PRIVATE HIGHER EDUCATIONAL INSTITUTION
"INTERNATIONAL ACADEMY OF ECOLOGY AND MEDICINE"
Department of internal medicine with a course in psychiatry and narcology

WORKING PROGRAM
EDUCATIONAL DISCIPLINE

" Clinical pharmacology "

LEVEL OF HIGHER EDUCATION Second (master's) level
DEGREE OF HIGHER EDUCATION Master
FIELD OF KNOWLEDGE 22 Health care
SPECIALTY 222 Medicine

Reviewed and approved
at the meeting of the Academic Council
Protocol No. 1, dated August 31 , 2020

Kyiv 2020

Work program in the discipline " **Clinical pharmacology** " for the preparation of students of the second (master's) higher education level of higher education in specialty 222 Medicine.

Description of the academic discipline:

Name of indicators	Characteristics of the academic discipline	
	Full-time education	
The total number of:	Obov ' I forged	
Credits - 1.0	A year of training	5
Hours - 30	Semester	IX-X
Content subdivisions - 2	Lectures	0
	Practical	20 hours
	Independent work	10 hours
	Including individual tasks	0
	Final control form	Differential calculation

2. The purpose and tasks of the educational discipline

Purpose: training of specialists who possess a sufficient amount of theoretical knowledge and practical skills to carry out the most rational drug therapy for a specific patient, possess the methodology for choosing the most effective and safe drugs, as well as their combinations, taking into account the individual characteristics of the body, the course and form of the disease, the presence concomitant pathology, based on evidence-based medicine data.

The task: providing the student with a sufficient amount of theoretical knowledge and practical skills to carry out the most rational drug therapy for a specific patient, mastering the methodology of individual selection of effective and safe drugs on the basis of pharmacokinetics, pharmacodynamics, possible manifestations of side effects, features of the course of the disease, age of the patient, optimal dosage forms , drawing up rational drug combinations.

The process of studying the discipline is aimed at forming elements of the following competencies :

IR – The ability to solve complex tasks and problems in a certain field of professional activity or in the learning process, which involves conducting research

and/or implementing innovations and is characterized by the complexity and uncertainty of conditions and requirements.

ZK1 – Ability to abstract thinking, analysis and synthesis .
ZK2 – Ability to know and understand the subject area and professional activity .
ZK3 – Ability to communicate in the state language.
ZK4 – Ability to learn and master modern knowledge, use information and communication technologies; the ability to search, process and analyze information from various sources .
ZK5 – Ability to adapt and make a reasoned decision in a new situation.
ZK6 – Ability to work in a team.
ZK8 – Ability to evaluate and ensure the quality of the work performed.
ZK9 – Ability to act on the basis of ethical considerations, socially, responsibly and consciously .

SK1 – Skills of communication and clinical examination of the patient during diagnosis and treatment .
SK2 – Ability to determine the necessary list of clinical laboratory and instrumental studies and evaluate their results during diagnosis and treatment .
SK3 – Ability to establish a preliminary and clinical diagnosis.
SK4 – Ability to determine the principles of treatment, the necessary regime of work and rest, and the nature of nutrition.
SK5 – Ability to determine tactics and provide emergency medical assistance.
SK6 – Ability to keep medical records.

Expected results _ teaching

As a result of studying the academic discipline, the student must:

Known:

- The main ways of pharmacological corrections diseases, disorders functions organs and systems - basic pharmacoeconomic concepts.
- Nomenclature and classification medical means .
- Indications for the implementation of monitored therapy.
- Pharmacological and pharmacotherapeutic characteristics of the main ones groups medical means.
- Indications and contraindications for use medical means.
- Principles for the treatment of pain, including cancer and chronic pain.
- Principles for palliative treatment of terminal patient.

- The basic principles of pharmacotherapy for diseases in the different age-related groups inluding children and elderly patients.
- Manifestations are possible side reactions medical means , symptoms overdose powerful and poisonous medicinal means , methods their warnings and principles treatment _

Be able:

- Write and analyze prescriptions for medicine drugs in different dosage forms in accordance with modern legislation of Ukraine .
- Define group belonging medical means according to modern classifications.
- Analyze the potential adverse reactions of individual medicines and the interactions between them.
- Provide pharmacological and pharmacotherapeutic characteristics of drugs means , logically to connect mechanism actions with pharmacodynamics , pharmacodynamics with indications, and side effects effects with contraindications to them application.
- Calculate a single dose of medicine means of dependence from age , weight bodies or square surface bodies the patient.
- Identify medical problems and prioritize medical management.
- Recognize life-threatening conditions that require immediate medical intervention.
- Determine depending _ from features pharmacokinetics medical means multiplicity reception medicinal means , his per diem , course doses in patients different age according to the accompanying diseases and applications others medical drugs.
- Justify adequate dosage form according to the ways introduction .
- Implement appropriate and safe therapeutic treatment and predict its effects.
- Predict consequences interaction medical means for them combined introduction, medicinal means and components food , medicine drugs and alcohol.
- Evaluate correlation benefit / risk when using medical means.

