related areas of biology, biophysics, biochemistry, psychology, etc.	free access	https://rucml.ru/
PubMed	A text database of medical and biological publications in English. The PubMed database is an electronic search engine with free access to 30 million publications from 4,800 indexed journals on medical topics. The database contains articles published from 1960 to the present day, including information from MEDLINE, PreMEDLINE, NLM. Each year, the portal is replenished with more than 500 thousand new works.	free access	https :// pubmed . ncbi . nlm . nih . gov /
eLIBRARY.RU	Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of more than 13 million scientific articles and publications. The eLIBRARY.RU platform provides electronic versions of more than 2,000 Russian scientific and technical journals, including more than 1,000 open access journals.	Full functionality of the site is available after registration	http://elibrary.ru/defaultx.asp
Electronic library of dissertations (RSL)	Currently, the Electronic Library of Dissertations of the Russian State Library contains more than 919,000 full texts of dissertations and abstracts.	free access	http://diss.rsl.ru/?menu=disscatalog/
Medline.ru	Medical and biological portal for specialists. Biomedical journal.	free access	https://journal.scbmt.ru/jour/index
Official Internet portal of legal information	The single official state information and legal resource in Russia	free access	http://pravo.gov.ru/

3.6. “Licensed and freely distributed software used in the educational process.”

List of software (commercial software products)

No. p/p	List of software (commercial software products)	Details of supporting documents
1.	MS Operating System Windows 7 Pro	License number 48381779
2.	MS Operating System Windows 10 Pro	CONTRACT No. UT-368 from 09.21.2021
3 .	MS Office	License number: 43234783, 67810502, 67580703, 64399692, 62795141, 61350919
4.	Kaspersky Endpoint Security for Business – Standard Russian Edition. 50-99 Node 1 year Educational Renewal License	Agreement No. 7 AA dated 02/07/2025
5.	1C Accounting and 1C Salary	LICENSE AGREEMENT 612/L dated 02.02.2022 (additional licenses)
6.	PROF University	LICENSE AGREEMENT No. KrTsB-004537 dated 12/19/2023
7.	1C: PROF Library	LICENSE AGREEMENT No. 2281 dated 11.11.2020
8.	Consultant Plus	Contract No. 41AA dated 12/27/2024
9.	Contour.Tolk	Agreement No. K213753/24 dated 13.08.2024
10.	E-learning environment 3KL (Russian Moodle)	Agreement No. 1362.5 dated November 20, 2024
11.	Astra Linux Common Edition	Agreement No. 142 A dated September 21, 2021
12.	Information system "Plans"	Agreement No. 2873-24 dated June 28, 2024
13.	1C: Document Management	Agreement No. 2191 dated 10/15/2020
14.	R7-Office	Agreement No. 2 KS dated 12/18/2020
15.	License "OS ROSA CHROME workstation"	Agreement No. 88A dated 08/22/2024
16.	Alt Virtualization Server 10 (for secondary specialized and higher professional education)	Agreement No. 14AK dated 09/27/2024
17.	Dr.Web Desktop Security Suite Comprehensive protection + Control Center for 12 months.	Agreement No. 8 dated October 21, 2024
18.	Software "Schedule for educational institutions"	Agreement No. 82A dated July 30, 2024

List of freely distributed software

No. p/p	List of freely distributed software	Links to license agreement
1.	Yandex Browser	Freely distributed License agreement for the use of Yandex Browser programs https://yandex.ru/legal/browser_agreement/
2.	Yandex.Telemost	Freely distributed License Agreement for the Use of Programs https://yandex.ru/legal/telemost_mobile_agreement/
3.	Dr.Web CureIt!	Freely distributed License Agreement: https://st.drweb.com/static/new-www/files/license_CureIt_ru.pdf
4.	OpenOffice	Freely distributed License: http://www.gnu.org/copyleft/lesser.html
5.	LibreOffice	Freely distributed License: https://ru.libreoffice.org/about-us/license/
6.	VK Calls	Freely distributed https://vk.com/license
7.	Kaspersky Free Antivirus	Freely distributed https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win2021/21.16.6.467/english-0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt

3.7. Resources of the information and telecommunications network "Internet"

- Replace the Amur State Medical Academy library e-mail address with https://amurgma.ru/obuchenie/biblioteki/biblioteka-amurskoy-gma/

- The e-mail address of the Electronic Library System "Student Consultant" should be replaced with https://www.studentlibrary.ru

4. ASSESSMENT TOOLS FUND

4.1. Test tasks for current control and midterm certification

4.1.1. Examples of test tasks for current control (input, initial, output) with answer standards

Entrance control for the discipline is carried out in the Moodle system, access mode:
https://educ-amursma.ru/mod/quiz/view.php?id=15120
total number of test tasks – 149.

