МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ,
МИНИСТЕРСТВО НАУКИ, ВЫСШЕГО ОБРАЗОВАНИЯ И ИННОВАЦИЙ
КЫРГЫЗСКОЙ РЕСПУБЛИКИ

МОО ВО Кыргызско-Российский Славянский университет
имени первого Президента Российской Федерации Б.Н. Ельцина

Clinical pharmacology

рабочая программа дисциплины (модуля)

Закреплена за кафедрой **Базисной и клинической фармакологии**

Учебный план 310501_21_45 лд ин.plx
Специальность 31.05.01. - РФ, 560001 - КР Лечебное дело
(для иностранных студентов)

Квалификация **врач-лечебник**

Форма обучения **очная**

Общая трудоемкость **3 ЗЕТ**

Часов по учебному плану 108
в том числе:
аудиторные занятия 64
самостоятельная работа 43,7

Виды контроля в семестрах:
зачет с оценкой 9

Распределение часов дисциплины по семестрам

Семестр (<Курс>.<Семестр на курсе>)	**9 (5.1)**		Итого	
Недель	18			
Вид занятий	УП	РП	УП	РП
Лекции	16	16	16	16
Практические	48	48	48	48
Контактная работа в период теоретического обучения	0,3	0,3	0,3	0,3
В том числе инт.	4	4	4	4
Итого ауд.	64	64	64	64
Контактная работа	64,3	64,3	64,3	64,3
Сам. работа	43,7	43,7	43,7	43,7
Итого	108	108	108	108

Программу составил(и):
MD, chief of basic and clinical pharmacology department KRSU, Zurdinova A.A. _____

Рецензент(ы):
PhD, chief of theraputic discipline #1 KRSU, Suranova G.J.;PhD, assistent professor, consultant WHO, Jumagulova J.O.
_____

Рабочая программа дисциплины

разработана в соответствии с ФГОС 3++:
Федеральный государственный образовательный стандарт высшего образования - специалитет по специальности 31.05.01 Лечебное дело (приказ Минобрнауки России от 12.08.2020 г. № 988)

составлена на основании учебного плана:
Специальность 31.05.01. - РФ, 560001 - КР Лечебное дело
(для иностранных студентов)
утвержденного учёным советом вуза от ____ _____протокол № _____

Рабочая программа одобрена на заседании кафедры

Протокол от 29.08.2025 г. № 1
Срок действия программы: 2021-2026 уч.г.
Зав. кафедрой Zurdinova A.A.

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

__ _____ 2026 г.

Рабочая программа пересмотрена, обсуждена и одобрена для исполнения в 2026-2027 учебном году на заседании кафедры

Протокол от __ _____ 2026 г. № __
Зав. кафедрой Zurdinova A.A.

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

__ _____ 2027 г.

Рабочая программа пересмотрена, обсуждена и одобрена для исполнения в 2027-2028 учебном году на заседании кафедры

Протокол от __ _____ 2027 г. № __
Зав. кафедрой Zurdinova A.A.

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

__ _____ 2028 г.

Рабочая программа пересмотрена, обсуждена и одобрена для исполнения в 2028-2029 учебном году на заседании кафедры

Протокол от __ _____ 2028 г. № __
Зав. кафедрой Zurdinova A.A.

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

__ _____ 2029 г.

Рабочая программа пересмотрена, обсуждена и одобрена для исполнения в 2029-2030 учебном году на заседании кафедры

Протокол от __ _____ 2029 г. № __
Зав. кафедрой Zurdinova A.A.

1. ЦЕЛИ ОСВОЕНИЯ ДИСЦИПЛИНЫ	
1.1	Formation of competencies in the field of clinical pharmacology, allowing to perform professional tasks in the field of therapeutic activities aimed at rational pharmacotherapy for patients in need of medical care;
1.2	Training in the selection of effective, safe, economically justified medicines for modern individualized pharmacotherapy using the latest information on pharmacokinetics, pharmacodynamics, drug interactions and side effects, evidence-based medicine and the formulary system

2. МЕСТО ДИСЦИПЛИНЫ В СТРУКТУРЕ ООП	
Цикл (раздел) ООП:	Б1.О
2.1	**Требования к предварительной подготовке обучающегося:**
2.1.1	Pharmacology
2.1.2	Latin language
2.1.3	Endocrinology
2.2	**Дисциплины и практики, для которых освоение данной дисциплины (модуля) необходимо как предшествующее:**
2.2.1	Anesthesiology, intensive care, intensive care
2.2.2	Outpatient therapy
2.2.3	Diagnostic and treatment standards
2.2.4	Family medicine