- Carry out judgment of opportunity occurrence side reactions medical means for their purpose prevention.
- Determine possible manifestations side reactions medical means, symptoms overdose powerful and poisonous medicinal means , methods their warnings and principles treatment.
- Create a help algorithm patients with acute poisoning medicinal means from application antidotes in each specific case.
- Recognize the condition after drinking alcohol, after using drugs and other substances.
- Propose individualization of existing therapeutic guidelines and other methods of treatment in the face of ineffectiveness or contraindications to standard therapy.
- Conduct analysis pharmacological information in modern reference books , scientific and professional periodic editions ;
- Provide comparative characteristics of drugs means by indicators efficiency , safety , mechanism actions , indications for use etc .;
- Assess bedsores and apply appropriate dressings.
- Monitor the condition of a patient poisoned with chemicals or drugs.
- Provide rational pharmacotherapeutic help with the most common urgent conditions that are found in the clinic of internal diseases .
- Cooperate in therapeutic team and inspire the learning process of others.
- Recognize the symptoms of drug dependence and propose treatment.
- Plan own learning activities and constantly learn in order to update own knowledge.

Is ready to:

- *Promote health-promoting behavior.*
- *Perceive and recognize own limitations and self-assessing educational deficits and needs.*
- *Use objective sources of information.*

3. Content of the academic discipline

Subsection 1. General issues of clinical pharmacology.

Topic 1. Subject, problems of clinical pharmacology. Clinical pharmacodynamics , pharmacokinetics of drugs. Subject, tasks, goals of studying clinical pharmacology. Basic concepts of the discipline. Algorithm for the selection of drugs for a specific patient. Basic principles of pharmacodynamics , pharmacokinetics, pharmacotoxicodynamics of drugs.

Unit 2. Applied aspects of clinical pharmacology.

Topic 2. Clinical and pharmacological characteristics of antihypertensive and hypertensive drugs. Treatment of patients.

Principles of treatment of hypertension and symptomatic hypertension. Classification of antihypertensive drugs. Justification of the choice of the drug depending on the stage and degree of arterial hypertension and the type of hemodynamics. Characteristics of first- and second-line drugs. Dosage regime. Comparative characteristics of drugs, in terms of effectiveness, compatibility of drugs with different variants of the course and the presence of concomitant pathology. The choice of the drug and dosage regimen depending on age, presence of pregnancy. Assessment of effectiveness and safety of application. Principles of treatment of hypertensive crises.

Etiopathogenetic principles of arterial hypotension treatment . Classification of hypertensive drugs. Comparative characteristics of drugs, choice of drugs and dosage regime. Assessment of effectiveness and safety of application.

Topic 3. Clinical and pharmacological characteristics of antianginal , antiischemic and hypolipidemic drugs.

Etiopathogenetic principles of treatment of ischemic heart disease. Classification of antianginal drugs. Peculiarities of the choice and combined use of drugs (organic nitrates, beta- adrenergic blockers , calcium channel blockers, sydnonimines). Dosage regime. Indications and contraindications for appointment. Factors that reduce resistance to drugs of this group. Methods of evaluating the effectiveness and safety of application.

Etiopathogenetic principles of treatment of atherosclerosis. Classification of hypolipidemic drugs. Justification of drug selection depending on the class of dyslipidemia . Dosage regime, interaction with other groups of drugs. Assessment of effectiveness and safety of use. Side effect of drugs.

Topic 4. Clinical pharmacology of drugs that affect the ability of blood to clot (thrombolytics , anticoagulants, antiplatelet drugs, coagulants).

Etiopathogenetic mechanisms of increased and decreased ability of blood to clot. Classifications of drugs that are used for the treatment of conditions of increased and decreased thrombus formation. Features of the use of thrombolytics , anticoagulants, antiaggregants , procoagulants . Methods of assessing the effectiveness and safety of their application.

The subject of SRS. Clinical and pharmacological characteristics of cardiac glycosides and non-glycoside positive inotropic drugs, antiarrhythmic drugs.

Etiology and pathogenesis of acute and chronic heart failure. Modern principles of treatment of acute and chronic heart failure. Pharmacokinetics and pharmacodynamics of the main representatives of cardiac glycosides. The role and place of cardiac glycosides in complex therapy of heart failure. Dosage regime. Significance of ECG and echocardiography , clinical control during therapy with cardiac glycosides. Peculiarities of differentiated use of cardiac glycosides and other drugs in chronic heart failure depending on the type of myocardial dysfunction. Intoxication by cardiac glycosides. Non-glycoside and synthetic cardiotonic drugs.

Electrophysiological mechanisms of various disorders of heart rhythm and conduction. Classification of antiarrhythmic drugs. Comparative characteristics of individual pharmacological groups. Peculiarities of the choice of drugs for the treatment of various types of arrhythmia and their preventive therapy. The role of agents affecting electrolyte metabolism, cardiac glycosides in the fight against arrhythmias. Dosage regime. Interaction of antiarrhythmic drugs with each other and with drugs of other pharmacological groups. Assessment of effectiveness and safety of application.

