



SYLLABUS ON THE EDUCATIONAL DISCIPLINE
CLINICAL PHARMACY AND PHARMACEUTICAL CARE

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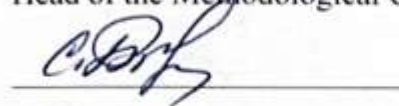
for IV-V years students
for training of specialists of the second (master's) degree of higher education
branch of study 22 «Health Care»
of the specialty 226 «Pharmacy, Industrial Pharmacy»
(full-time education)

Discussed and approved at the meeting of the
Department of Healthcare management,
Pharmacotherapy, Clinical Pharmacy
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Head of the Department



prof. Andriy ZIMENKOVSKY

Approved
by the Methodological Committee of
Chemical and Pharmaceutical Sciences
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Head of the Methodological Committee



prof. Svitlana BILOUS



The Syllabus was developed by:

ZIMENKOVSKY A.B. – DSc, MD, PhD, professor, Head of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

LOPATYNSKA O.I. – PhD, associated professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

STEPANYUK N.G. – DSc, MD, PhD, associated professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

MAKUKH Kh.I. – PhD, associated professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

NASTYUHA Yu.S. – PhD, associated professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

RYVAK T.B. – PhD, assistant professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

KOVAL' A.Ya. – MD, assistant professor of the Healthcare management, Pharmacotherapy, Clinical Pharmacy;

ZAYATS M.M. – PhD, assistant professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

SEH M.Ya. – PhD, assistant professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

GORODNYCHA O.Yu. – PhD, assistant professor of the Department of Healthcare management, Pharmacotherapy, Clinical Pharmacy;

REVIEWER:

KRYCHKOWSKA A.M. – PhD, associated professor of the Department of Technology of Biological Active Substances, Pharmacy and Biotechnology of Lviv Polytechnic National University.

INTRODUCTION

The Syllabus on the a discipline «CLINICAL PHARMACY AND PHARMACEUTICAL CARE» was developed according to the

Professional and Educational Programme «Pharmacy»
Higher Education Standard for the second (master's) degree
branch of study 22 «Health Care»
specialty 226 «Pharmacy, industrial pharmacy»

Description of the academic discipline (summary). «Clinical Pharmacy and Pharmaceutical Care» belongs to the cycle of fields of professional training of students of specialty 226 «Pharmacy, industrial pharmacy». The Syllabus plays the preliminaries for the pharmacist's involvement in the delivery of rational pharmacotherapy and qualitative pharmaceutical care provision.

Structure of the educational discipline	Number of credits, hours, including				Year of study semester	Type of control
	Total	Classroom		Self-study		
		Lectures (hours)	Practical classes (hours)			
«Clinical Pharmacy and Pharmaceutical Care»	9 credits / 270 hours	20	115	135	IV year (VII semester) IV year (VIII semester) V year (IX semester)	Credit Exam
According to the semesters						
«Clinical Pharmacy and Pharmaceutical Care»	3 credits / 90 hours	10	32	48	IV year (VII semester)	
«Clinical Pharmacy and Pharmaceutical Care»	3 credits / 90 hours	10	38	42	IV year (VII semester)	Credit
«Clinical Pharmacy and Pharmaceutical Care»	3 credits / 90 hours		45	45	V year (IX semester)	Exam

The subject matter of the academic discipline is to study the principles of rational use of medicines (drugs).

Interdisciplinary connections. The study of the educational discipline «Clinical Pharmacy and Pharmaceutical Care» is based on the subjects of the natural-scientific direction. They include: «Anatomy», «Physiology», «Biology with basics of genetics», «Information Technologies in Pharmacy», «Microbiology with basics of immunology», «Ethics and Deontology in Pharmacy», «Pathological Physiology» and the professionally directed disciplines as follows: «Pharmacology», «Pharmacotherapy with Pharmacokinetics», «Technology of Drug Preparation», «Organization and Economics in Pharmacy».

1. The course goal and objectives of the educational discipline.

1.1. The course teaching goal in «Clinical Pharmacy and Pharmaceutical Care» is to form the theoretical knowledge and practical skills of students for the pharmacotherapy optimization through control of the rational drugs use and safety of pharmacotherapy, prevention of the drug-related problems (DRPs) and polypharmacy, and also provision of the specialist professional services,

particularly the patient-directed pharmaceutical care, required for the safe and effective pharmacotherapy.

1.2. The main course learning objectives in «Clinical Pharmacy and Pharmaceutical Care» are as follows:

- Study and mastering the symptoms and syndromes of the most widespread clinical conditions;
- Study of the main signs of disorders that are treated with the over-the-counter (OTC) medicines within the concept of responsible self-medication;
- Mastering the main principles of symptomatic pharmacotherapy of disorders and pathological conditions where the responsible self-medication is possible;
- Mastering the principles and skills of pharmaceutical care of patients provision during the OTC and prescription medicines dispensing;
- Studying the signs and symptoms that require the physician's intervention;
- Studying the general principles of diagnostics and differential diagnostics of the disorders of the internal organs;
- Mastering the general principles of the examination results interpretation;
- Identification, control, and implementation of the appropriate pharmacotherapy plan adapted to the needs of the particular patient, taking into account the condition of the body and the properties of medicines;
- Studying the risk factors and clinical signs of the adverse drug reactions (ADRs); mastering the main approaches to the ADRs prevention in the individual patients
- Studying the main principles of combined medicines use and prevention of the undesirable outcomes of drug interactions;
- Mastering the safety and efficacy evaluation in the use of some special pharmacological groups or certain medicines;
- Mastering skills of finding, obtaining, analyzing, interpreting and presenting evidence-based information about medicines;
- Mastering principles of medical deontology, ethical standards of behavior of a pharmacist in healthcare settings in cooperation with physicians, pharmacists, clinical pharmacists, nursing staff, patients, and their relatives.

1.3 Competencies and learning outcomes, the formation of which is facilitated by the discipline (the relationship with the regulatory content of the higher education applicant's professional training, formulated in terms of study results in the Standard of Higher Education).

The course provides the students' competences according to the requirements of the High education standard:

– **integral:**

The ability to apply the acquired general and professional competencies to solve complex problems in professional pharmaceutical activities, including those of a research and innovation nature; realization of professional activities by the relevant position, including the manufacture/development of drugs, their storage, quality control, delivery, distribution, dispensing, and supplying of drugs, as well as consulting, providing information on drugs, and monitoring side effects and/or ineffectiveness of drug therapy; implementation of innovations.