Examples of entrance control test tasks (with standard answers)

Examples of test tasks in the Moodle system:
Please indicate one correct answer.

1. "TYPICAL PATHOLOGICAL PROCESS" - THIS
   1) This is a standard process formed in the course of evolution, containing protective and adaptive mechanisms, developing in response to the action of pathogenic factors (inadequate stimuli) and is essentially a sanogenetic mechanism
   2) this is an inadequate (quantitatively and qualitatively) response to a physiological stimulus or to the action of a non-physiological stimulus
   3) this is a long-term pathological process or recovery with a functional defect
   4) this is the response of the organism or its part to external or internal influences

2. THE REACTION OF AG-HZAT (IGE) ON THE SURFACE OF TARGET CELLS (MAST CELLS, BASOPHILS), ACCOMPANIED BY SUBSEQUENT ACTIVATION OF THESE CELLS AND THE RELEASE OF MEDIATORS, IS THE CENTRAL PATHOGENETIC LINK IN ALLERGY
   1) I – type
   2) II-type
   3) IV-type
   4) V-type

3. ACUTE INFLAMMATION IS CHARACTERISTIC OF THE FOLLOWING SEQUENCE OF PATHOPHYSIOLOGICAL PROCESSES
   1) alteration□activation of lysosomal enzymes, release of mediators and microcirculatory response□change in permeability, exudation and emigration, phagocytosis□proliferation and repair of the defect
   2) alteration□microcirculation disorder□proliferation
   3) alteration□emigration□microcirculation disorder□proliferation
   4) alteration□proliferation□microcirculation disorder□emigration

4. THE MAIN PATHOGENETIC LINK IN THE DEVELOPMENT OF THE FIRST STAGE OF DIC SYNDROME
   1) excessive entry of exogenous and endogenous procoagulants into the blood
   2) activation of fibrinolysis
   3) activation of the primary anticoagulant system
   4) thrombocytopenia

   Answer standards: always correct 1.

Examples of test tasks for initial and final control (with standard answers)
Initial, final control for the discipline is carried out in the Moodle system, access mode: https://educ-amursma.ru/course/view.php?id=638
The total number of test tasks is 100.
Examples of test tasks in the Moodle system:
Please indicate one correct answer.

1. THE HALF-LIFE OF DRUG IS
1) time to reach the maximum concentration of the drug in plasma
2) the time it takes for the drug to reach the systemic circulation
3) the time during which the drug is distributed in the body
4) the time it takes for the drug concentration in plasma to decrease by 50%

2. THE CONCEPT OF "PRESYSTEM METABOLISM" INCLUDES
1) biotransformation of drugs in the liver during the first pass and in the intestine
2) biotransformation of drugs in the intestine
3) biotransformation of drugs in the liver during the first pass and in the kidneys
4) biotransformation of drugs in the liver, kidneys and intestines

3. FACTOR DETERMINING THE NEED TO RECALCULATE THE DRUG ADMINISTRATION REGIMEN IN CRF
1) high lipophilicity of the drug
2) low binding to plasma proteins
3) the presence of active tubular excretion pathway systems
4) high degree of excretion unchanged

4. THE BREADTH OF THERAPEUTIC ACTION IS
1) therapeutic dose of the drug
2) the ratio of the concentration of a drug in an organ or tissue to its concentration in the blood plasma
3) the range between the minimum therapeutic and minimum toxic concentrations of the drug in plasma
4) percentage of drug not bound to protein

5. DRUGS THAT PASS THE BBB MORE EASILY
1) highly soluble in water
2) highly soluble in fats
3) exhibiting properties of weak acids
4) with weak binding to plasma proteins