Topic 5. Clinical and pharmacological characteristics of anti-inflammatory drugs (non-steroidal and steroidal).

Modern concepts of pathological physiology and pathological anatomy of inflammation. Classification of anti-inflammatory drugs (steroidal and non-steroidal). Modern ideas about the mechanism of action. Comparative characteristics of the anti-inflammatory effect of drugs. Indications and contraindications for use. Dosage regime. Glucocorticosteroid prescribing schemes . Compatibility of drugs in the combined therapy of diseases. Side effects, methods of monitoring the effectiveness and safety of the use of anti-inflammatory drugs.

Topic 6. Clinical and pharmacological characteristics of antibacterial drugs.

Principles of modern antibacterial therapy. Classification of antibiotics and other antimicrobial drugs. The role of antibiotics and other chemotherapeutic drugs in infectious and purulent-inflammatory diseases. The choice of antibacterial agents in accordance with the sensitivity of microorganisms and the localization of the process, the severity of the disease. Side effects and contraindications to antibacterial therapy. The choice of antimicrobial drugs depending on pharmacokinetics. Age characteristics of antibacterial therapy. Antibiotic resistance and ways to overcome it.

Clinical pharmacology of imidazoles , fluoroquinolones , sulfonamides, nitrofurans .

Topic 7. Clinical and pharmacological characteristics of drugs affecting bronchial patency.

Modern ideas about the etiology and pathogenesis of bronchial obstruction syndrome. Classification of drugs affecting bronchial patency. Pharmacokinetics and pharmacodynamics . Dosage regime. Features of their combined use. Therapeutic effectiveness of beta-2-agonists, M- cholinergic blockers , methylxanthines . The choice of bronchodilator drugs for the relief of an attack of bronchial asthma and the systematic therapy of COPD, including taking into account concomitant pathology. Comparative characteristics of their therapeutic value. Side effects of drugs, advantages and disadvantages of different pharmacological groups. Methods of evaluating the effectiveness and safety of therapy taking into account the degree of bronchial obstruction, sputum viscosity, and the state of central and peripheral hemodynamics.

The subject of SRS. Clinical pharmacology of antiallergic drugs.

Concept of allergy. Types of allergic complications. Classification of antiallergic agents: antihistamines , stabilizers of mast cell membranes, drugs that reduce vascular permeability. Pharmacological effects, dosage principles. Side effects: methods of prevention and treatment. Methods of controlling the effectiveness and safety of application.

The subject of SRS. Clinical pharmacology of psychotropic drugs.

Classification of drugs affecting the functions of the central nervous system. Drugs that stimulate and suppress the function of the central nervous system. Features of clinical application. Dosage regime. Methods of controlling the effectiveness and safety of their use.

Topic 8. Clinical and pharmacological characteristics of drugs affecting the functions of the gastrointestinal tract, hepatobiliary system, and pancreas.

Determination of the principles of pharmacotherapy of peptic ulcer disease of the stomach and duodenum, gastritis, colitis, irritable bowel syndrome, gastroesophageal reflux disease. The value of drugs affecting the secretory function of the stomach (proton pump inhibitors, H_2-histamine blockers, M- choline blockers ; secretory function stimulants). Antihelicobacter therapy (drugs, doses, duration). Gastrocytoprotectors . Medicinal regulation of motility of the gastrointestinal tract. The value of symptomatic drugs: antiemetics and emetics, laxatives and antidiarrheals . Dosage regime. Modern principles of prevention and treatment of intestinal dysbiosis.

Modern principles of treatment of acute and chronic cholecystitis, hepatitis, pancreatitis. Justification of the choice and characteristics of preparations with enzymatic and anti-enzymatic properties. Peculiarities of simultaneous use of drugs. Pharmacokinetics and pharmacodynamics choleretics , cholekinetics , hepatoprotectors , antispasmodics . Indications and contraindications for appointment. Side effect. Dosage regime. Methods of controlling the effectiveness and safety of drug use.

The subject of SRS. Drug interactions. Peculiarities of pharmacotherapy in childhood and old age.

The concept of drug interaction. Types of drug interaction. Positive and negative result of interaction. The concept of combined drugs, polypharmacy.

Concept of pediatric and geriatric pharmacology. Features of the body of children and the elderly that affect the pharmacokinetics and pharmacodynamics of drugs. Methods of controlling the effectiveness and safety of drug use.

Topic 9. Differential calculation. Differential assessment is carried out at the last discipline lesson within 90 minutes. Oral answers to theoretical questions, written solutions and oral justification of situational tasks on the provision of urgent differentiated medical care (choice of a group of drugs, prescriptions for recommended drugs), defense of the student's educational and research work on the analysis of drug pharmacodynamics are offered as the main forms of control of mastery of the discipline

.

Only students who have no academic debt and have an average score for the current educational activity of at least 3.00 are admitted to the final certification. A student's differential credit is assessed on a 4-point (traditional) scale. Final control should be standardized. The average score for the discipline (traditional grade) is calculated as the arithmetic average of the current performance and the grade for the differentiated assessment.