3. КОМПЕТЕНЦИИ ОБУЧАЮЩЕГОСЯ, ФОРМИРУЕМЫЕ В РЕЗУЛЬТАТЕ ОСВОЕНИЯ ДИСЦИПЛИНЫ (МОДУЛЯ)	
ОПК-7: Способен назначать лечение и осуществлять контроль его эффективности и безопасности	
Знать:	
Уровень 1	general principles of pharmacokinetics and pharmacodynamics of drugs, major adverse and toxic reactions; classifications and characteristics of the main groups of medicines, indications and contraindications for the use of medicines; types of dosage forms, doses of individual drugs; clinical and pharmacological characteristics and rational choice of specific medicines for the treatment of a disease or condition, taking into account the diagnosis, age and clinical picture in accordance with current procedures the provision of medical care, clinical guidelines, taking into account the standards of medical care.
Уровень 2	principles of rational choice of medicines in the treatment of patients with various nosological forms; features of the use of drugs depending on the age, the nature of the disease and the functional state of the patient's body; methods for evaluating the effectiveness and safety of drug therapy; methods for assessing the pharmacological effect, efficacy and safety of the main drug groups
Уметь:	
Уровень 1	to analyze the effect of drugs on the totality of their pharmacological properties and the possibility of their use for therapeutic treatment; choose the dosage form, determine the optimal route of administration, regimen and dose of medications; write prescriptions for medications.
Уровень 2	to develop a treatment plan, taking into account the diagnosis, the patient's age, and the clinical picture of the disease in accordance with current medical care procedures, clinical guidelines (treatment protocols) on medical care, taking into account the standards of medical care.; evaluate the effectiveness and safety of the treatment; fill out a notification about an undesirable reaction or lack of therapeutic effect of a drug; to substantiate pharmacotherapy in a specific patient with major pathological syndromes and urgent conditions; evaluate the effectiveness and safety of the treatment.
Владеть:	
Уровень 1	навыками выбора лекарственного средства по совокупности его фармакологических свойств, механизмов и локализации действия; навыками выбора определённой лекарственной формы, дозы и пути введения препаратов с учётом патологического состояния. навыками контроля эффективности и безопасности лечебных воздействий. Необходимо анализировать действие лекарственных средств с учётом возможных нежелательных и токсических реакций и возможность их предупреждения. навыками выявления нежелательных и токсических реакций на основе анализа клинических проявлений и применения инструментальных методов исследования.

Уровень 2	навыками выбора лекарственных препаратов для лечения пациентов с различными нозологическими формами в соответствии с действующими порядками оказания медицинской помощи, клиническими руководствами (протоколами лечения) по вопросам оказания медицинской помощи с учетом стандартов медицинской помощи; навыками проведения индивидуализированной фармакотерапии; навыками составления алгоритмов оценки эффективности и безопасности лекарственной терапии; навыками прогнозирования результатов лекарственного взаимодействия; навыками проведения индивидуализированной фармакотерапии в зависимости от возраста, характера заболевания и функционального состояния организма. больного

В результате освоения дисциплины обучающийся должен

3.1	**Знать:**
3.1.1	goals and objectives of clinical pharmacology, as opposed to pharmacotherapy;
3.1.2	types of pharmacotherapy;
3.1.3	principles of rational use of medicines;
3.1.4	steps of rational use of medicines: determination of the purpose of treatment, selection of a Personal group and a Personal drug, elements of information, instruction and warnings, monitoring of the effectiveness and safety of therapy;
3.1.5	group affiliation and pharmacodynamics of the main groups of medicines;
3.1.6	the main pharmacokinetic processes, pharmacokinetic parameters and their clinical significance.;
3.1.7	the dosage regimen of medicines for various pathologies, in the elderly, during pregnancy and lactation, depending on the nature of the disease and the functional state of the patient's body;
3.1.8	features of drug dosage depending on age, the nature of the disease and the functional state of the patient's body;
3.1.9	types of adverse drug reactions, methods of their prevention, diagnosis and correction.
3.1.10	types and mechanisms of drug interactions, drug interactions with food, herbal medicines, tobacco smoke components, alcohol.
3.1.11	the concept and clinical significance of pharmacogenetics, the main pharmacogenetic phenomena leading to a change in the pharmacological response to drugs.
3.1.12	methods for evaluating the clinical efficacy and safety of the main drug groups;
3.1.13	pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in diseases of internal organs and emergency conditions.
3.1.14	fundamentals of the formulary system (Basic Medicines Form);
3.1.15	the importance of clinical guidelines and protocols for the diagnosis and treatment of the most common diseases.
3.2	**Уметь:**
3.2.1	collect a pharmacological and allergological history;
3.2.2	choose effective, safe and affordable medicines in accordance with the clinical diagnosis, taking into account their pharmacokinetics, pharmacodynamics, interactions with other drugs, individual sensitivity, concomitant diseases, functional state of the body (pregnancy and lactation);
3.2.3	choose the doses of medicines in accordance with the results of therapeutic drug monitoring and pharmacogenetic studies;
3.2.4	calculate drug doses for patients with chronic renal failure, impaired liver function, the elderly and senile, and children;
3.2.5	calculate the loading and maintenance dose of the drug according to the indications;
3.2.6	explain to the patient the rules for the use of medicines.
3.2.7	to monitor the effectiveness and safety of the use of prescribed medicines;
3.2.8	to carry out the prevention, diagnosis and correction of adverse drug reactions, to fill out documents on notification of the development of adverse drug reactions;
3.2.9	diagnose and treat drug overdose.
3.2.10	to carry out medical treatment of a specific patient with diseases of internal organs and urgent conditions;
3.2.11	use sources of clinical and pharmacological information such as Forms, clinical manuals, protocols, reference books, electronic databases, and online resources.
3.3	**Владеть:**
3.3.1	choose a P-group of (personal) medicines depending on the diagnosis and purpose of treatment;
3.3.2	choose a P-drug based on efficacy, safety, acceptability and cost.
3.3.3	choose the dosage form, route of administration, and dosage regimens of the drug in a specific clinical situation;
3.3.4	predict and determine the risk of side effects of drugs;
3.3.5	to carry out a combined prescription of medicines;
3.3.6	inform the patient about the planned drug therapy;

3.3.7	to evaluate the effectiveness and safety of drug therapy.