– **general:**

GC 1. *The ability to abstract thinking, analysis and synthesis.*

GC 2. *The knowledge and understanding of the subject and profession.*

GC 3. *Ability to communicate in the national language both orally and in writing.*

GC 4. *The ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity.*

GC 5. *The ability to assess and ensure the quality of work.*

GC 6. *The ability to a teamwork.*

GC 8. *The ability to save and increase moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society, and the development of society, techniques and technology, to use different types and forms of physical activity for active recreation and a healthy lifestyle.*

GC 9. *The ability to apply information and communication technologies.*

– **special:**

SC 1. *The ability to integrate knowledge and solve complex pharmacy/industrial pharmacy problems in broad or multidisciplinary contexts.*

SC 3. *The ability to solve pharmacy problems in new or unfamiliar conditions with incomplete or limited information, taking into account aspects of social and ethical responsibility.*

SC 4. *The ability to clearly and unambiguously convey one's own knowledge, conclusions, and arguments in the pharmacy field to specialists and non-specialists, in particular to people who are learning.*

SC 5. *The ability to demonstrate and apply communication skills and fundamental principles of pharmaceutical ethics and deontology in practical activities.*

SC 7. *The ability to conduct sanitary and educational work among the population to prevent common diseases, dangerous infections, viruses and parasitic diseases, as well as to promote the timely determination and maintenance of adherence to the treatment of these diseases according to their medical-and-biological characteristics and microbiological properties.*

SC 8. *The ability to provide rational use and consulting concerning prescription and OTC medicines and other pharmaceutical products, pharmaceutical care when choosing and dispensing of medicines by the evaluation of risk/benefit correlation, compatibilities, in accordance with their biopharmaceutical, pharmacokinetic, pharmacodynamics and physicochemical and chemical properties, indications/contraindications, based on the health condition of a certain patient.*

SC 9. *The ability to provide first aid for patients and victims in extreme situations and emergencies.*

SC 10. *The ability to monitor the effectiveness and safety of the drug use based on their clinical and pharmaceutical characteristics.*

SC 15. *The ability to analyze the socio-economic processes in pharmacy, forms, methods and functions of the pharmaceutical supply system and its components in the world practice, indicators of need, efficiency and availability of pharmaceutical care in terms of healthcare insurance and reimbursement of the drugs.*

The Competence Matrix

No	Competences	Knowledge	Skills	Communication	Autonomy and responsibility
		<p>Kn 1. Specialized conceptual knowledge, which includes current scientific achievements in professional activity or field of expertise, is the basis for original thinking and research conducting, critical understanding of problems in the branch, and on the border of areas of knowledge.</p>	<p>Sk 1. Specialized problem-solving skills are required for conducting research and/or implementing innovative activities to develop new knowledge and procedures.</p> <p>Sk 2. The ability to integrate knowledge and solve complex problems in broad, multidisciplinary</p>	<p>C 1. Clear and unambiguous conveying one's knowledge, conclusions, and arguments to specialists and non-specialists, particularly those learning.</p>	<p>AR 1. Managing work or learning processes that are complex, unpredictable, and require new strategic approaches.</p> <p>AR 2. Responsibility for the contribution to professional knowledge and practice and/or evaluation of the results of the activities of teams and</p>

			contexts. Sk 3. The ability to solve problems in new or unfamiliar conditions with incomplete or limited information, taking into account aspects of social and ethical responsibility.clear		collectives. AR 3. Ability to continue learning with a high degree of autonomy.
<i>Integrative competency</i>					
The ability to apply the acquired general and professional competencies to solve complex problems in professional pharmaceutical activities, including those of a research and innovation nature; realization of professional activities by the relevant position, including the manufacture/development of drugs, their storage, quality control, delivery, distribution, dispensing, and supplying of drugs, as well as consulting, providing information on drugs, and monitoring side effects and/or ineffectiveness of drug therapy; implementation of innovations.					
<i>General competences</i>					
GC 1.	The ability to abstract thinking, analysis and synthesis.		Sk 2		
GC 2.	The knowledge and understanding of the subject and profession.	Kn 1	Ks 1		
GC 3.	Ability to communicate in the national language both orally and in writing			C 1	
GC 4.	The ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity			C 1	
GC 5.	The ability to assess and ensure the quality of work.	Kn 1	Sk 1 Sk 2 Sk 3	C 1	AR 1 AR 2 AR 3
GC 6.	The ability to a teamwork.		Sk 3	C 1	AR 1 AR 2
CG 8.	The ability to save and increase moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society, and the development of society, techniques and technology, to use different types and forms of physical activity for active recreation and a healthy lifestyle.		Sk 3	C 1	AR 3

GC 9.	The ability to apply information and communication technologies.		Sk 1		Sk 1
<i>Special competencies in the profession</i>					
SC 1.	The ability to integrate knowledge and solve complex pharmacy/industrial pharmacy problems in broad or multidisciplinary contexts.	Kn 1	Sk 1 Sk 2		AR 1 AR 2
SC 3.	The ability to solve pharmacy problems in new or unfamiliar conditions with incomplete or limited information, taking into account aspects of social and ethical responsibility.		Sk 3		AR 1 AR 2
SC 4.	The ability to clearly and unambiguously convey one's own knowledge, conclusions, and arguments in the pharmacy field to specialists and non-specialists, in particular to people who are learning	Kn 1	Sk 1	C 1	AR 1 AR 2
SC 5.	The ability to demonstrate and apply communication skills and fundamental principles of pharmaceutical ethics and deontology in practical activities.			C 1	
SC 7.	The ability to conduct sanitary and educational work among the population to prevent common diseases, dangerous infections, viruses and parasitic diseases, as well as to promote the timely determination and maintenance of adherence to the treatment of these diseases according to their medical-and-biological characteristics and microbiological properties.	Kn 1	Sk 2	C 1	AR 2

SC 8.	The ability to provide rational use and consulting concerning prescription and OTC medicines and other pharmaceutical products, pharmaceutical care when choosing and dispensing of medicines by the evaluation of risk/benefit correlation, compatibilities, in accordance with their biopharmaceutical, pharmacokinetic, pharmacodynamics and physicochemical and chemical properties, indications/contraindications, based on the health condition of a certain patient.	Kn 1	Sk 1 Sk 2 Sk 3	C 1	AR 1 AR 2
SC 9.	The ability to provide first aid for patients and victims in extreme situations and emergencies.	Kn 1	Sk 1		AR 2
SC 10.	The ability to monitor the effectiveness and safety of the drug use based on their clinical and pharmaceutical characteristics.	Kn 1	Sk 1 Sk 2 Sk 3	C 1	AR 1 AR 2 AR 3
SC 15.	The ability to analyze the socio-economic processes in pharmacy, forms, methods and functions of the pharmaceutical supply system and its components in the world practice, indicators of need, efficiency and availability of pharmaceutical care in terms of healthcare insurance and reimbursement of the drugs.	Kn 1	Sk 1 Sk 2 Sk 3		AR 1 AR 2

The learning outcomes:

The discipline facilitates the formation of integrative and program learning outcomes:

Identification of future professional activities as socially significant for human health. Application of knowledge from general and special disciplines in professional activity. Compliance with the

sanitary regimen and safety requirements in the professional activity. Using the results of independent search, analysis, and synthesis of information from various sources to solve typical tasks of professional activity. The reasoning of data for decision-making, responsibility for the decisions in standard and non-standard professional situations, adherence to the principles of deontology, and ethics in professional activity. Performing professional action using creative methods and approaches. Professional communication in modern literary language, oral communication skills in a foreign language. Performing professional activities using information technologies, databases, navigation systems, Internet resources, software, and other information and communication technologies. Compliance with the standards of communication in professional interaction with colleagues, management, consumers, and effective teamwork.