Example: Current academic performance is 4.76; grade on differential assessment - 4.

(4.76+4):2=4.38.

The received grade for the discipline is considered as the percentage of assimilation of the required amount of knowledge in clinical pharmacology.

4. The structure of the study disciplines

Names of sections of the discipline and topics	Number of hours					
	Form of education (full-time)					
	every thing	Including				
		medi cine	Ave	lab	ind	srs
1	2	3	4	5	6	7
Section of discipline 1						
Topic 1. The subject and tasks of clinical pharmacology. Basic principles of pharmacokinetics and pharmacodynamics . Drug interactions, types of side effects, complications of drug therapy.	-	-	2	-	-	20 min.
Together by chapter 1			2			20 min.
Section of discipline 2						
Topic 2. Clinical and pharmacological characteristics of antihypertensive and hypertensive drugs. Curation patients	-	-	2	-	-	1 hour
Topic 3. Clinical and pharmacological characteristics of antianginal , antiischemic and hypolipidemic drugs.	-	-	2	-	-	40 min.
Topic 4. Clinical pharmacology of drugs that affect the ability of blood to clot (thrombolytics , anticoagulants, antiplatelet drugs, coagulants).	-	-	2	-	-	20 min.
The subject of SRS. Clinical and pharmacological characteristics of	-	-	-	-	-	1 hour

cardiac glycosides and non-glycoside positive inotropic drugs, antiarrhythmic drugs.						
Topic 5. Clinical and pharmacological characteristics of anti-inflammatory drugs (non-steroidal and steroidal).	-	-	2	-	-	20 min.
Topic 6. Clinical and pharmacological characteristics of antibacterial drugs.	-	-	4	-	-	40 min.
Topic 7. Clinical and pharmacological characteristics of drugs affecting bronchial patency.	-	-	2	-	-	20 min.
The subject of SRS. Clinical pharmacology of antiallergic drugs.	-	-	-	-	-	1 hour
The subject of SRS. Clinical pharmacology of psychotropic drugs.	-	-	-	-	-	1 hour
Topic 8. Clinical and pharmacological characteristics of drugs affecting the functions of the gastrointestinal tract, hepatobiliary system, and pancreas.	-	-	2	-	-	40 min.
Preparation and writing of the "Protocol of effectiveness and safety of the use of medicinal products"	-	-	-	-	-	2 hours
Topic 9. Final lesson on the subject "Clinical pharmacology" - differential assessment and protection of the protocol	-	-	2	-	-	40 min.
Together by chapter 2	-	-	18	-		9 o'clock 40 min.
Total hours by discipline	-	-	20	-	-	10

5. Topics of lectures

Lectures on the discipline according to the curriculum are not provided.

6. Topics of practical classes

No s/p	Topic	Number hours
1.	Subject, problems of clinical pharmacology. Clinical pharmacokinetics, pharmacodynamics of drugs.	2
2.	Clinical and pharmacological characteristics of antihypertensive and hypertensive drugs. Treatment of patients.	2
3.	Clinical and pharmacological characteristics of antianginal , antiischemic and hypolipidemic drugs.	2
4.	Clinical pharmacology of drugs that affect the ability of blood to clot (thrombolytics , anticoagulants, antiaggregants , coagulants).	2
5.	Clinical and pharmacological characteristics of anti-inflammatory drugs (non-steroidal and steroidal).	2
6.	Clinical and pharmacological characteristics of antibacterial drugs.	4
7.	Clinical and pharmacological characteristics of drugs affecting bronchial patency.	2
8.	Clinical and pharmacological characteristics of drugs affecting the functions of the gastrointestinal tract, hepatobiliary system, and pancreas.	2
9.	Final control of mastery of the discipline - protection of UDRS, differential credit.	2
	Hours in general	20

7. Independent work of students (SRS)

No. z/p	Types of SRS	Number of hours
1.	Preparation for practical classes and final class - differential assessment.	4 hours 40 minutes

2.	Preparation and writing of the "Protocol of the study of drug pharmacodynamics ".	2 hours
3.	Work on topics that are not part of the classroom practical classes: • Clinical pharmacology of cardiotonics (glycoside and non-glycoside) and antiarrhythmic drugs • Clinical pharmacology of antiallergic drugs • Clinical pharmacology of psychotropic drugs • Drug interactions, features of pharmacotherapy in childhood and old age	3 hours 20 minutes
	Together	**1 0**

8. Individual tasks

Not provided.

9. Teaching methods

Practical classes: conversation, solving clinical situational problems, practicing patient examination skills, forming professional abilities and skills in determining the general principles of pharmacokinetics, pharmacodynamics , prescribing, solving typical pharmacotherapeutic problems and test problems, determining whether drugs belong to a pharmacological and pharmacotherapeutic group according to international classification, possible indications for use; analysis and assessment of criteria for the effectiveness and safety of the use of medicines for a certain patient.

Independent work: independent work with the textbook, independent work with the bank of test tasks Step-2, independent solution of clinical and pharmacological tasks.