4. СТРУКТУРА И СОДЕРЖАНИЕ ДИСЦИПЛИНЫ (МОДУЛЯ)

Код занятия	Наименование разделов и тем /вид занятия/	Семестр / Курс	Часов	Компетен-ции	Литература	Инте ракт.	Пр. подг.	Примечание
	Раздел 1. General Clinical Pharmacology (10)							
1.1	Introduction to clinical pharmacology. Pharmacotherapy /Лек/	9	2	ОПК-7	Л1.1Л2.1 Л2.2 Э1			
1.2	Clinical pharmacokinetics and pharmacodynamics of medicinal products /Лек/	9	2	ОПК-7	Л1.1Л2.1 Л2.2 Э1			
1.3	Side effects of medications. Pharmacovigilance. /Лек/	9	2	ОПК-7	Л1.1Л2.1 Л2.2 Э6 Э7 Э9			
1.4	Drug interaction, interaction assessment /Лек/	9	2	ОПК-7	Л1.1Л2.1 Л2.2 Э3 Э4 Э8			
1.5	Features of the use of medicines in the elderly, children and pregnant women /Лек/	9	2	ОПК-7	Л1.1Л2.1 Л2.2 Э6 Э7 Э10			
1.6	Clinical pharmacokinetics and pharmacodynamics of medicines /Пр/	9	3	ОПК-7	Л1.1Л2.1 Л2.2 Э1			Working on an interactive clinical pharmacology website
1.7	Side effects of medications. Pharmacovigilance /Пр/	9	3	ОПК-7	Л1.1Л2.1 Л2.2 Э1 Э6 Э7 Э9 Э10			Solving situational problems, using electronic databases
1.8	Drug interactions. Assessment of drug interaction /Пр/	9	3	ОПК-7	Л1.1Л2.1 Л2.2 Э3 Э4 Э8	1		Solving situational problems, using electronic databases
1.9	Principles of rational use of medicines. Selection criteria for P-group and P-drug /Пр/	9	3	ОПК-7	Л1.1Л2.1 Л2.2 Э10			Compilation of tables by choice and calculations based on selection criteria
1.10	Independent work on the section "General clinical pharmacology" /Ср/	9	16	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э1 Э2 Э3 Э4 Э5 Э6 Э7 Э8 Э9 Э10			Preparation for the module in the section "General clinical pharmacology", work in databases, preparation of presentations, abstracts, solving situational problems, analysis of pharmacokinetic parameters of drugs
	Раздел 2. Private clinical pharmacology							

2.1	Clinical pharmacology of medicines used for hypertension and principles of rational use of antihypertensive agents /Лек/	9	2	ОПК-7	Л1.2Л2.1 Л2.2 Э2 Э3 Э4			
2.2	Clinical pharmacology of medicines used for bronchial obstruction. Modern principles of bronchial obstruction treatment /Лек/	9	2	ОПК-7	Л1.2Л2.1 Л2.2 Э2 Э3 Э4			
2.3	Clinical pharmacology of antibacterial agents, modern approaches /Лек/	9	2	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э5			
2.4	Clinical pharmacology of medicines used for coronary heart disease /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э6 Э7			
2.5	Clinical pharmacology of medicines used for dyslipidemia /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4			
2.6	Clinical pharmacology of medicines used for hemostasis disorders /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э6 Э7			
2.7	Clinical pharmacology of medicines used in diabetes mellitus /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э6 Э7			
2.8	Clinical pharmacology of medicines used for thyroid diseases /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э6 Э7 Э10			
2.9	Clinical pharmacology of anti-inflammatory and antiallergic drugs. DMARDs therapy. /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э5			
2.10	Clinical pharmacology of medicines used in elderly and senile patients /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4	1		
2.11	Clinical pharmacology of antibacterial agents. Principles of antibiotic therapy. Antibiotic resistance. /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э5 Э6 Э7			
2.12	Clinical pharmacology of antiviral and antiretroviral drugs. Principles of treatment of viral diseases and coronavirus infection /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э5 Э6 Э7			
2.13	Clinical pharmacology of medicines used in COVID-19. Monitoring of the safety and effectiveness of therapy /Пр/	9	3	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э6 Э7			

2.14	Protection of the Protocol for evaluating the use of medicines in a supervised patient /Пр/	9	6	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2	2		Preparation and protection of the Protocol on the assessment of the use of medicines (presentation, protocol design)
2.15	Independent work in the section "Private clinical pharmacology" /Ср/	9	19,7	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2 Э2 Э3 Э4 Э5 Э6 Э7 Э8 Э9 Э10			Solving situational problems related to clinical problems, selecting personal medications according to basic criteria, monitoring the effectiveness and safety of the patient's therapy
2.16	Contact work of theoretical training /КрТО/	9	0,3	ОПК-7				
2.17	Intermediate certification /ЗачётСОц/	9	8	ОПК-7	Л1.1 Л1.2Л2.1 Л2.2			the score is "credited" or "uncredited"