The results of studying of «Clinical Pharmacy and Pharmaceutical Care» are:

- PR 1. To possess specialized conceptual knowledge in the pharmacy field and related areas, taking into account current scientific achievements and to be able to apply it in professional activities.
- PR 2. Critically comprehend and analyze scientific and applied problems in the pharmacy field.
- PR 3. To possess specialized knowledge and abilities/skills for solving professional problems and tasks, including improving knowledge and procedures in the pharmacy field.
- PR 4. To communicate freely in the national and English languages orally and in writing to discuss professional problems and activity results, presentation of scientific research, and innovative projects.
- PR 5. To assess and ensure the quality and effectiveness of pharmacy activities in standard and non-standard situations; to adhere to the principles of deontology and ethics in professional activity.
- PR 6. To develop and make effective decisions to solve complex pharmacy problems personally and based on the results of joint discussion; to formulate the goals of one's activity and the team activity, taking into account public and industrial interests, the general strategy and existing limitations, determine the optimal ways to achieve goals.
- PR 8. To develop and implement innovative projects in the pharmacy field, as well as related interdisciplinary projects, considering technical, social, economic, ethical, legal, and environmental aspects.
- PR 9. To formulate, make an argument, and clearly and concretely convey to specialists and non-specialists, including students, information based on one's own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.
- PR 10. To carry out sanitary-educational work in professional activity for prevention and in case of outbreaks of infectious, viral and parasitic diseases.
- PR 11. To determine the advantages and disadvantages of medicines of natural and synthetic origin of various pharmacological groups, considering their chemical, physical-and-chemical, biopharmaceutical, pharmacokinetic, and pharmacodynamic features. To recommend over-the-counter drugs and other pharmaceutical products for patients and provide consultation and pharmaceutical care.
- PR 12. To provide first aid to patients in emergencies and victims in extreme situations.
- PR 13. To record cases of side effects when using medicines of natural and synthetic origin; to evaluate factors that can affect the processes of absorption, distribution, deposition, metabolism, and excretion of drugs and are determined by the condition and characteristics of the human body and the pharmaceutical aspects of medicines.
- PR 24. To apply the results of the clinical, laboratory, and instrumental investigations for monitoring the effectiveness and safety of drug use.
- PR 26. To plan and implement professional activity based on normative legislation of Ukraine and recommendations of good pharmaceutical practices.
- PR 27. To promote good health, including disease prevention, rational prescribing and use of medicines.

2. Informational scope of the educational discipline

9.0 ECTS credits (270 hours) are allocated for academic discipline.

Content module 1. Objects and tasks of clinical pharmacy. Concept of pharmaceutical care. Evidence-based medicine as one of the main tools for ensuring the rationality of pharmacotherapy. Clinical trials of medicines.

Specific goals:

- to know the main tasks of clinical pharmacy;
- to be able to interpret the current meaning of the following terms: «pharmaceutical care», «evidence-based pharmaceutical care», «evidence-based medicine», «evidence-based pharmacy», «patient's drug behavior», «compliance», «adherence»;
- to be able to justify the role of factors affecting the effectiveness and safety of medicines;
- to know the levels of evidence and justify their relevance in pharmacotherapy;
- to know the principles of the evidence-based search for information on medicines;
- to be able to search for information about medicines in evidence-based databases;
- to gain the skills of providing pharmaceutical care to the pharmacy visitors and the information work.
- to know the principles of conducting the clinical trials of medicines;
- to interpret the results of bioavailability and bioequivalence of a drug investigation.

Topic 1. The subject and main tasks of clinical pharmacy. The fundamentals of pharmaceutical care. Medication-taking behavior of the patient. Features of pharmaceutical care in ensuring and maintaining a high level of adherence.

The meaning of clinical pharmacy and its tasks. The correlation of clinical pharmacy with the related disciplines. The role of clinical pharmacy in the system of pharmaceutical education. The World experience of clinical pharmacy development. Ethics and deontology in medicine and pharmacy. Deontological aspects of the pharmacist-physician, pharmacist-patient, pharmacist-pharmacy visitor relationships. The pharmacist's role in providing rational pharmacotherapy, upgrading its efficacy and safety. Management of the patient's drug-related behavior. Compliance and adherence as the components of the patient's drug-related behavior.

Topic 2. Evidence-based medicine as a tool for ensuring the rationality of pharmacotherapy. The principle of drug choosing for pharmacotherapy.

The structure of the systematic review. Evidence-based databases. Principles of evidence-based information retrieval. Levels of evidence. Evaluation of the effectiveness and safety of medicines from the standpoint of evidence-based medicine.

Topic 3. The role of the pharmacist in clinical trials of medicines. Bioavailability and bioequivalence of drugs assessment. Correlation of the in vitro - in vivo methods.

The principles of conducting the clinical trials of drugs. The regulatory documents for conducting clinical trials of medicines. Rules for planning and conducting clinical trials. Information support for the clinical research process of medicines. Assessment of bioequivalence and bioavailability of medicines. Interpretation of clinical trial results.

Content module 2. Alteration of the pharmacotherapeutic effect of medicines when using drug combinations. Side effects and adverse drug reactions. Drug-induced disorder.

Specific goals:

- to be able to justify changes in the pharmacotherapeutic effect of medicines when using drug combinations;
- to know the classification of adverse drug reactions (ADRs), peculiarities of their manifestation;

- be able to explain terms, such as «adverse drug reaction», «side-effect», «drug-related problem»;
- be able to prevent the ADRs;
- to know principles of correction of the ADRs;
- evaluate the chances for drug-induced disorder development in case of medicine use.

Topic 4. Drug interactions, principles of their classification. Pharmaceutical care aims to prevent the undesirable consequences of drug interactions.

Principles of combining medicines in pharmacotherapy. Rational and irrational drug combinations. Changes in drug in case of combining pharmacokinetics and pharmacodynamics when using combined pharmacotherapy. Changes in pharmacotherapeutic effects of medicines when using combined pharmacotherapy. Principles of drug interactions prevention for their rational use. Interactions of drugs with food, alcohol, and nicotine.

Topic 5. Adverse drug reactions and side effects. Types of ADRs, risk factors for their occurrence, and clinical manifestations. Pharmacovigilance system. Drug-induced disorders as a result of irrational use of medicines.

Classification of adverse drug reactions. Types of adverse drug reactions and their clinical features. Factors that determine ADRs while using medicines. Principles of ADRs prevention. Correction of ADRs. System of Pharmacovigilance. Drug-induced disorder, its specifics, clinical signs, prevention. Principles of irrational drug use prevention.

Content module 3. Fundamentals of rational medicines use in different age groups of patients. Evaluation of efficacy and safety of medicines in different clinical conditions.

Specific goals:

- to evaluate the changes in pharmacokinetics and pharmacodynamics depending on the age and gender of the patient;
- to know the rules of medicine use in patients with kidney and liver disorders;
- to be able to evaluate the safety and efficacy of medicines in pediatric practice;
- to justify the feasibility and rationality of medicines application y in elderly patients;
- to know the principles of rational use of medicines during pregnancy and lactation.

Topic 6. Clinical-and-pharmacological approaches to the use of medicines during pregnancy and lactation. The role of pharmaceutical care in rational pregnancy management.

Physiological and biochemical changes of the female body during pregnancy and breastfeeding and their influence on drug pharmacokinetics and pharmacodynamics. Principles of use of medicines during pregnancy and lactation. Assessment of drug safety and efficacy during pregnancy and lactation. Teratogenic, embryotoxic and fetotoxic effects of medicines. Pharmaceutical care of pregnant and lactating women.

Topic 7. Clinical-and-pharmacological approaches to the use of medicines in pediatrics and neonatology. Pharmaceutical care of neonates and children of different age groups. Specifics of pharmaceutical care in pediatrics and neonatology for physicians, nursing staff, patients, and their relatives.

Physiological and biochemical peculiarities of the child's body. Specifics of pharmacokinetics and pharmacodynamics in pediatrics. Principles of drug use in children of different age groups. Assessment of drug safety and efficacy in pediatrics. Factors determined rational drug and dosage form selection in pediatrics. Pharmaceutical care in pediatrics and neonatology.

Topic 8. Principles of clinical-and-pharmaceutical approach to rational medicines use in geriatrics. Peculiarities of pharmaceutical care of elderly patients.