6. FEATURES OF DRUG TRANSPORT THROUGH THE BLOOD-BRAIN BARRIER
1) lipid-soluble drugs penetrate the BBB by simple diffusion
2) water-soluble drugs penetrate well through the BBB
3) during inflammation, the permeability of the BBB decreases
4) some substances (for example, amino acids) can pass through the BBB by filtration

7. RECEPTOR DRUGS WITH COMPETITIVE ACTION INCLUDE:
1) NSAIDs (non-steroidal anti-inflammatory drugs)
2) β-blockers
3) loop diuretics
4) nitrates

8. CHANGES IN DIGOXIN PHARMACOKINETICS IN HEART FAILURE
1) reduction of absorption in the gastrointestinal tract by 30%
2) reduction of plasma protein binding
3) enhancing metabolism in the liver
4) decrease in renal excretion

9. SELECTIVITY OF ACTION OF A DRUG DEPENDS ON
1) half-life
2) method of administration
3) protein bonds
4) doses

10. BIOAVAILABILITY OF A DRUG IS
1) the part of the dose introduced into the body that has undergone biotransformation
2) part of the dose introduced into the body that reaches the diseased organ
3) the portion of the dose administered to the body that reaches the systemic circulation unchanged or in the form of active metabolites
4) the part of the dose introduced into the body that has biological effects

4.1.2. Test tasks for midterm assessment
Conducted in the Moodle system
(Access mode:https://educ-amursma.ru/course/view.php?id=638)
Total number of test tasks – 475

1. ANTIBIOTICS USED IN THE TREATMENT OF PNEUMONIA, WHICH HAVE PRONUNCIATE ANTI-TUBERCULOSIS ACTIVITY AND ARE CLASSIFIED AS ANTI-TUBERCULOSIS DRUGS INCLUDE

A) fluoroquinolones
B) macrolides
B) aminopenicillins
D) cephalosporins

2. FOR THE TREATMENT OF ASYMPTOMATIC BACTERIURIA IN PREGNANT WOMEN, THE PRESCRIPTION OF ANTIBIOTICS IS INDICATED

A) penicillin series
B) antifungals
B) fluoroquinolones
D) tetracycline series

3. DURING LACTATION, IT IS RECOMMENDED TO USE TO LOWER BLOOD PRESSURE

A) Nifedipine
B) Drotaverine
B) Magnesium sulfate
D) Clonidine

4. THE ANTIDOTE FOR CARDIAC GLYCOSIDE POISONING IS

A) Unithiol
B) Riboxin
B) Panangin
D) Dopamine

5. USED FOR THE TREATMENT OF ULCERAL COLITIS

A) Sulfasalazine
B) Amoxicillin
B) Tetracycline
D) Pancreatin

6. OVERDOSE OF SYMPATHOMIMETICS CAUSES

A) pronounced vasoconstriction
B) bradycardia
B) atrioventricular heart block
D) reduction of the toxic effect of fluorothane

7. THE ONSET TIME OF NITROGLYCERIN EFFECT WHEN TAKEN SUBLINGUALLY IS (MIN)

A) 0.5-2
B) 5-6
B) 30
D) 8-10

8. IN VASOSPASTIC ANGINA, THE DRUGS OF CHOICE ARE BLOCKERS
A) slow calcium channels
B) histamine receptors
B) β-adrenergic receptors
C) α-adrenergic receptors

9. MORE OFTEN CAUSE ACUTE RENAL FAILURE
A) aminoglycosides
B) penicillins
B) cephalosporins
D) macrolides

10. ELIMINATION OF DRUG IS CHARACTERIZED BY
A) elimination rate constant
B) degree of proteinization
B) bioavailability
C) volume of distribution

11. ANGIOTENSIN CONVERTING ENZYME INHIBITORS ARE ABSOLUTELY CONTRAINDICATED FOR PRESCRIPTION IN
A) bilateral renal artery stenosis
B) decrease in creatinine levels
B) symptomatic hypertension
D) decompensation of chronic heart failure

12. THE MAIN PHARMACOLOGICAL EFFECT OF NITRATES IS CAUSED BY
A) a decrease in venous return to the heart
B) increasing venous return to the heart
B) an increase in the contractility of the myocardium
C) decrease in myocardial contractile activity