5. ФОНД ОЦЕНОЧНЫХ СРЕДСТВ

5.1. Контрольные вопросы и задания

The student should know:
1. The subject and objectives of clinical pharmacology. Sections of clinical pharmacology (clinical pharmacokinetics, pharmacodynamics, pharmacogenetics, pharmacoeconomics, pharmacoepidemiology).
2. The concept of pharmacotherapy. Types of pharmacotherapy (etiotropic, pathogenetic, symptomatic, preventive). The basic principles of rational pharmacotherapy (validity, minimization, rationality, economy, controllability, individualization). Stages of pharmacotherapy. Pharmacological history (concepts, collection rules, interpretation). Principles of developing recommendations to patients on the rules of drug use. Acute pharmacological test (concept, purpose, rules of conduct). Patient's commitment to treatment is compliance (a concept, factors influencing treatment adherence, methods of increasing patient's commitment to treatment). Responsible self-medication.
3. Evaluation of the clinical efficacy and safety of medicines. Principles of developing programs for monitoring the effectiveness and safety of medicines. Methods for assessing the effect of medicines on the quality of life.
4. Clinical pharmacokinetics. The main pharmacokinetic parameters and their clinical significance. Pharmacokinetic curve. Calculation of the loading and maintenance dose of the drug. Calculation of the drug dose in patients with chronic renal failure. Dose adjustment of the drug in patients with impaired liver function. The main pharmacokinetic processes (absorption, distribution, binding to plasma proteins, metabolism, drug excretion). Mechanisms of drug absorption; the involvement of glycoprotein-P in the absorption of drugs; factors affecting the absorption of drugs; routes of administration of drugs. Distribution of medicines. The relationship of drugs with plasma proteins. Factors affecting the distribution and binding of drugs to plasma proteins (diseases, drugs). Metabolism (biotransformation) of drugs: reactions of phase I (oxidation, reduction, hydrolysis) and phase II (conjugation). Presystemic drug metabolism ("first pass effect"). Medicines with high and low hepatic clearance. Clinically significant cytochrome P-450 isoenzymes (CYP3A4, CYP2D6, CYP2C9, CYP2C19). Phenotyping of drug metabolism enzymes and its clinical significance. Induction and inhibition of drug metabolism enzymes: mechanisms, clinical significance. Extrahepatic metabolism of drugs (metabolism of drugs in the intestine, lungs, kidneys). Factors affecting the metabolism of drugs (gender, age, diseases). Drug elimination: mechanisms and organs involved in drug elimination. The role of organic anion and glycoprotein-P transporters in drug elimination. Factors affecting the elimination of drugs (gender, age, diseases). Methods for the determination of drugs in biological fluids. Organization of the activities of the laboratory of clinical pharmacokinetics in a multidisciplinary hospital.
5. Pharmacodynamics. Mechanisms of action of drugs. Antagonists, agonists, partial agonists. Target drug molecules (receptors, enzymes, ion channels). Types of pharmacological response: expected pharmacological response, hyperreactivity, tachyphylaxis, idiosyncrasy. The relationship between pharmacokinetics and pharmacodynamics. The concept of the therapeutic range. Therapeutic drug monitoring (indications, clinical significance, interpretation of results).
6. Legal and ethical aspects of the use of medicines. Clinical and pharmacological service in medical institutions (principles of organization, main functions).
7. Undesirable drug reactions. WHO classification: reactions A, B, C, D, E. Toxic effects of drugs. Undesirable drug reactions caused by the pharmacological effects of drugs. Allergic and pseudoallergic reactions. Carcinogenicity of medicines. Drug addiction

(mental and physical). Withdrawal syndrome. Risk factors for the development of adverse drug reactions. Diagnosis, correction and prevention of adverse drug reactions. Rules for notifying the drug supervision authorities about the occurrence of undesirable drug reactions.
8. Drug overdose: diagnosis, first aid, basic principles of therapy. Overdose with opiates, barbiturates, and tranquilizers.
9. Drug interactions. Rational, irrational, and dangerous combinations. Types of drug interactions. Pharmacokinetic drug interactions (at the levels of absorption, distribution, metabolism, and elimination). Pharmacodynamic interaction of drugs (direct and indirect). Synergism and antagonism. The interaction of medicines with food, alcohol, tobacco smoke components, and herbal preparations. Risk factors for drug interactions.
10. Features of pharmacokinetics and pharmacodynamics of drugs in pregnant women and fetus. Categories of medicines according to the degree of risk to the fetus according to WHO: A, B, C, D, E, X. Teratogenicity, embryotoxicity and fetotoxicity of medicines. Principles of pharmacotherapy in pregnant women. Features of pharmacokinetics and pharmacodynamics of drugs in lactating women. Principles of pharmacotherapy in lactating women.
11. Clinical pharmacogenetics. Pharmacogenomics. Genetic features of the patient that affect the pharmacokinetics of drugs: polymorphisms of drug metabolism enzyme genes; polymorphisms of drug transporter genes. Extensive, slow and fast metabolizers. Genetic features of the patient that affect the pharmacodynamics of drugs: genetic polymorphisms of receptors, enzymes, and ion channels. The clinical significance of pharmacogenetics for the individualization of pharmacotherapy. Organization of the activities of the laboratory of clinical pharmacogenetics in a multidisciplinary hospital.
12. Principles of rational use of medicines, steps.
13. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in diseases of internal organs and emergency conditions.
14. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, adverse drug reactions, drug interactions used in hypertension.
15. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in bronchial obstructive syndrome.
16. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in coronary heart disease.
17. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in dyslipidemia.
18. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in diabetes mellitus.
19. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used for hemostasis disorders.
20. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in thyroid diseases.
21. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, interaction of antibacterial agents.
22. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, interaction of antiviral and antiretroviral agents.
23. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, interaction of antitumor agents.
24. Clinical pharmacokinetics, pharmacodynamics, indications, contraindications, undesirable drug reactions, drug interactions used in diseases of the gastrointestinal tract.
Be able to:
1. Determine the purpose of treatment and the steps in choosing a Personal group and a Personal drug.
2. Develop a program for monitoring the safety of medicines, taking into account the adverse reactions they may cause.
3. To prevent, diagnose, and correct adverse drug reactions.
4. Fill out official documents on notification of authorized bodies about the development of undesirable drug reactions.
5. To diagnose and treat drug overdose.
6. Choose medicines based on their interaction with co-administered medicines.
7. Instruct patients about possible drug interactions with food, herbal remedies, tobacco smoke components, and alcohol.
8. Choose medicines for pregnant women, taking into account the degree of risk to the fetus and for lactating women, taking into account the ability of medicines to penetrate into breast milk.
9. Interpret the results of pharmacogenetic studies of the choice of drugs and their doses.
10. Prescribe (choose) medication for a specific patient for various diseases and emergencies.
11. To carry out medical treatment of a specific patient in case of diseases and urgent conditions.
Master the skills
1. choose a P-group of (personal) medicines depending on the diagnosis and purpose of treatment;