10. Control methods and criteria for evaluating learning outcomes

Current control: oral survey, testing, assessment of performance of practical skills, solution of situational clinical-pharmacological and pharmacotherapeutic tasks, assessment of activity in class.

Final control : oral differential assessment, testing.

The structure of the current evaluation in the practical lesson :

1. Evaluation of theoretical knowledge on the subject of the lesson:
- methods: survey, solving a situational problem;
- the maximum score is 5, the minimum score is 3, the unsatisfactory score IS 2 .

2. Assessment of practical skills on the topic of the lesson:
- methods: assessment of the correctness of the performance of practical skills
- maximum score – 5, minimum score – 3, unsatisfactory score – 2 ;
3. Evaluation of work with a patient on the subject of the lesson:
- methods: assessment of: a) communicative skills of communication with the patient; b) the correctness of prescribing and evaluating laboratory and instrumental studies in order to control the effectiveness and safety of pharmacotherapy; c) compliance with the algorithm for prescribing pharmacotherapy for a specific patient; d) drawing up a treatment plan.
- maximum score – 5, minimum score – 3, unsatisfactory score – 2 ;

Current assessment criteria for practical training:

"5"	The student is fluent in the material, takes an active part in discussing and solving a situational clinical problem, confidently demonstrates practical skills when working with a patient and interpreting clinical, laboratory and instrumental research data, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
"4"	The student has a good command of the material, takes part in discussing and solving a situational clinical problem, demonstrates practical skills when working with a patient and interpreting clinical, laboratory and instrumental research data with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
"3"	The student does not have sufficient knowledge of the material, takes part in the discussion and solution of a situational clinical problem without confidence, demonstrates practical skills when working with a patient and interpreting the data of clinical, laboratory and instrumental studies with significant errors.
"2"	The student does not master the material, does not take part in the discussion and solution of the situational clinical problem, does not demonstrate practical skills when working with the patient and interpreting the data of clinical, laboratory and instrumental research.

A student is admitted to differential credit provided that he meets the requirements of the educational program and if he received at least 3.00 points for the current educational activity.

The structure of the differential calculation

The content of the evaluated activity	Number
Solving the clinical and pharmacological problem	1
Answers to theoretical questions	1

Criteria for evaluating the learning outcomes of education seekers during differential assessment:

"5"	It is presented to a student who has worked systematically throughout the cycle, has shown versatile and in-depth knowledge of the program material during the differential assessment, is able to successfully perform the tasks provided for in the program, has mastered the content of the main and additional literature, has realized the interrelationship of individual sections of the discipline, their importance for the future profession , showed creative abilities in understanding and using educational program material, showed the ability to independently update and replenish knowledge; the level of competence is high (creative);
"4"	It is awarded to a student who has demonstrated complete knowledge of the curriculum material, successfully completes the tasks provided for by the program, has mastered the basic literature recommended by the program, has shown a sufficient level of knowledge in the discipline and is capable of their independent updating and renewal in the course of further education and professional activity; the level of competence is sufficient (constructive and variable)
"3"	It is issued to a student who has demonstrated knowledge of the main curriculum material in the amount necessary for further education and subsequent work in the profession, copes with the tasks provided for by the program, made some mistakes in the answers during the differential assessment, but has the necessary knowledge to overcome the mistakes made under the guidance of a scientific and pedagogical worker; level of competence - average (reproductive)
"2"	It is issued to a student who has not demonstrated sufficient knowledge of the main curriculum material, has made fundamental mistakes in the performance of the tasks provided for by the program, cannot use the knowledge in further studies without the help of a teacher, has not managed to master the skills of independent work; the level of competence is low (receptive-productive)

11. Distribution of points received by students of higher education

The grade for the discipline consists of 50.0% of the grade for current academic performance and 50.0% of the grade for differential credit.

The average score for the discipline is translated into a national score and converted into points on a multi-point scale.

Table of conversion of a traditional assessment into a multi-point assessment:

National assessment for discipline	The sum of points for the discipline
"5"	**180 - 200**
"4"	**150 - 179**
"3"	**1 20 - 1 49**

Points from the discipline are independently converted to both the ECTS scale and the four-point scale. Points from the ECTS scale are not converted into a four-point scale and vice versa. Further calculations are carried out by the information and computing center of the university.

Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale

Evaluation on the ECTS scale	Statistical indicator
AND	The best 10% of students
IN	The next 25% of students
WITH	The next 30% of students
D	The next 25% of students
IS	The next 10% of students

12. List of questions for differential assessment.

1. Clinical pharmacodynamics , definition, place and role in the choice of pharmacotherapy.
2. Clinical pharmacokinetics, definition, basic concepts, role in the choice of pharmacotherapy.
3. Classification of hypolipidemic drugs.
4. Mechanism of action, pharmacokinetics and pharmacodynamics , indications and contraindications for prescribing statins .