Age specifics of physiological and biochemical processes in the body of elderly patients. Specifics of pharmacokinetics and pharmacodynamics for elderly patients. Principles of medicines use in geriatrics. Assessment of drug safety and efficacy in geriatrics. Factors determined rational drug and dosage form selection in geriatrics. Pharmaceutical care in geriatrics.

Content module 4. Fundamentals of rational self-medication. Pharmaceutical care when dispensing OTC medicines.

Specific goals:

- to know principles of rational and safe self-medication;
- to know basic statements of the current regulatory judicial framework for self-medication OTC medicines use;
- to gain the skills of dangerous and life-threatening symptoms of the gastrointestinal, nervous system, skin, and local circulatory disorders that can treat with the use of self-medication;;
- to master the clinical-and-pharmaceutical characteristics of the OTC medicines for symptomatic treatment of the gastrointestinal, nervous system, skin, and local circulatory disorders;
- master the algorithm of the pharmacist's actions when selecting the OTC medication for symptomatic treatment of the gastrointestinal, nervous system, skin, and local circulatory disorders.

Topic 9. Responsible self-medication, current regulatory judicial framework for its provision. Participation of the pharmacist in responsible self-medication. OTC-medications, principles of their choice for self-medication of the gastrointestinal disorders and local circulatory disorders. Pharmaceutical care.

Prescription and over-the-counter medications. Regulatory judicial framework for self-medication. Principles of responsible self-medication and the role of the pharmacist in it.

The directions and means of symptomatic pharmacotherapy of disorders. The main signs and symptoms of GI disorders (heartburn, constipation, diarrhea, flatulence, dysbiosis) and local circulatory disorders (varicose veins of the lower extremities, hemorrhoids) can be treated with OTC medicines as responsible self-medication. Life-threatening symptoms required obligatory physician's intervention.

Algorithm of the pharmacist's actions when providing pharmaceutical care for OTC medicines.

Contemporary dosage forms and peculiarities of their use.

Interactions of the OTC medicines for symptomatic pharmacotherapy with food, and alcohol; peculiarities of their use in a different age; requirements to the storage of medicines at home.

Criteria for the efficacy of pharmacotherapy with the OTC medicines. Non-pharmacological methods of symptom elimination.

Topic 10. Conditions for self-medication. OTC-medicines, their selection for self-medication in case of cold, cough, rhinitis, the pain of different origin, fever. Pharmaceutical care.

The main symptoms of colds (cough, rhinitis, sore throat, fever, etc.) allow using of OTC medicines within responsible self-medication.

Skin lesions: microtraumas (cuts, abrasions, scratches), thermal and chemical damage to the surface layers of the skin (burns, frostbite), acne, infectious damage (cold sores, mycoses, scabies, pediculosis), seborrhea. OTC medicines are allowed under responsible self-medication.

«Dangerous» symptoms required obligative medical intervention.

An algorithm for providing a pharmacist with proper information about an over-the-counter drug within the scope of pharmaceutical care.

Modern dosage forms and features of their use.

Interaction of OTC medicines used for symptomatic treatment with food, alcohol; peculiarities of their use in different ages; requirements for storage of medicines at home.

Performance criteria for over-the-counter pharmacotherapy. Non-pharmacological methods of elimination of symptoms.

Topic 11. Conditions for self-medication. OTC-medicines, their selection for self-medication of the local circulatory disorders, acne, burns, scabies, traumatic skin disorders, wounds, etc. Pharmaceutical care.

Skin lesions: microtraumas (cuts, abrasions, scratches), thermal and chemical damage to the surface layers of the skin (burns, frostbite), acne, infectious damage (cold sores, mycoses, scabies, pediculosis), seborrhea. OTC medicines are allowed under responsible self-medication.

An algorithm for providing a pharmacist with proper information about an over-the-counter drug within the scope of pharmaceutical care.

Modern dosage forms and features of their use.

Interaction of OTC medicines used for symptomatic treatment with food, alcohol; peculiarities of their use in different ages; requirements for storage of medicines at home.

Performance criteria for over-the-counter pharmacotherapy. Non-pharmacological methods of elimination of symptoms.

Content module 5. Fundamentals of antibacterial, antiviral, and antifungal medicines use.

Specific goals:

- to know the classification and clinical-and-pharmaceutical characteristics of different classes of antibacterial, antiviral, and antifungal medicines;
- to know signs and symptoms of the disorders when the use of antibacterial, antiviral, and antifungal medicines is approved;
- be able to evaluate the efficacy and safety of antibacterial, antiviral, and antifungal medicines.

Topic 12. Clinical-and-pharmaceutical approaches to antibacterial agents use.

Clinical pharmacology of antimicrobials (Penicillins, Cephalosporins, Carbapenems, Macrolides, Fluorchinolones, Tetracyclines, Aminoglycosides, Lincosamides, Glycopeptide antibiotics, Chloramphenicols).

Specifics of the pharmacokinetics of antibiotics of different pharmacological and chemical groups.

ADRs of antibiotics. Specific ADRs of antibiotics of different pharmacological and chemical groups. Prediction, clinical presentation, prevention, and treatment.

Selection of the optimal route, dosage, and regimen of administration.

Topic 13. The role of pharmaceutical care in rational antibiotic pharmacotherapy.

Approaches to the rational selection of antibiotics for different infectious diseases. Principles of antibiotic pharmacotherapy. Prevention of antibiotic resistance.

Factors that influence the clinical efficacy of antibiotics.

Pharmaceutical care for antibiotics use.

Combined antibiotic pharmacotherapy. Interactions of antibiotics and other groups of medicines.

Topic 14. Clinical-and-pharmaceutical approaches to antiviral medicines use. Pharmaceutical care.

The conditions needed to treat with antiviral medicines. Classification of the antiviral medications. Clinical-and-pharmaceutical characteristics of antiviral drugs. Assessment of efficacy and safety of antiviral therapies.

Structure and functions of the immune system. Active and passive immunization. Sepsis, septic shock. Medicines for the pharmacotherapy of sepsis, septic shock. Features of medications in sepsis. Vaccination. Types of vaccines.

Topic 15. Clinical-and-pharmaceutical approaches to antifungal medicines use. Pharmaceutical care.

The conditions needed to treat with antifungal medicines. Classification of the antifungal medicines. Clinical-and-pharmaceutical characteristics of antifungal medicines. Assessment of efficacy and safety of antifungal medicines.

Content module 6. Clinical-and-pharmaceutical approaches to medicines use for respiratory, ENT, and allergic disorders.

Specific goals:

- to master main symptoms and syndromes of allergic disorders;
- to master approaches to pharmacotherapy of allergic disorders;
- to master clinical-and-pharmacological characteristics of modern medicines for the treatment of allergic disorders;;
- to be able to identify appropriate dosage forms of medicines for allergic disorders treatment;
- to be able to identify dosage forms, routes and regimens of administration of medicines;
- to be able to identify criteria of safety and efficacy of the selected pharmacotherapy;
- to master main symptoms and syndromes of respiratory and ENT-disorders;
- to be able to identify symptoms that can treat with self-medication;
- to master approaches to pharmacotherapy of respiratory and ENT-disorders;
- to master clinical-and-pharmaceutical characteristics of modern medicines for the pharmacotherapy of respiratory and ENT-disorders;
- to be able to identify appropriate drugs for respiratory disorders pharmacotherapy;
- to be able to identify efficacy and safety criteria for pharmacotherapy.

Topic 16. Clinical-and-pharmaceutical approaches to the treatment of allergic disorders. Systemic allergic reactions. The role of pharmaceutical care in the prevention and treatment of allergic reactions.