5.2. Темы курсовых работ (проектов)

Not provided

5.3. Фонд оценочных средств

Modul on "General Clinical Pharmacology"
TICKET No. 1
1. The subject of clinical pharmacology, goals and objectives. Pharmacotherapy, its main types.
2. The main pharmacokinetic parameters: clearance, steady-state concentration of the drug in plasma, determination of clearance, area under the curve.
3. Adverse effects of drugs, classification, diagnosis of adverse effects of drugs, reports of adverse reactions of drugs.
SOLVE THE CLINICAL PROBLEM:

To stop an attack of bronchial asthma, a Cp of theophylline equal to 10 mg/ l is required. The average Cl of theophylline is 2.8 l/hr/kg. How fast should an intravenous infusion be carried out if the F for intravenous administration is 100%?
TICKET No. 2
1. Clinical pharmacokinetics, routes of administration of drugs, factors affecting their routes of administration, absorption of drugs, indicators and factors affecting the absorption of drugs.
2. Drug interactions: pharmacokinetic interactions. Give examples.
3. Adverse reactions of type A, their characteristics. Give examples.
SOLVE THE CLINICAL PROBLEM:
To stop an attack of bronchial asthma, a Cp of theophylline equal to 10 mg/ l is required. The average Cl of theophylline is 2.8 l/hr/kg. Calculate the oral dose of theophylline if Δt is 12 hours and F is 96% when ingested?
TICKET No. 3
1. Clinical pharmacodynamics: the mechanism of action of drugs, the selectivity of drugs, the dose of drugs.
2. Basic pharmacokinetic parameters: volume of distribution, determination of volume of distribution, calculation of loading dose.
3. Adverse reactions of type B, their characteristics. Give examples.
SOLVE THE CLINICAL PROBLEM:
To stop an attack of bronchial asthma, a Cp of theophylline equal to 10 mg/ l is required. The average Cl of theophylline is 2.8 l/hr/70kg. Calculate Δt if the oral dose of theophylline is 175 mg and F is 96%?
TICKET No. 4
1. Principles of rational use of medicines, criteria for the selection of the N-group and the N-drug.
2.The main pharmacokinetic parameters: the half-life of drugs, the determination of t1/ 2, the kinetics of drug elimination, the kinetics of drug accumulation, the choice of a time interval for dose administration.
3. Type C adverse reactions, their characteristics. Give examples.
SOLVE THE CLINICAL PROBLEM:
To stop psychomotor agitation, a target Cp of diazepam 0.3 mg/l is required. The average Cl of diazepam is 1.62 l/hr/kg. How fast should an intravenous infusion be carried out if the F for intravenous administration is 100%?
TICKET No. 5
1. The main issues of clinical pharmacokinetics: binding of drugs to blood and tissue proteins, drug excretion, kinetics of metabolites.
2. Variability of the effect of medicines: features of the use of medicines during pregnancy and lactation.
3. Adverse reactions of type D, their characteristics. Give examples.
SOLVE THE CLINICAL PROBLEM:
To stop an attack of bronchial asthma, a Cp of theophylline equal to 10 mg/ l is required. The average Cl of theophylline is 2.8 l/hr/70kg. Calculate the Δt if the oral dose of theophylline is 175 mg, and the F is 96%, but the Cl of the drug is reduced by 2 times.
TICKET No. 6
1.The main issues of clinical pharmacokinetics are the dependence of pharmacokinetics on dose and time, dosage regimens of drugs, bioequivalence of drugs.
2. Pharmacodynamic interaction of drugs. Give examples.
3. Categories of action of medicines according to the FDA during pregnancy.
SOLVE THE CLINICAL PROBLEM:
To relieve the epileptic status, a target Cp of 0.3 mg/l of diazepam is required. The average Cl of diazepam is 1.62 l/hr/kg. Calculate the PD
is diazepam for oral administration if the Δt is 10 hours and the F for oral administration is 98%?
TICKET No. 7
1. Clinical pharmacokinetics: factors influencing dose selection, drug metabolism, biotransformation processes, saturation metabolism.
2. Clinical pharmacodynamics: the mechanism of action of drugs, the selectivity of drugs, the dose of drugs.
3. The main steps for the rational use of medicines, criteria for the selection of the N-group and the N-drug.
SOLVE THE CLINICAL PROBLEM:
To relieve the epileptic status, a target Cp of 0.3 mg/l of diazepam is required. The average Cl of diazepam is 1.62 l/hr/ 70 kg. Calculate the Δt
if the oral PD of diazepam is 7.5 mg and the F is 98%, but the Cl of the drug is reduced by 37%.
TICKET No. 8
1. Drug interactions: pharmacodynamic and pharmacokinetic.
2. The main issues of clinical pharmacokinetics: bioavailability of medicines, distribution of medicines.
3. Adverse reactions, classification, monitoring of adverse reactions.
SOLVE THE CLINICAL PROBLEM:
To relieve pain, a target Cp of indomethacin 0.3 mg/l is needed. The average Cl of indomethacin is 1.76 l/hr/kg. Calculate the oral dose of indomethacin if the Δt is 8 hours and the oral F is 98%?