5. Mechanism of action, pharmacokinetics and pharmacodynamics , indications and contraindications for prescribing fibrates .
6. Omega-3 polyunsaturated fatty acids. Mechanism of action. Features of application.
7. Classification of dyslipidemias . A differentiated approach to the use of hypolipidemic drugs.
8. Groups of drugs related to anti-anginal and anti-ischemic drugs.
9. Mechanism of action, pharmacological effects, indications and contraindications for the appointment of nitrates.
10. Mechanism of action, pharmacological effects, indications and contraindications for the appointment of beta- blockers .
11. Mechanism of action, pharmacological effects, indications and contraindications to the appointment of calcium channel blockers.
12. Classification of calcium channel blockers. Features of application. Dosage.
13. Classification of beta- blockers . Features of application. Dosage.
14. Antiplatelet drugs. Classification. Mechanisms of action. Dosing methods.
15. Thrombolytic agents. Indications and contraindications for thrombolysis . Assignment schemes.
16. Anticoagulants. Classification. Mechanisms of action. Adverse events.
17. Principles of drug selection for the treatment of an attack of angina pectoris, acute myocardial infarction.
18. Classification of antihypertensive drugs.
19. A differentiated approach to prescribing antihypertensive therapy in the presence of concomitant diseases (diabetes mellitus, bronchial asthma, pregnancy, advanced age, pheochromocytoma , etc.).
20. Mechanism of antihypertensive action, side effects when prescribing calcium channel blockers. Dosage principles.
21. Mechanism of antihypertensive action, side effects when prescribing beta- blockers . Dosage principles.
22. Mechanism of antihypertensive action, pharmacological effects, indications and contraindications, side effects when prescribing angiotensin-converting enzyme inhibitors. Dosage principles.
23. Mechanism of antihypertensive action, pharmacological effects, indications and contraindications, side effects when angiotensin II receptor antagonists are prescribed. Dosage principles.
24. Principles of combined use of antihypertensive drugs.
25. Differentiated selection of drugs for the treatment of hypertensive crises.
26. Classification of antiarrhythmic drugs.
27. A differentiated approach to prescribing antiarrhythmic drugs.
28. Classification of cardiac glycosides. Dosage principles. Cardiac and non-cardiac effects of cardiac glycosides. Indications for use.
29. Clinical and ECG signs of intoxication with cardiac glycosides. Principles of treatment of intoxication with cardiac glycosides.

30. Differentiated choice of drugs for the treatment of cardiac asthma, pulmonary edema.
31. Non-glycoside positive inotropic drugs. Indications for use.
32. Classification of diuretic drugs.
33. Mechanism of action, pharmacokinetics and pharmacodynamics , indications and contraindications for the appointment of loop diuretics .
34. Mechanism of action, pharmacokinetics and pharmacodynamics , indications and contraindications for the appointment of thiazide and thiazide-like drugs diuretics . Dosage principles.
35. Mechanism of action and pharmacological effects of potassium-sparing drugs diuretics . Indications and contraindications for use. Dosage regimen.
36. A differentiated approach to the choice of a diuretic drug depending on the presence of concomitant diseases (influence on lipid and carbohydrate metabolism).
37. Classification of drugs affecting bronchial patency.
38. Mechanism of action, pharmacokinetics, indications and contraindications for prescribing short-acting beta-2 agonists. Dosage principles.
39. Mechanism of action, pharmacokinetics, indications and contraindications for the appointment of long-acting beta-2 agonists. Dosage principles.
40. Methylxanthines , mechanism of action, pharmacological effects, side effects. Dosage principles.
41. Glucocorticosteroids . Pharmacokinetics and pharmacodynamics . Advantages of using inhaled glucocorticoids . Dosing regimes.
42. Side effects that occur with long-term use of glucocorticosteroids .
43. Mucolytic drugs. Pharmacokinetics and pharmacodynamics . Dosing regimes.
44. Drug interactions. Kinds Clinical examples.
45. Types of side effects when using medicines.
46. Clinical and pharmacological classification of nonsteroidal anti-inflammatory drugs.
47. Mechanism of action, pharmacological effects of nonsteroidal anti-inflammatory drugs.
48. Indications and contraindications. Side effects when using non-steroidal anti-inflammatory drugs, their prevention and treatment.
49. Modern principles of selection of antimicrobial drugs.
50. Adverse effects of antibacterial therapy, their prevention and treatment.
51. Classification, spectrum of activity, mechanism of action, features of clinical use of penicillins. Dosage principles.
52. Classification, spectrum of activity, mechanism of action, features of clinical use of cephalosporins. Dosage principles.
53. Spectrum of activity, mechanism of action, features of clinical use of carbapenems . Dosage principles.
54. Classification, spectrum of activity, mechanism of action, features of clinical use of aminoglycosides . Dosage principles.