13. DURATION OF ACTION OF SALBUTAMOL IS (HOUR)
A) 4-6
B) 8-9
B) 10-12
D) 24-48

14. SIDE EFFECTS OF GLUCOCORTICOIDS INCLUDE
A) osteoporosis and hyperglycemia
B) hypoglycemia and tachycardia
B) bradycardia and cachexia
D) cachexia and osteoporosis

15. ANAPHYLACTIC SHOCK, ACCORDING TO THE WORLD ORGANIZATION OF ALLERGISTS, IS CALLED ANAPHYLAXIS ACCOMPANIED BY A DECREASE
A) systolic blood pressure below 90 mm Hg or 30% of the initial value
B) mean blood pressure below 100 mm Hg or 25% of the initial value
B) systolic blood pressure below 70 mm Hg.
C) average blood pressure by 50% of the initial value

16. CONTRAINDICATION FOR PRESCRIPTION OF NITRATES IS
A) closed-angle glaucoma
B) bronchial asthma
B) arterial hypertension
D) chronic heart failure

17. IN THE TREATMENT OF AGENT IN THE PRESENCE OF CONCOMITANT BRONCHIAL ASTHMA, THE PRESCRIPTION IS CONTRAINDICATED
A) beta blockers
B) ACE inhibitors
B) calcium antagonists
D) Sartans
18. AMONG THE B2-AGONISTS, THE ONE WITH A PROLONGED-ACTING EFFECT IS
A) Salmeterol
B) Salbutamol
B) Berotek
D) Ventolin
19. THE MAXIMUM NUMBER OF SIDE EFFECTS AMONG H2 BLOCKERS IS CAUSED BY
A) Cimetidine
B) Famotidine
B) Nizatidine
D) Ranitidine
20. SIDE EFFECTS OF STATIN THERAPY INCLUDE
A) myopathy
B) thyroid dysfunction
B) headaches
C) impotence
Answer standards: always correct 1.

4.2. Examples of situational tasks of current control

Task No. 1

Patient H., 36 years old, developed sharp pain, swelling, and hyperemia of the hand after local anesthesia with lidocaine hydrochloride solution during surgery for a felon of the second finger of the right hand. This was followed by difficulty breathing, hoarseness, and anxiety, followed by confusion. On examination: pronounced pallor of the skin, cyanosis of the lips and mucous membranes; respiratory rate 24 per minute, auscultation revealed vesicular breathing, dry wheezing; muffled heart sounds, pulse 110 per minute, arrhythmic, weak, blood pressure 80/40 mm Hg.

1. Clinical diagnosis?
2. Volume of anti-shock measures
3. Drug treatment

Standard answers to problem #1

1. Anaphylactic reaction to lidocaine: anaphylactic shock of the second degree of severity, acute benign course; acute urticaria, Quincke's edema.

2. Volume of anti-shock measures:

- stopping contact with the allergen;
- infusion therapy and treatment with adrenergic agents;
- ensuring airway patency;
- treatment with glucocorticoids.

3. Drug treatment.

- the site of allergen penetration should be injected once with an adrenomimetic solution (epinephrine 0.1% solution subcutaneously 0.1-0.3 ml with the addition of sodium chloride 0.9% solution 4-5 ml) and ice should be applied;

- if hemodynamic disturbances persist, continue subcutaneous administration of adrenomimetics at 5-10 minute intervals and switch to intravenous drip administration of drugs (epinephrine intravenously by drip at 2-4 mcg/min). Adrenomimetics are administered until arterial pressure is completely stabilized.

- in case of poor efficiency of adrenomimetics, with a high risk of complications associated

with impaired blood supply to vital organs, intravenous drip administration of dopamine at an initial rate of 2-5 mcg/kg per minute (if necessary 5-10 mcg/kg per minute) is indicated simultaneously with adrenomimetics. The administration of the drug is continued until complete stabilization of hemodynamic parameters.

- simultaneously with the administration of vasopressor drugs, it is necessary to administer colloidal and crystalloid solutions to replenish the volume of circulating blood, eliminate hemoconcentration and effectively restore arterial pressure at the perfusion level.