Module on the section "Private clinical pharmacology"
Example of a task:
I.Complete test tasks:
1. Which tableted antihypertensive drugs cause a rapid decrease in blood pressure?
1. Reserpine
2.captopril
3.nifedipine
4.Clonidine
5.hydrochlorothiazide

2.List the contraindications to prescribing ACE inhibitors:
1. vascular stenosis of a single kidney
2. Diabetic nephropathy
3. pyelonephritis
4.Bilateral renal artery stenosis
5. interstitial nephritis
3. Which diuretic can enalapril be combined with?
1.Hydrochlorothiazide
2.veroshpiron
3.furosemide
4.Indapamide
4. What side effects are characteristic of angiotensin II receptor antagonists?:
1. headache
2. dizziness
3. anemia
4. tachycardia
5. bradycardia
6.angioedema
7. dry cough
5. What is advisable to use for prostate adenoma, as well as for lipid disorders?
1.Hydrochlorothiazide
2. stabbed
3.Doxazosin
4.Propranolol
6.Specify the side effects of nifedipine:
1.bradycardia
2. tachycardia
3. swelling of the legs and feet
4. redness
5. Headache
7. What antihypertensive agents are indicated for concomitant peripheral vascular diseases?
1. Calcium antagonists
2. ACE inhibitors
3.beta-blockers
4. alpha-blockers
8. List the groups of antihypertensive drugs that reduce the activity of the renin-angiotensin-aldosterone system:
1. ACE inhibitors
2. beta-blockers
3. Angiotensin II
antagonists 4.Thiazide diuretics
5.Calcium antagonists
9. For the treatment of hypertension during pregnancy and lactation, the following are absolutely contraindicated:
1. ACE inhibitors
2. Calcium antagonists
3. beta-blockers
4. alpha-blockers
10. Which drug is most characterized by the effect of the "first dose" in the form of orthostatic hypotension?
1.hydrolazine
2.Captopril
3.Glyceryl trinitrate
4. clonidine
5.Prazosin
11. Which drug reduces the level of total cholesterol and increases the content of high-density lipoproteins during long-term therapy?
1.prazosin
2.atenolol
3.hydrochlorothiazide
4. furosemide
12. Is nifedipine most acceptable in a patient with arterial hypertension and concomitant spontaneous angina?
1. nifedipine
2.atenolol
3. Clonidine
4.prazosin
13.Specify antihypertensive drugs that are prescribed with caution in combination with diabetes mellitus and hypertension:
1.verapamil
2.propranolol
3.diltiazem
4.Hydrochlorothiazide

5.enalapril
14. Specify rational combinations of antihypertensive drugs:
1. diuretic + beta-blocker
2.diuretic + ACE inhibitor
3.verapamil + diltiazem + beta-blockers
4.Beta-adrenoblocker+dihydropyridine calcium antagonist
5.Dihydropyridine calcium antagonist+alpha-adrenoblocker
6.ACE inhibitor+acetylsalicylic acid
7.Calcium antagonist+ACE inhibitor
15.The method of monitoring the effectiveness of antihypertensive therapy is:
1. Daily ECG monitoring
2. one-time blood pressure measurements
3. dynamics of the lipid spectrum
4. measurement of blood pressure in ortho- and clinopause
16. For the treatment of young patients with arterial hypertension, the most acceptable:
1. clonidine
2.captopril
3.atenolol
4. nifedipine
17. The most rational combination in a patient with arterial hypertension and CBS would be:
1.propranolol + hydrochlorothiazide
2.atenolol + nifedipine
3.Propranolol + verapamil
4.Prazosin + nifedipine
18.Relief of an uncomplicated hypertensive crisis should begin with the appointment of:
1.nifedipine 10-20 mg under the tongue
2.40 mg propranolol inside
3.Intravenous administration of sodium nitroprusside
4.40 mg of furosemide inside
19. Specify the antihypertensive drugs that are contraindicated for the relief of hypertensive crisis with acute encephalopathy:
1.sodium nitroprusside
2.clonidine
3.furosemide
4.beta-blockers
5.nifedipine
6. All of the above
20. Which antihypertensive drugs are contraindicated in patients with cardiac hypertensive crisis complicated by myocardial infarction:
1. Calcium antagonists
2. beta-blockers
3.diuretics
4.Sodium nitroprusside
5.Clonidine
6.Hydralazine

II.Make a choice based on the principles of rational use of medicines (your steps in conducting pharmacotherapy):
• The purpose of treatment;
•Selection of a Personal group or groups for your patient (according to the criteria of efficacy, safety, acceptability and cost) – the data should be presented in a table with calculations;
•The choice of a Personal drug or drugs (according to the criteria of efficacy, safety, acceptability and cost) - the data should be presented in a table with calculations;
•Write a prescription for a selected drug or medications;
•Informing, instructing, and cautioning about the selected drug or preparations;
•Monitoring of ongoing treatment.