55. Classification, spectrum of activity, mechanism of action, features of clinical use of macrolides . Dosage principles.
56. Classification, spectrum of activity, mechanism of action, features of clinical use of fluoroquinolones . Dosage principles.
57. Spectrum of activity, mechanism of action, features of clinical application of glycopeptides . Dosage principles.
58. Spectrum of activity, mechanism of action, features of clinical use of nitroimidazoles and nitrofurans . Dosage principles.
59. Classification of drugs with antisecretory activity.
60. Clinical and pharmacological characteristics of proton pump inhibitors. Dosage principles.
61. Clinical and pharmacological characteristics of H_2 blockers of histamine receptors. Dosage principles.
62. Antacids . Classification, pharmacokinetics and pharmacodynamics . Principles of clinical application and dosage.
63. Hepatoprotectors . Classification. Pharmacokinetics and pharmacodynamics . Indications and contraindications for appointment. Dosage principles.
64. Choleretics and cholekinetics . Clinical and pharmacological features. Indications and contraindications for appointment. Dosage principles.
65. Polyenzyme means of replacement therapy. Pharmacological features. Indications for use. Adverse events. Dosage principles.
66. Anti-enzymatic agents. Classification. Pharmacological features. Indications for use. Dosage principles.
67. Classification, mechanism of action, pharmacokinetics, indications and contraindications for prescribing, side effects of antiallergic drugs. Dosage principles.
68. Modern laboratory methods of diagnosis of coronavirus infection: advantages, informativeness in the choice of pharmacotherapy.
69. The most common symptoms of the infectious and inflammatory process caused by the Covid -19 virus. Instrumental diagnostics.
70. Modern world and state protocols for providing medical care to patients with coronavirus infection, taking into account the main pathogenetic mechanisms of the disease.
71. The main groups of drugs for the pharmacotherapy of coronavirus infection and its complications, their clinical and pharmacological characteristics.
72. Immuno- and vaccine prevention of coronavirus infection. Types of vaccines. Their advantages and disadvantages.

LIST OF PRACTICAL SKILLS, THE ACQUISITION OF WHICH IS CONTROLLED DURING THE DIFFERENTIAL CREDIT "CLINICAL PHARMACOLOGY"

I. Analysis of clinical-pharmacological and pharmacotherapeutic tasks.

II. Prescription rules and the correctness of the prescription form.

III. Assistance in emergency situations:

1. Asthmatic status
2. Acute heart failure
3. An attack of paroxysmal tachycardia
4. Morganyi -Adams-Stokes syndrome
5. Hypertensive crisis
6. Angina attack, acute myocardial infarction
7. Fainting, collapse, shock.
8. Acute allergic reaction
9. Hepatic, renal colic.
10. Gastrointestinal bleeding

13. Methodological support:

- Working program of the academic discipline
- Syllabus of the academic discipline
- Textbooks:
- Clinical pharmacology: Textbook for med. IV accreditation level university . – 2nd edition, revised and supplemented / Ed. O. Ya. Babaka, O. M. Bilovola . - K., 2010. - 776 p.
- Clinical pharmacology: a textbook / Ed. Prof. M. I. Yabluchanskyi , V. M. Savchenko. – Kharkiv: KhNU named after V.N. Karazina , 2011. – 405 p.
- Clinical pharmacology: Textbook for medical universities IV level of accreditation / Ed. O. Ya. Babak , A. N. Bilovol , I. S. Chekman . - K.: Medicine, 2012. - 728 p
- Clinical pharmacology: a textbook for universities / Ed. V.G. Kukesa , D.A. Sycheva. - 6th ed., revised . and additional - M.: GEOTAR-Media, 2017. - 1024 p.
- Multimedia presentations
- Situational clinical-pharmacological and pharmacotherapeutic tasks
- Methodical development of practical classes

- Electronic bank of test tasks by subdivisions of the discipline.

14. RECOMMENDED LITERATURE

MAIN:

1. Clinical pharmacology: Textbook for med. IV accreditation level university . – 2nd edition, revised and supplemented / Ed. O. Ya. Babaka, O. M. Bilovola . - K., 2010. - 776 p.
2. Clinical pharmacology: a textbook / Ed. Prof. M. I. Yabluchanskyi , V. M. Savchenko. – Kharkiv: KhNU named after V.N. Karazina , 2011. – 405 p.
3. Clinical pharmacology: study guide / [E.I.Shorikov , G.I.Shumko, O.S.Kukhlina, etc.]: Vinnytsia: Nova Kniga, 2019. – 512 p.
4. Clinical pharmacology: a textbook / edited by O.M. Bilovola . – Vinnytsia: Nova Kniga, 2021. – 544 p.
5. Clinical pharmacology: Textbook for medical universities IV level of accreditation / Ed. O. Ya. Babak , A. N. Bilovol , I. S. Chekman . - K.: Medicine, 2012. - 728 p
6. A pharmacologist and I in drawings and schemes / V.V. Godovan ; under the editorship V. Y. _ Kresyuna . - Innytsia : New Book, 2019 . - 464 p.