Meaning of allergy and mechanisms of allergic reactions. Types of allergy (immediate and delayed type). Factors causing allergy predisposition.

Clinical manifestations of allergy and basic principles of drug treatment.

Etiology, pathogenesis, clinical signs, directions of pharmacotherapy of urticaria, Quincke's edema, anaphylactic and anaphylactoid shock, Lyell's and Stevens-Johnson syndromes.

Modern antiallergic medicines, advantages and disadvantages of some generations, principles of rational choice. Drugs for anaphylactic shock reduction, their application.

Topic 17. Clinical-and-pharmaceutical approaches to the treatment of allergic disorders. Local allergic reactions. The role of pharmaceutical care in the prevention and treatment of allergic reactions.

Clinical manifestations of allergy and basic principles of drug treatment.

Food and drug allergy. Specifics of clinical syndromes and pharmacotherapy.

Allergology anamnesis, it's meaning for the rational medicines selection for pharmacotherapy.

Modern antiallergic medicines, advantages and disadvantages of some generations, principles of rational choice. Drugs for anaphylactic shock reduction, their application.

Topic 18. Clinical-and-pharmaceutical approaches to treating ENT-disorders (acute and chronic tonsillitis, pharyngitis, laryngitis, sinusitis, otitis). The role of pharmaceutical care in the rational use of medicines.

The main signs of diseases of ENT-organs. Clinical symptoms and features of tonsillitis, pharyngitis, laryngitis, and sinusitis. Approaches to the rational choice of medicines. Clinical-and-pharmaceutical characteristics of major groups of drugs. Combined medication use for the ENT-diseases; interaction with other pharmacotherapeutic groups.

ADRs of medicines for the treatment of ENT-disorders. Prediction, clinical manifestations, prevention and ways of reduction.

Efficacy and safety criteria for pharmacotherapy.

Topic 19. Pharmaceutical care of patients with bronchial asthma.

Clinical signs and features of bronchial asthma. Approaches to pharmacotherapy. Clinical-and-pharmaceutical characteristics of major groups of medicines. Interactions with other pharmacotherapeutic groups. Side effects of medications used for the treatment of bronchial asthma. Prediction, clinical manifestations, prevention and medicines.

Modern unique dosage forms are used in treating bronchial asthma, and their clinical and biopharmaceutical features, rules, and conditions for rational use. Efficacy and safety criteria for pharmacotherapy.

Topic 20. Clinical-and-pharmaceutical approaches to treating respiratory organs (bronchitis, respiratory failure). The role of pharmaceutical care in the rational use of medicines.

Symptoms and syndromes of respiratory diseases: cough, shortness of breath (dyspnea), chest pain, fever, cyanosis, bronchial obstruction syndrome, and respiratory failure syndrome.

Clinical signs and symptoms of bronchitis and respiratory failure. Approaches pharmacotherapy of bronchitis and respiratory failure. Clinical-and-pharmaceutical characteristics of the main groups of medicines. Efficacy and safety criteria for pharmacotherapy.

Topic 21. Clinical-and-pharmaceutical approaches to treating respiratory organs diseases (pneumonia, lung tuberculosis). The role of pharmaceutical care in the rational use of medicines.

Clinical signs and symptoms of pneumonia and lung tuberculosis. Approaches pharmacotherapy for pneumonia and lung tuberculosis. Clinical-and-pharmaceutical characteristics of the main groups of medicines. Efficacy and safety criteria for pharmacotherapy.

Content module 7. Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of gastrointestinal tract disorders..

Specific goals:

- to master the main symptoms and syndromes of gastrointestinal disorders;
- to be able to identify the symptoms for responsible self-medication;
- to master approaches pharmacotherapy of gastrointestinal disorders;
- to master clinical-and-pharmacological characteristics of the modern medicines that are used for gastrointestinal disorders pharmacotherapy;
- to be able to identify the optimal medications for gastrointestinal tract disorders pharmacotherapy;
- to be able to identify the dosage forms, routes and regimen of administration of medicines;
- to be able to identify the safety and efficacy criteria of the selected pharmacotherapy;
- to be able to provide pharmaceutical care for gastrointestinal tract disorders pharmacotherapy.

Topic 22. Pharmaceutical care for patients with gastrointestinal disorders (gastritis, gastroenteritis, colitis, enteritis). Clinical-and-pharmaceutical approaches for medicines selection.

Symptoms and syndromes of the main gastrointestinal disorders.

Approaches to pharmacotherapy of the gastrointestinal tract disorders.

Approaches to rational choice of medicines for the treatment of gastrointestinal tract disorders.

Combined pharmacotherapy for gastrointestinal tract disorders; interaction with other pharmacotherapeutic groups. Features of the use of medications in gastroenterology in the presence of concomitant pathology. Drugs with toxic effects on the condition of the gastrointestinal tract. Influence of the functional state of the stomach and intestines on the clinical efficacy of medicines.

Side effects of medicines used in diseases of the stomach and intestines. Prediction, clinical manifestations, and prevention.

Modern special dosage forms used for diseases of the stomach and intestines (suspensions, gels for oral administration, tablets for chewing, capsules with mini spheres, etc.), their clinical and biopharmaceutical features, rules and conditions of rational use.

Efficacy and safety criteria for pharmacotherapy in gastroenterology.

Principles of pharmaceutical care for patients with gastric and intestinal diseases.

Topic 23. Pharmaceutical care for patients with peptic ulcer. Clinical-and-pharmaceutical approaches for medicines selection.

Symptoms and syndromes of the peptic ulcer.

Complications of diseases of the gastrointestinal tract: bleeding, penetration, perforation, malignancy, stenosis, vitamin B12-deficiency anemia.

Approaches to pharmacotherapy of the peptic ulcer.

Approaches to rational choice of medicines for the treatment of peptic ulcer. Combined pharmacotherapy for peptic ulcer; interaction with other pharmacotherapeutic groups. Features of the use of medications in gastroenterology in the presence of concomitant pathology. Drugs with toxic effects on the condition of the gastrointestinal tract. Influence of the functional state of the stomach on the clinical efficacy of medicines.

Modern special dosage forms used for peptic ulcer treatment (suspensions, gels for oral administration, tablets for chewing, capsules with mini spheres, etc.), their clinical and biopharmaceutical features, rules and conditions of rational use.

Efficacy and safety criteria for pharmacotherapy of peptic ulcer.

Principles of pharmaceutical care for patients.

Topic 24. Pharmaceutical care for patients with gastrointestinal disorders (hepatitis, cirrhosis, liver failure). Clinical-and-pharmaceutical approaches for medicines selection.

Symptoms and syndromes of major diseases of the hepatobiliary system.

Approaches to drug treatment of liver diseases. The combined use of medicines that affect the function of the hepatobiliary system; interaction with drugs of other pharmacological groups; peculiarities of medication use in the presence of concomitant pathology.

Drugs with toxic effects on the liver condition. Influence of functional condition of liver on bioavailability and clinical efficacy of medicines.

ADRs of medicines used in the pharmacotherapy of liver diseases. Prediction, clinical manifestations, prevention and remedies.

Modern unique dosage forms are used for treating hepatobiliary disorders, their clinical and biopharmaceutical features, and rules and conditions for rational use.

Efficacy and safety criteria for the pharmacotherapy of liver diseases.

Principles of pharmaceutical care for patients with pathology of the liver.

Topic 25. Pharmaceutical care for patients with gastrointestinal disorders (cholelithiasis, pancreatitis). Clinical-and-pharmaceutical approaches for medicines selection.