Topics of the essays:
•The importance of chronopharmacology for the effectiveness of pharmacotherapy
•The importance of pharmacogenetics and pharmacogenomics for the clinician
•Pharmacovigilance. Rare adverse reactions
•Modern antihypertensive therapy, the role and place of pharmacoeconomic research on the study of AHP
•Modern therapy of bronchial asthma, pharmacoeconomic analysis of treatment
•Antiplatelet therapy and its consequences
•Drugs used in diabetes mellitus. Monitoring of treatment.
•Antiviral therapy, current trends

The student's formulary list of medicines (includes the following articles on the drug: pharmacodynamics, pharmacokinetics, indications and contraindications for use, special instructions, side effects):
Enalapril

Losartan
Bisoprolol
Hydrochlorothiazide
Isosorbide dinitrate
Amlodipine
Clopidogrel
Warfarin
Salbutamol
Beklamethasone
Gliclazide
Levothyroxine
Amoxicillin
Ceftriaxone
Ciprofloxacin
Azithromycin
Doxycycline
Acyclovir
Pegylated interferon a2a, a2b
Sfosbuvir
Tenofovir
Zidovudine
Fluconazole
Rituximab
Cisplatin
Doxorubicin

5.4. Перечень видов оценочных средств

Module on "General Clinical Pharmacology"
Module on "Private clinical Pharmacology"
Protocol for evaluating the use of medicines in a supervised patient
Report
Student's personal form

6. УЧЕБНО-МЕТОДИЧЕСКОЕ И ИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ (МОДУЛЯ)

6.1. Рекомендуемая литература

6.1.1. Основная литература

	Авторы, составители	Заглавие	Издательство, год
Л1.1	Бегг Э.	Клиническая фармакология: учебное пособие	М.: БИНОМ. Лаборатория знаний 2004
Л1.2	Кукес В.Г.	Клиническая фармакология: Учебник	ГЭТАР-МЕДИА 2014

6.1.2. Дополнительная литература

	Авторы, составители	Заглавие	Издательство, год
Л2.1	Кукес В.Г., Стародубцев А.К.	Клиническая фармакология и фармакотерапия: учебник для вузов	М.: ГЭОТАР-МЕД 2004
Л2.2	Лоуренс Д.Р., Беннетт П.Н., Браун М.Дж.	Клиническая фармакология: учебное пособие	

6.2. Перечень ресурсов информационно-телекоммуникационной сети "Интернет"

Э1	Интерактивная клиническая фармакология (Новая Зеландия)	www.icp.org
Э2	Реестр лекарственных средств Российской Федерации	www.rlsnet.ru
Э3	Международная база данных ЛС	www.drugs.com
Э4	База данных по общеврачебной практике (раздел лекарства)	www.medscape.com
Э5	Межрегиональная ассоциация по клинической микробиологии и антимикробной химиотерапии (МАКМАХ)	www.antibiotic.ru
Э6	Американское общество клинических фармакологов и фармакотерапевтов	http://www.ascpt.org/
Э7	Европейское общество клинических фармакологов и фармакотерапевтов	http://www.eacpt.org
Э8	Ресурс по взаимодействию лекарственных средств	http://medicine.iupui.edu/flockhart

Э9	Британский ежемесячный бюллетень по безопасности лекарственных средств	http://www.mhra.gov.uk/Publications/Safetyguidance/Dr
Э10	Всемирная организация здравоохранения	www.who.int.org

6.3. Перечень информационных и образовательных технологий	
6.3.1 Компетентностно-ориентированные образовательные технологии	
6.3.1.1	traditional verbal methods (lectures, talks, discussions, explanations);
6.3.1.2	visual methods (presentations, stands, posters, types of dosage forms, reference books, textbooks, teaching aids, etc.);
6.3.1.3	methods of practical training – conducting practical exercises: solving situational problems, tests, performing SRS - independent work with reference books and literature (conventional and electronic), independent written homework.
6.3.1.4	the method of problem-oriented learning - individual, pair and group work is organized, role-playing games are used, work is carried out with documents and various sources of information on drugs, medical history, selection of the P-group and the P-drug, questions of information, instruction and warnings on the use of drugs.
6.3.1.5	Innovative method: on-line modules for clinical pharmacology on a special website with separate sections on the subject (for example, there are 15 modules on clinical pharmacokinetics and pharmacodynamics), work in international databases on drug interaction, search for medical information and its critical assessment.
6.3.1.6	oral control methods: frontal survey, individual survey, preparation of reports on the SRS;
6.3.1.7	methods of written control: control and modular work; performance of written test tasks on the SRS; essays on the SRS;
6.3.1.8	methods of current control: control and modular work; work with medical records, preparation of a Protocol for evaluating the use of drugs in supervised patients, a student's Drug Form.
6.3.2 Перечень информационных справочных систем и программного обеспечения	
6.3.2.1	www.drugs.com
6.3.2.2	www.icp.org.nz
6.3.2.3	www.guidelines.org
6.3.2.4	http://medicine.iupui.edu/flockhart
6.3.2.5	www.antibiotic.ru
6.3.2.6	www.medscape.com

7. МАТЕРИАЛЬНО-ТЕХНИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ (МОДУЛЯ)	
7.1	For conducting lecture-type classes, there are 2 lecture halls equipped with demonstration equipment - computers, multimedia devices, educational and visual aids (thematic presentations according to the discipline's work program) .
7.2	For practical classes, there are 6 classrooms equipped with specialized furniture, visual stands in all sections of the discipline, blackboards, educational showcases with various medicines, technical means - Wi-Fi, computers, multimedia devices.
7.3	To provide educational information, the department has a cathedral library, reference books of medicines, Forms, manuals, teaching aids, teaching guidelines, teaching aids, visual thematic stands, printers, photocopying machines, scanners.
7.4	To ensure discipline, the department uses visual demonstration materials - trays with a set of medicines in various forms: solid, soft, liquid dosage forms, a set of prescription assignments, prescription forms, sets of control papers, colloquiums on all sections of the discipline, a list of medicines to be included in the Student's Form.