- simultaneously with the introduction of adrenomimetics, systemic glucocorticoids are administered in medium doses. Initial dose: dexamethasone intravenously by drip 8-32 mg; hydrocortisone intravenously by drip 250 mg; prednisolone intravenously by drip 90-120 mg once a day (the drugs are listed taking into account the degree of priority for use in anaphylactic shock). The duration of treatment and the dose of glucocorticoids are selected individually.

- symptomatic therapy: if broncho-obstructive syndrome persists, intravenous infusion of methylxanthines is administered, for example aminophylline (IV 5-6 mg/kg of a 2.4% solution for 20 minutes, then, if necessary, IV drip 0.2-0.9 mg/kg per hour until broncho-obstruction is eliminated.

Treatment with H1-histamine receptor blockers and diuretics is carried out against the background of complete stabilization of blood pressure and discontinuation of vasopressor therapy, only according to strict indications.

Task #2

Patient M., 45, has been treated for rheumatoid arthritis with diclofenac for 20 years. During her next visit to the rheumatologist, she complains of general weakness, dizziness, discomfort in the epigastric region, and occasional heartburn. During a general examination, pale skin is noticeable. Physical examination reveals moderate pain in the epigastric region. An examination was performed, which revealed: a clinical blood test showed moderate hypochromic anemia, a biochemical blood test showed a decrease in the level of serum iron, FGDS was performed - hyperemia, edema, erosions, an ulcer of the antral part of the stomach, a vessel with a gray thrombus, traces of contents the color of "coffee grounds" on the walls of the stomach.

1. Clinical diagnosis?
2. Risk factors for developing the condition?
3. Pathogenesis of the developed complication.
4. Tactics of management.
5. Prevention.

Standard answers to problem #2

1. "NSAID gastropathy: gastric ulcer complicated by bleeding."
2. Risk factors for NSAID gastropathy are divided into established and possible (E. L. Nasonov, 2000).

The identified risk factors include:

- old age;
- gastroduodenal ulcers or gastrointestinal bleeding, other gastrointestinal diseases in the anamnesis;
- concomitant diseases and syndromes (arterial hypertension, cardiac, hepatic, renal failure) and their treatment (angiotensin-converting enzyme inhibitors, diuretics);
- concomitant administration of anticoagulants, glucocorticoids or other NSAIDs (except for low doses of acetylsalicylic acid) with NSAIDs;
- taking high doses of NSAIDs;
- duration of NSAID therapy less than 3 months;
- use of NSAIDs with a long half-life and COX-2-non-selective.

Possible risk factors for NSAID gastropathy include:

- presence of rheumatoid arthritis;
- female gender;
- smoking;

- alcohol consumption;
- Helicobacter pylori infection.

3. Over time, NSAIDs (eg, aspirin) have a direct toxic effect on the gastroduodenal mucosa. However, in most cases, the risk of damage to the gastrointestinal mucosa is associated with blockade of the cyclooxygenase pathway and suppression of prostaglandin synthesis.

4. In the presence of risk factors, various approaches are proposed to determine patient management tactics.

- Change of anti-inflammatory drug. In this situation, selective cyclooxygenase (COX)-2 inhibitors are used.
- Conducting prophylactic treatment with misoprostol.
- Conducting prophylactic treatment with proton pump inhibitors (PPIs). A reduction in the incidence of ulceration and other serious adverse gastrointestinal effects has been demonstrated with combination therapy using PPIs

5. To reduce the gastrotoxicity of NSAIDs, it is necessary to modify the patient's lifestyle (quit drinking alcohol, smoking) and, if possible, correct the intake of NSAIDs and concomitant therapy.