Symptoms and syndromes of hepatobiliary disorders and pancreas diseases.

Approaches to drug treatment of gallbladder and pancreatic diseases. The combined use of medicines that affect the function of the hepatobiliary system and pancreas; interaction with drugs of other pharmacological groups; peculiarities of medication use in the presence of concomitant pathology.

Drugs that have toxic effects on the condition of the pancreas.

ADRs of medicines used in the pharmacotherapy of pancreatic diseases. Prediction, clinical manifestations, prevention and remedies.

Modern unique dosage forms are used for treating hepatobiliary disorders and pancreatic diseases, their clinical and biopharmaceutical features, rules and conditions for rational use.

Efficacy and safety criteria for the pharmacotherapy of pancreatic diseases.
Principles of pharmaceutical care for patients with pathology of the pancreas.

**Topic 26. Diseases caused by intestinal bacteria (salmonellosis, shigellosis, cholera, botulism).
Pharmaceutical care for infectious intestinal diseases.**

Infectious diseases of the gastrointestinal tract. Approaches to the rational choice of the optimal medicines for pharmacotherapy. Combined use of medications; interaction with other pharmacotherapeutic groups; peculiarities of medication use in the concomitant pathology. Medicines are contraindicated in bacterial intestinal infections. Influence of the functional state of the gastrointestinal tract on the bioavailability and clinical efficacy of drugs. Disruption of water-electrolyte balance in intestinal infections, approaches to its correction. Salt solutions, and pharmaceutical care when used.

Side effects of medicines for drug treatment of intestinal infections. Prediction, clinical manifestations, prevention.

Efficacy and safety criteria.

General principles of pharmaceutical care for patients with infectious intestinal diseases.

Topic 27. Clinical-and-pharmaceutical approaches to treating helminthiasis (nematodes, cestodes, trematodes). Pharmaceutical care for infectious intestinal diseases

Symptoms and syndromes of lesions of different types of helminths (nematodes, cestodes, trematodes). Combined use of medicines; interaction with other pharmacotherapeutic groups; peculiarities of the use of medicines in the concomitant pathology or complications of helminthiasis. Influence of internal organs' functional state on bioavailability and anthelmintics' clinical efficacy.

Side and toxic effects of anthelmintic (antivermicular) medicines. Prediction, clinical manifestations, prevention and remedies.

Safety and efficacy criteria for helminthiasis drug therapy.

Principles of pharmaceutical care for patients with anthelmintic medicines.

Content module 8. Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of cardiovascular and blood disorders

Specific goals:

- to master approaches pharmacotherapy of cardiovascular disorders;
- to master clinical-and-pharmacological characteristics medicines for the pharmacotherapy of cardiovascular disorders;
- to be able to identify the optimal medications for the treatment of cardiovascular disorders, their dosage forms, routes and regimen of administration ;
- to be able to identify safety and efficacy criteria of pharmacotherapy;
- to be able to provide pharmaceutical care to patients with cardiovascular disorders.

Topic 28. Clinical-and-pharmaceutical approaches to the treatment of hypertension and dysrhythmias. Principles of pharmaceutical care for patients with cardiovascular disorders.

Epidemiology of ischemic heart disease. Risk factors for development. Clinical forms of ischemic heart disease (angina pectoris, acute myocardial infarction, postinfarction cardiosclerosis, sudden cardiac death). The main directions of pharmacotherapy for stable angina. Concepts of essential antianginal drugs: nitrates, β -adrenoreceptor blockers, calcium channel blockers, lipid-lowering, etc. Antiplatelet pharmacotherapy. Modern dosage forms of antianginal medicines, principles of rational choice and application. Clinical efficacy criteria for antianginal medicines.

General principles of rational pharmacotherapy for patients with myocardial infarction. The primary medicines are painkillers, antithrombotic, thrombolytic, antiplatelet agents, β -blockers, angiotensin converting enzyme inhibitors and angiotensin II receptor blockers, lipid-lowering agents. Clinical-and-pharmacological approaches to their rational selection and application, precautions for

using of certain groups. Clinical efficacy criteria for antianginal pharmacotherapy and indicators of its rationality (quality).

Topic 29. Clinical-and-pharmaceutical approaches to treatment of hypertension and dysrhythmias. Principles of pharmaceutical care of patients with cardiovascular disorders.

Concept of arterial hypertension: essential arterial hypertension (primary) and secondary (symptomatic) arterial hypertension. Etiology, pathogenesis and diagnostic criteria of the disease. Stages of arterial hypertension, degree of arterial hypertension, cardiovascular risk assessment. Principles of pharmacotherapy for hypertension, mono- and combined pharmacotherapy. Classification and characterization of modern antihypertensive medicines, clinical and pharmacological approaches to their rational choice. The concept of hypertensive crisis, medicines for its elimination. Criteria for clinical efficacy of antihypertensive therapy and indicators of its rationality (quality).

Approaches to the rational choice of drugs for treating cardiovascular diseases. The combined use of medicines in cardiovascular diseases; interaction with drugs of other pharmacotherapeutic groups; peculiarities of medication use in concomitant pathology. Drugs with a negative effect on the condition of the cardiovascular system. Side effects of drugs used in cardiology. Prediction, clinical manifestations, prevention, and remedies. Modern dosage forms used in cardiology (retarded, the modified release of the active substance), their clinical and biopharmaceutical features, rules and conditions of rational use. Efficacy and safety criteria for pharmacotherapy in cardiology. Causes, mechanisms of development and types of disorders of heart rhythm and conduction, clinical manifestations, diagnostic criteria. Areas of pharmacotherapy for heart rhythm disorders. Classification and characterization of medicines, clinical and pharmacological approaches to their rational choice. Clinical efficacy criteria for pharmacotherapy and indicators of its rationality (quality).

Principles of pharmaceutical care to patients with the cardiac profile.

Topic 30. Clinical-and-pharmaceutical approaches to the treatment of acute and chronic heart failure and atherosclerosis. The role of pharmaceutical care in rational drug choice and application.

Etiology, the pathogenesis of acute and chronic heart failure. Clinical features, diagnostic criteria, classification of chronic heart failure (stages and functional classes). Main directions of pharmacotherapy for chronic heart failure. First-line drugs for chronic heart failure pharmacotherapy, principles of choice, clinical effectiveness criteria.

Etiology and pathogenesis of atherosclerosis. The concept of dyslipidemia. Areas of pharmacotherapy for atherosclerosis. lipid-lowering drugs, their clinical-and-pharmacological characteristics, principles of rational choice, features of use, ADRs. Criteria for the clinical efficacy of hypolipidemic medicines, safety assessment of their use.

Topic 31. Clinical-and-pharmaceutical approaches to the treatment of blood disorders. Treatment of anemia, thrombosis.

Thrombosis and anemia. General information about development factors, etiology, pathogenesis, clinical picture, diagnostic criteria. Pulmonary embolism and (lower extremity) deep vein thrombosis. Pharmacotherapy. The leading groups of medicines are antiplatelets, thrombolytic agents, anticoagulants, their clinical and pharmacological characteristics, features of action and use. Evaluation of the clinical efficacy of thrombolytic pharmacotherapy. Thrombophlebitis. Varicose veins of the lower extremities. Etiology, pathogenesis, clinical manifestations of the disease, stages of development.

General principles of pharmacotherapy. Leading groups of medicines: angioprotective agents and capillary stabilizing agents, principles of choice. Local and systemic drugs. Evaluation of the clinical efficacy of pharmacotherapy. Ferrum containing medicines.

Content module 9. Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of the kidney, genitourinary, connective tissue, and musculoskeletal disorders.