8. МЕТОДИЧЕСКИЕ УКАЗАНИЯ ДЛЯ ОБУЧАЮЩИХСЯ ПО ОСВОЕНИЮ ДИСЦИПЛИНЫ (МОДУЛЯ)

To support feedback, all teaching materials and manuals are posted on the department's website. In addition, students receive weekly assignments for independent work, and students send completed homework and current assignments for practical classes via whatsapp or email to the teacher.

The training consists of classroom classes (108 hours), including a lecture course (16 hours) and practical exercises (48 hours), and independent work (43.7 hours). During the course of study, students complete 2 sections on clinical pharmacology: "General Clinical Pharmacology" and "Private Clinical Pharmacology".

The main academic time is devoted to practical work on mastering the skills of analyzing the pharmacokinetic parameters of medicines, choosing a Personal group and a Personal drug for certain clinical conditions, monitoring the effectiveness and safety of treatment, informing, instructing and cautioning. The proportion of classes conducted in interactive forms is at least 20% of classroom classes. Examples of interactive forms and methods of conducting classes: role-playing games, training, situational tasks, discussion with brainstorming, protection of the Protocol for evaluating the use of medicines in a supervised patient.

When studying the academic discipline (module), it is necessary to use the knowledge, skills and mastery of skills acquired in the study of pharmacology, therapy and to master practical skills: to analyze and evaluate the quality of prescribed treatment; to collect a complete medical history of the patient, to conduct a survey of the patient, his relatives (to collect biological, medical, psychological and social information; conduct a physical examination of the patient (examination, palpation, auscultation, blood pressure measurement, determination of pulse characteristics, respiratory rate), send him for laboratory and instrumental examination, for consultation with specialists; interpret the results of the examination, make a preliminary diagnosis to the patient, outline the scope of additional studies to clarify the diagnosis, formulate a clinical diagnosis; determine the purpose of treatment, select a Personal group and a Personal drug, write out a prescription for the selected drug, inform, instruct, warn the patient, monitor

the treatment; justify pharmacotherapy in a particular patient with underlying pathological syndromes and urgent conditions, determine the methods of administration, regimen and dose of medications, evaluate the effectiveness and safety of the treatment (based on based on evidence-based medicine).
Practical classes are conducted both in the traditional form, including clinical demonstrations, clinical reviews and independent work of students with patients, the use of visual aids, video and multimedia materials, situational and test tasks, and in the form of active and interactive forms of classes in accordance with the requirements of the Federal State Educational Standard for Higher Professional Education (problem lecture, lecture - provocation, role-playing and business games, trainings, game design, case study, discussions with and without brainstorming).
Independent work of students implies preparation for classes, current, boundary and intermediate controls, performing analytical work – drawing up a Protocol for evaluating the use of medicines in a supervised patient.
Work with educational literature is considered as a type of educational work in the discipline "clinical pharmacology" and is performed within the hours allotted for its study (in the section of the SRS). Each student is provided with access to the department's library collections, including electronic resources.
Methodological recommendations for students and guidelines for teachers have been developed for each section of the academic discipline.
During the study of the academic discipline, students independently supervise a patient with diseases of internal organs in a hospital, formalize and present a fragment of the academic medical history highlighting the leading clinical syndrome and the academic medical history of a patient with diseases of internal organs, including a comprehensive examination of the patient: questioning, physical examination, a plan for laboratory and instrumental research and analysis of the results, highlighting and the justification of the leading syndrome, the justification of the diagnosis with differential diagnosis, non-drug and drug treatment, rational use of medicines.

Writing a Protocol contributes to the formation and consolidation of skills for the rational use of medicines. The student's work in a group creates a sense of teamwork and sociability.
Students pass a milestone certification in the form of 2 colloquiums in the sections "General clinical pharmacology" and "Private clinical pharmacology" and pass Protocols for evaluating the use of medicines in a supervised patient.
There are 8 tickets for section 1 "General Clinical Pharmacology". The colloquium consists of 3 questions and 1 situational task.
According to section 2 "Private clinical pharmacology" there are 8 options. The colloquium consists of 2 blocks: 1 block – tests and 2 block - a problematic task with RILS steps: to determine the diagnosis, the purpose of treatment, the choice of the P-group and the P-drug, to write a prescription. informing, instructing and warning, monitoring treatment.
When evaluating a work, 1 grade is given for each block (on a 100-point scale). As a result, for 3 blocks, the student receives 3 grades, which are summed up at the end and divided by 3. For example, if a student receives 80 points for block 1, 65 points for block 2, and 90 points for block 3, the result is 235/3 = 78.3 points. A passing score is considered when a student scores 61 points or higher. A student who scores 61 points or higher will be eligible for the next Section 2 assessment. If a student scores less than 61 points, he must retake the test before the next current assessment.
Upon completion of the study of the sections, the student must pass the "Protocol for evaluating the use of medicines in a supervised patient."