4.3. List of practical skills that a student should have after mastering the discipline

1. Identify groups of drugs for the treatment of a specific disease based on the mechanism of action of the drugs, the state of the body's functions, age and the predicted impact of the planned pharmacotherapy.
2. To analyze the rationality of choosing, based on the criteria of effectiveness and safety, a specific drug in a group of analogues for the treatment of major diseases.
3. Select methods for monitoring the effectiveness and safety of the groups of drugs used and anticipate the risk of developing adverse drug reactions.
4. Taking into account the urgency of the condition and the main symptom complex, theoretically justify the rationality and necessity of combined administration of drugs, correction of the dosage regimen when prescribing drugs that induce and inhibit liver enzyme systems.
5. Assess drug interactions of prescribed therapy.
6. Calculate the main pharmacokinetic parameters of prescribed drugs.
7. To justify, in case of combined pathology, the optimal dosage regimen, the choice of dosage form of drugs, the dose, frequency and duration of administration of drugs.
8. Prescribe medications taking into account the anatomical and physiological characteristics of the body (pregnancy, lactation, childhood, old age and old age).
9. Have the skill to comply with the rules of medical ethics and deontology.
10. Evaluate the results of clinical trials of drugs published in medical journals

4.4. List of questions for the test (midterm assessment)

1. Clinical pharmacology: subject, structure, objectives, role in medicine.
2. Relationship between pharmacodynamics and pharmacokinetics. Determination of the magnitude of the pharmacological effect. Therapeutic effect, therapeutic range and therapeutic latitude of the drug. Maintenance dose.
3. Pharmacokinetics. Definition. Role in the development of pharmacotherapy, tasks, possibilities. Routes of administration of drugs. Absorption of drugs. Mechanisms of drug transport through biomembranes. Distribution of drugs in organs and tissues. Binding of drugs to proteins. Metabolism of drugs. Elimination of drugs.
4. Dosage of medicines.
5. Pharmacodynamics. Definition. Role and importance in the development of pharmacotherapy. Types of action of medicinal substances.Mechanisms of action of drugs
6. Drug interactions. Types: pharmaciststherapeutic, pharmacokinetic, pharmacodynamic interactions of drugs.
7. The influence of human age on the action of drugs.Features of pharmacotherapy in

newborns, during pregnancy, in lactating women, in old age

8. The role of hereditary factors in pharmacotherapy, pharmacogenetics.

9.Side effects of drugs. Specific side effects associated with pharmacological propertiesdrugs. Toxic effects of drugs. Steal syndrome. Paradrug side effects. Allergic reactions to drugs. Drug dependence. Withdrawal syndrome.

10. Drug toxicology. Main clinical syndromes of acute drug poisoning. Specific antidotes.

11. Pharmacoeconomics. Pharmacoepidemiology. Definition, objectives, main research methods and concepts

12. Nitrates: classification, mechanism of action, main pharmacodynamic effects, pharmacokinetic features, side effects, contraindications for use. Use in various forms of coronary heart disease.

13. Beta-blockers: classification, mechanism of action, main pharmacodynamic effects, pharmacokinetic features, side effects, contraindications for use. Beta-blocker withdrawal syndrome. Use in various forms of coronary heart disease.

14. Calcium antagonists: classification, main pharmacodynamic effects, side effects, contraindications for use. Use in various forms of coronary heart disease.

15. Thiazide diuretics: classification, main pharmacodynamic effects, side effects, contraindications for use. The place of diuretics in the treatment of arterial hypertension.

16. ACE inhibitors and AT1 receptor blockers: classification, mechanism of action, main pharmacodynamic effects, pharmacokinetic features, side effects, contraindications for use. The place of ACE inhibitors and AT1 receptor blockers in the treatment of arterial hypertension.

17. Alpha1-adrenergic receptor blockers and centrally acting drugs (central alpha2-sympathomimetics, I1-imidazoline receptor agonists): classification, main pharmacodynamic effects, side effects, indications and contraindications for use in hypertension.

18. Antiarrhythmic drugs of class Ia: classification, mechanism of action, main pharmacodynamic effects, indications for use, side effects. Possible ECG changes while taking class Ia drugs.

19. Antiarrhythmic drugs of class Ib: classification, mechanism of action, main pharmacodynamic effects, indications for use, side effects. Possible ECG changes while taking class Ib drugs.

20. Antiarrhythmic drugs of class Ic: classification, mechanism of action, main pharmacodynamic effects, indications for use, side effects. Possible ECG changes during the use of class Ic drugs.

21. Antiarrhythmic drugs class II: classification, memechanism of action, main pharmacodynamic effects, indications for use, side effects. Possible ECG changes while taking class II drugs.