Specific goals:

- to master the main symptoms and syndromes of kidney and genitourinary disorders;
- to master approaches pharmacotherapy of kidney and genitourinary disorders;
- to master clinical-and-pharmacological characteristics of medicines for the pharmacotherapy of kidney and genitourinary disorders;
- to be able to identify the optimal medications for treatment of kidney and genitourinary disorders;
- to be able to identify dosage forms, routes and regimen of administration of medications;
- to be able to identify efficacy and safety criteria for the pharmacotherapy.
- to master the main symptoms and syndromes of connective tissue and musculoskeletal disorders;
- to master approaches pharmacotherapy of connective tissue and musculoskeletal disorders;
- to master clinical-and-pharmacological characteristics medicines for the pharmacotherapy of connective tissue and musculoskeletal disorders;
- to be able to identify the optimal medications for the pharmacotherapy of connective tissue and musculoskeletal disorders;
- to be able to identify dosage forms, routes and regimens of administration of medicines;
- to be able to identify the safety and efficacy criteria of the chosen pharmacotherapy;
- to be able to provide pharmaceutical care to patients with connective tissue and musculoskeletal disorders.

Topic 32. Pharmaceutical care of patients with kidney and genitourinary disorders (urolithiasis, cystitis, urethritis, renal failure). Clinical-and-pharmaceutical approaches to rational pharmacotherapy.

Symptoms and syndromes of kidney and urinary tract diseases. Complications of kidney disease. Approaches to the rational choice of medicines for treating of kidney disease and the urinary system. The combined use of medicines that affect kidney function and the urinary system; interaction with other pharmacotherapeutic groups. Features of drugs used in nephrology, in the concomitant pathology. Drugs with a toxic effect on the kidneys condition. Influence of the functional state of the kidneys on the clinical efficacy of medicines, mainly the correction of dosage and administration.

Principles of treatment of complications of kidney diseases.

Side effects of medicines used in treating of diseases of the urinary system. Prediction, clinical manifestations, prevention.

Efficacy and safety criteria for pharmacotherapy in nephrology.

Principles of pharmaceutical care to patients with kidney disease.

Topic 33. Pharmaceutical care in the pharmacotherapy of excretory system and connective tissue disorders of immune origin (glomerulonephritis, pyelonephritis). Clinical-and-pharmaceutical approaches to rational pharmacotherapy.

General characteristics of connective tissue diseases of the immune origin. Etiology, pathogenesis, clinical manifestations, course and diagnostic criteria, their importance for the rational choice of treatment. The main areas of pharmacotherapy. Principles of rational choice of medicines, their application, criteria of efficacy and safety.

Principles of pharmaceutical care for patients with immune connective tissue disorders.

Topic 34. Pharmaceutical care for patients with connective tissue disorders. Clinical-and-pharmaceutical approaches to rational drug choice and application for the treatment of rheumatic fever and its complications.

General characteristics of connective tissue diseases of the immune origin. Etiology, pathogenesis, clinical manifestations, course and diagnostic criteria, their importance for the rational choice of treatment. The main areas of pharmacotherapy. Principles of rational choice of medicines, their application, criteria of efficacy and safety.

Topic 35. Clinical-and-pharmaceutical approaches to the treatment of connective tissue disorders (systemic lupus erythematosus, systemic scleroderma).

Etiology, pathogenesis, features of the clinical picture, diagnostic criteria for systemic lupus erythematosus. Principles of complex pharmacotherapy, the prognosis of treatment.

Systemic scleroderma as a multiple-syndrome disease, diagnostic criteria, directions of complex pharmacotherapy. The leading group of medicines the principles of rational choice. Measures to reduce the ADRs of certain medications.

Topic 36. Clinical-and-pharmaceutical approaches to the treatment of connective tissue and musculoskeletal disorders (gout, osteoarthritis, osteoporosis, rheumatoid polyarthritis).

Etiology, pathogenesis, clinical manifestations of gout. Areas of pharmacotherapy. The main groups of medicines are for pathogenetic (purine metabolism) and symptomatic (non-steroidal anti-inflammatory drugs, glucocorticosteroids) pharmacotherapy. Principles of rational choice and peculiarities of application of certain drugs.

Classification, etiology, pathogenesis, clinical manifestations of osteoarthritis. Areas of pharmacotherapy. Drugs for pathogenetic and symptomatic pharmacotherapy, clinical and pharmacological approaches to their choice. Evaluation of the clinical efficacy of pharmacotherapy.

Classification, etiology, pathogenesis, clinical manifestations of osteoporosis. Areas of pharmacotherapy. Drugs for pathogenetic (calcium and vitamin D drugs; essential anti-osteoporotic drugs: bone resorption inhibitors; bone stimulating drugs) and symptomatic (non-narcotic analgesics) pharmacotherapy. Evaluation of the clinical efficacy of pharmacotherapy.

Etiology, pathogenesis, clinical picture, diagnostic criteria for rheumatoid arthritis, classification, modern approaches to pharmacotherapy. The importance of anti-inflammatory drugs, basic therapy drugs, antimetabolites and immunosuppressants in the rational pharmacotherapy of rheumatoid arthritis.

Principles of pharmaceutical care for patients with connective tissue and musculoskeletal disorders.

Content module 10. Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of endocrine disorders.

Specific goals:

- to master the main symptoms and syndromes of endocrine disorders;
- to master approaches pharmacotherapy of endocrine disorders;
- to master clinical-and-pharmacological characteristics of medicines for endocrine disorders pharmacotherapy;
- to be able to identify the optimal medications for the treatment of endocrine disorders;
- to be able to identify dosage forms, routes and regimens of administration medicines;
- to be able to identify the safety and efficacy criteria of the chosen pharmacotherapy.

Topic 37. Clinical-and-pharmaceutical approaches to the treatment of endocrine disorders. Treatment of diseases of the pituitary and adrenal glands. Hypo- and hyperthyroidism treatment.

Etiology and pathogenesis, the main clinical features, diagnostic criteria of the pituitary and adrenal gland diseases. General principles of treatment. The main areas of pharmacotherapy. Principles of rational choice of medicines and their application. Principles of rational choice of medicines and pharmacological and non-pharmacological therapy.

Etiology and pathogenesis, the main clinical manifestations, diagnostic criteria for thyroid disease, general principles of treatment. The main areas of pharmacotherapy. Principles of rational choice of medicines, features of the application. Causes, mechanisms of development, diagnostic criteria and the main directions of pharmacotherapy of diffuse toxic goiter, hypothyroidism. Principles of rational choice of medicines and application of drug and non-drug types of therapy.

Topic 38. Clinical-and-pharmaceutical approaches to the treatment of endocrine disorders. Pharmaceutical care for patients with diabetes mellitus type 1 and 2.

Etiology and pathogenesis, the main clinical manifestations, diagnostic criteria for type 1 and type 2 diabetes, general treatment principles. The main directions of pharmacotherapy for diabetes. Principles of insulin therapy in type 1 diabetes pharmacotherapy. Insulin preparations of different duration of action. Principles of rational choice, features of the application. Oral antidiabetic agents for type 2 diabetes pharmacotherapy. Principles of rational choice and features of the application. Concepts of hypo- and hyperglycemic coma: causes, clinical picture, the main directions of pharmacotherapy. Complications of diabetes and directions of their rational pharmacotherapy.

Topic 39. Clinical-and-pharmaceutical aspects of hormone replacement therapy. Pharmaceutical care for oral contraceptive medications use.