ADDITIONAL:

1. Interaction of drugs and effectiveness of pharmacotherapy / L.V. Derymedved , I.M. Pertsev, E.V. Shuvanova , I.A. Zupanets , V.N. Khomenko; Ed. Prof. I.M. Pertseva . - Kharkiv: Megapolis Publishing House, 2001. - 784 p.
2. Clinical and pharmacological glossary: educational . manual / V.Y. Kresyun , V.V. Godovan , S.B. Strechen . - Odesa: ONMedU , 2015. - 328 p.
3. Clinical pharmacology: Textbook for university students . teach _ app . in 2 volumes / Ed. I.A. Zupantsia , S.V. Nalyotova , O.P. Viktorova. - Kharkiv: Publishing House of the National Academy of Sciences: Golden Pages, 2007. - Volume 1. - 348 p., Volume 2. - 312 p.
4. Kresyun V.Y. Medicinal prescription with general pharmacology: teaching . manual for students of higher educational institutions of the Ministry of Health of Ukraine / V.Y. Kresyun , V.V. Godovan . - 2nd ed., revised . and additional _ - Odesa: ONMedU , 2017. - 280 p.
5. Medicinal toxicology: a textbook / Ed. Drogovoz S.M., Lukyanchuk V.D., Sheiman B.S. - Kh.: Titul, 2015. - 592 p.
6. Emergencies in internal medicine: sub . for honey University / Ed. Baran S.V. - Kyiv, 2015. - 136 p.
7. Basics of internal medicine: sub . for studies _ higher _ teach _ institutions in 2 volumes / V.G. Perederii , S.M. Tkach. – Vinnytsia: New Book, 2009. – T.1. - 640 p., Volume 2. - 784 p.

8. Rational diagnosis and pharmacotherapy of diseases of internal organs / Ed. Prof. O. Ya. Babaka . – 2nd ed., add. – K .: Doktor- Media LLC , 2011. – Volume 1. - 618 p., Volume 2. - 454 p.
9. Directory Sanford on antimicrobial therapy / David N. Gilbert and others; trans. with English under the editorship A.P. Spasokukotskyi - 2nd ed . trans. and additional _ - K.: Ukrainian medical Vestnik , 2013. – 288 p.

15. Electronic information resources and :

1. State Expert Center of the Ministry of Health of Ukraine http://www.dec.gov.ua/index.php/ua/
2. SE " Ukrainian scientific pharmacopoeial quality center medical means " http://sphu.org/
3. National scientific medical library of Ukraine http :// library . gov . u /
4. National library of Ukraine named after V.I. Vernadskyi http :// www . nbuv . gov . u /
5. A resource for predicting drug interactions (based on FDA instructions, in English) URL: http://www.drugs.com
6. Resource-reference book of medicinal products and prediction of drug interactions (in English). URL : http :// www . medscape . org
7. www . studmedlib . ru
8. www . Med - Tutorial . ru
9. Interregional society of evidence-based medicine specialists: http :// www . osdm . org / index . php
10. Herald of evidence-based medicine: http :// www . evidence - update . ru
11. European Society of Clinical Pharmacologists and Pharmacotherapists : http :// www . eacpt . org
12. Drug interaction resource: http :// medicine . iupui _ edu / flockart /

Appendix 1

Protocol for the study of the effectiveness and safety of the use of medicinal products

(according to patient care)

Educational and research work

Student _____

(P.I.B., course, group, faculty)

Head _____

PROTOCOL

study of the pharmacodynamics of the medicinal product _____

Patient (P.I.B., age, body weight) _____

Clinical diagnosis: main disease _____

Complications of the main disease _____

Associated diseases _____

Date of study: from _____ to _____

1. Treatment of the patient (provide the 5 most significant drugs in the form of prescriptions, including those selected for careful analysis)

2. Rationale for the appointment of drugs (international, commercial names, chemical structure, features of administration, pharmacokinetics, pharmacodynamics of drugs)

   _____

   _____

   _____

3. Expected therapeutic effect _____

   _____

   _____

4. Possible side effects _____

   _____

   _____

5. List the signs that will be used to control the therapeutic effectiveness of drugs

   Before treatment After treatment

   Subjective _ _

   A) _____ _____

B) _____ _____

C) _____ _____

D) _____ _____

D) _____ _____

Physical

A) _____ _____

B) _____ _____

C) _____ _____

D) _____ _____

Laboratory and instrumental

A) _____ _____

B) _____ _____

B) _____ _____

D) _____ _____

6. List the symptoms that will be used to control the side effects of drugs

Side effects Presence of a reaction in the patient (yes, no)

Subjective _ _

A) _____ _____

B) _____ _____

C) _____ _____

D) _____ _____

D) _____ _____

Physical

A) _____ _____

B) _____ _____

C) _____ _____

D) _____ _____

Laboratory and instrumental

A) _____ _____

B) _____ _____

B) _____ _____

D) _____ _____

7. Evaluation of combined therapy (consider the possibility of simultaneous prescribing of the drug evaluated with other drugs from section No. 1: pharmacokinetic , pharmacodynamic , pharmaceutical compatibility)_____

_____

8. Conclusions and recommendations (effectiveness of treatment, prognosis of further use, possibility of replacement with other drugs)_____

_____

The study was conducted by_____ The protocol was checked by_____

"Approved"

В.о.Ректора /Acting Rector **Sirhii HRIDCHIN**