22. Antiarrhythmic drugs of class III: classification, memechanism of action, main pharmacodynamic effects, indications for use, side effects. Possible ECG changes while taking class III drugs.

23. Antiarrhythmic drugs of class IV: classification, mechanism of action, main pharmacodynamic effects, indications for use, side effects. Possible ECG changes while taking class IV drugs.

24. Loop, thiazide, potassium-sparing diuretics and carbonic anhydrase inhibitors (classification, pharmacodynamic features). Tactics of administration in CHF. Spironolactone as a neurohumoral modulator.

25. ACE inhibitors and AT1 receptor blockers: classification, mechanism of action, main pharmacodynamic effects, pharmacokinetic features, side effects, contraindications for use. Place of ACE inhibitors and AT1 receptor blockersreceptors in the treatment of CHF.

26. Beta-blockers: classification, mechanism of action, main pharmacodynamic effects, pharmacokinetic features, side effects, contraindications for use. The place of beta-blockers in the treatment of CHF.

27. Platelet hemostasis. Medicines that prevent platelet thrombus formation: classification,

mechanism of action, indications and contraindications for use.

28. Coagulation hemostasis. Unfractionated and low molecular weight heparins: classification, mechanism of action, pharmacokinetic features, side effects, indications and contraindications for use. Monitoring heparin therapy.

29. Coagulation hemostasis. Indirect anticoagulants: classification, mechanism of action, side effects, indications and contraindications for use. Monitoring therapy.

30. Fibrinolysis system. Fibrinolytics: classification, mechanism of action, side effects, indications and contraindications for use.

31. NSAIDs: classification by anti-inflammatory activity, mechanism of action, main pharmacodynamic effects. Indications for use.

32. NSAIDs: classification by degree of selectivity to different types of COX. Main side effects, risk factors for complications, safety monitoring of long-term NSAID therapy.

33. Systemic glucocorticosteroids (SGCS): mechanism of action, classification, main pharmacodynamic effects, contraindications for use.

34. GCS: side effects. Secondary adrenal insufficiency: risk factors, prevention measures. Types of pharmacotherapy with GCS. Chronotherapy, alternating, intermittent therapy, pulse therapy.

35. Antacid drugs: classification, mechanism of action, main side effects, indications for use.

36. H2-histamine blockers: classification, mechanism of action, main side effects, indications for use.

37. Proton pump blockers: classification, mechanism of action, main side effects, indications for use.

38. Treatment of Helicobacter-associated diseases: general principles and regimens of eradication therapy.

39. Classification, clinical and pharmacological characteristics of penicillins. Indications for use.

40. Classification of cephalosporins. Clinical and pharmacological characteristics of cephalosporins. Indications for use.

41. Classification, clinical and pharmacological characteristics of aminoglycosides. Indications for use.

42. Classification, clinical and pharmacological characteristics of fluoroquinolones. Indications for use.

43. Classification, clinical and pharmacological characteristics of macrolides. Indications for use.

44. Classification of methylxanthines. Features of drug pharmacokinetics. Indications for use. Side and toxic effects. Main adverse drug interactions.

45. Basic principles of rational antibiotic therapy: goals, choice of drug, assessment of effectiveness, duration of antibiotic therapy. The concept of "step" antibiotic therapy. Approaches to the treatment of community-acquired pneumonia.

46. Step therapy of bronchial asthma. Clinical and pharmacological characteristics of ICS, indications for use, duration of administration, assessment of effectiveness.

47. Step therapy of bronchial asthma. Membrane stabilizing agents in the treatment of bronchial asthma: clinical and pharmacological characteristics of the main groups of drugs, indications for use.

48. Step therapy of bronchial asthma. Antileukotriene drugs in the treatment of bronchial asthma: clinical and pharmacological characteristics of the main groups of drugs, indications for use.

49. Short-acting beta2-adrenergic agonists and anticholinergicsgic agents in the treatment of bronchial asthma. Indications and contraindications for prescription, drugs of choice, principles of prescription, side effects.

50. Step therapy of bronchial asthma. Long-acting beta2-adrenergic agonists in the treatment of bronchial asthma. Indications and contraindications for use, drugs of choice, principles of use, side effects.