Principles of hormone replacement therapy. Hormones as medicines. Principles of choice for hormone replacement therapy. Evaluation of the efficacy and safety of medicines.

Modern contraceptives, evaluation of their efficacy and safety. The mechanism of action of drug contraceptives. Principles of their rational application. Features of interactions of oral contraceptives with other medicines, food, alcohol, and nicotine. The algorithm of pharmaceutical care for the release of contraceptives at the community pharmacy.

Content module 11. Clinical-and-pharmaceutical approaches to rational medicines use in neurological system disorders pharmacotherapy.

Specific goals:

- to know causes, mechanisms of development, clinical features of the nervous system disorders;
- to interpret the results of the basic methods of examination of patients to justify the optimal choice of medicines for rational pharmacotherapy of the nervous system disorders;
- to explain the principles of pharmacotherapy for the certain nervous system disorders,
- to know rational pharmacotherapy schemes;
- to apply clinical-and-pharmacological approaches to rational medicines choice and evaluate pharmacotherapeutic effects, predict/prevent/reduce ADRs of the medicines where possible.

Topic 40. Pharmaceutical care in the treatment of neurological disorders (ischemic stroke, brain hemorrhage). Clinical-and-pharmaceutical approaches to rational drug choice and application

The main symptoms and syndromes of neurological diseases. Concepts and directions of pharmacotherapy of major neurological diseases associated with acute and chronic disorders of the cerebral circulation (hemorrhagic and ischemic strokes). Features of rational selection and application.

The side effects of pharmacotherapy, the approach to prevention and correction of the ADRs. Principles of pharmaceutical care for patients with the most common neurological diseases.

Topic 41. Pharmaceutical care in the treatment of neurological disorders (epilepsy, parkinsonism, neuritis, multiple sclerosis) Clinical-and-pharmaceutical approaches to rational drug choice and application..

The main symptoms and syndromes of neurological diseases. Etiology, pathogenesis, clinical features and the main directions of pharmacotherapy of major neurological disorders (neuritis, epilepsy, parkinsonism, multiple sclerosis), complications of these diseases and approaches to emergency pharmacotherapy in neurology. Principles of rational choice of medicines for the pharmacotherapy of major neurological disorders. The side effects of pharmacotherapy, the approach to prevention and correction of the ADRs. Principles of pharmaceutical care for patients with the most common neurological diseases.

Content module 12. Clinical-and-pharmaceutical approaches to rational use of medicines in oncology.

Specific goals:

- to know the causes, mechanisms of development, clinical features of the oncological diseases;
- to interpret the results of the basic methods of examination of patients to justify the optimal choice of medicines for rational pharmacotherapy;
- to explain the principles of pharmacotherapy for the certain oncological diseases,
- to know rational pharmacotherapy schemes;
- to apply clinical-and-pharmacological approaches to rational medicines choice and evaluate pharmacotherapeutic effects, predict/prevent/reduce ADRs of the certain medicines where possible.

Topic 42. Clinical-and-pharmaceutical approaches to the treatment of oncology disorders.

The main symptoms and syndromes of oncological diseases. Etiology, pathogenesis, clinical features and the main directions of pharmacotherapy of major oncological diseases, complications of these diseases and approaches to emergency pharmacotherapy in oncology. Principles of rational choice of medicines for the pharmacotherapy of major oncological diseases. The side effects of pharmacotherapy, the approach to prevention and correction of the ADRs. Principles of pharmaceutical care for patients with the most common oncological diseases.

3. Structure of the academic discipline.

Topic	Lectures	Practical classes	Self-study	Personal work
Content module 1. <i>Objects and tasks of clinical pharmacy. Concept of pharmaceutical care. Evidence-based medicine as one of the main tools for ensuring the rationality of pharmacotherapy. Clinical trials of medicines.</i>				
Topic 1. The subject and main tasks of clinical pharmacy. The fundamentals of pharmaceutical care. Medication-taking behavior of the patient. Features of pharmaceutical care in ensuring and maintaining a high level of adherence.	1	4	8	-
Topic 2. Evidence-based medicine as a tool for ensuring the rationality of pharmacotherapy. The principle of drug choosing for pharmacotherapy.	0,5	4	8	

Topic 3. The role of the pharmacist in clinical trials of medicines. Bioavailability and bioequivalence of drugs assessment. Correlation of the in vitro - in vivo methods.	0,5	4	8	
Total for the content module 1:	2	12	24	
Content module 2. <i>Alteration of the pharmacotherapeutic effect of medicines when using drug combinations. Side effects and adverse drug reactions. Drug-induced disorder.</i>				
Topic 4. Drug interactions, principles of their classification. Pharmaceutical care aims to prevent the undesirable consequences of drug interactions.	2	4	5	
Topic 5. Adverse drug reactions and side effects. Types of ADRs, risk factors for their occurrence, and clinical manifestations. Pharmacovigilance system. Drug-induced disorders as a result of irrational use of medicines.	2	4	5	-
Total for the content module 2:	4	8	10	
Content module 3. <i>Fundamentals of rational medicines use in different age groups of patients. Evaluation of efficacy and safety of medicines in different clinical conditions.</i>				
Topic 6. Clinical-and-pharmacological approaches to the use of medicines during pregnancy and lactation. The role of pharmaceutical care in rational pregnancy management.	2	4	6	
Topic 7. Clinical-and-pharmacological approaches to the use of medicines in pediatrics and neonatology. Pharmaceutical care of neonates and children of different age groups. Specifics of pharmaceutical care in pediatrics and neonatology for physicians, nursing staff, patients, and their relatives.	1	4	4	-
Topic 8. Principles of clinical-and-pharmaceutical approach to rational medicines use in geriatrics. Peculiarities of pharmaceutical care of elderly patients.	1	4	4	
Total for the content module 3:	4	12	14	
Total	10	32	48	
Content module 4. <i>Fundamentals of rational self-medication. Pharmaceutical care when dispensing OTC medicines.</i>				
Topic 9. Responsible self-medication, current regulatory judicial framework for its provision. Participation of the pharmacist in responsible self-medication. OTC-medications, principles of their choice for self-medication of the gastrointestinal disorders and local circulatory disorders. Pharmaceutical care.	1	2	2	-
Topic 10. Conditions for self-medication. OTC-medicines, their selection for self-medication in case of cold, cough, rhinitis, the pain of different origin, fever. Pharmaceutical care.	0,5	2	2	
Topic 11. Conditions for self-medication. OTC-medicines, their selection for self-medication of the local circulatory disorders, acne, burns, scabies, traumatic skin disorders, wounds, etc. Pharmaceutical care.	0,5	2	2	
Total for the content module 4:	2	6	6	

Content module 5. <i>Fundamentals of antibacterial, antiviral, and antifungal medicines use.</i>				
Topic 12. Clinical-and-pharmaceutical approaches to antibacterial agents use.	0,5	2	2	-
Topic 13. The role of pharmaceutical care in rational antibiotic pharmacotherapy.	0,5	2	2	
Topic 14. Clinical-and-pharmaceutical approaches to antiviral medicines use. Pharmaceutical care.	0,5	2	3	
Topic 15. Clinical-and-pharmaceutical approaches to antifungal medicines use. Pharmaceutical care.	0,5	2	2	
Total for the content module 5:				
2				
8				
8				
Content module 6. <i>Clinical-and-pharmaceutical approaches to medicines use for respiratory, ENT, and allergic disorders.</i>				
Topic 16. Clinical-and-pharmaceutical approaches to the treatment of allergic disorders. Systemic allergic reactions. The role of pharmaceutical care in the prevention and treatment of allergic reactions.	1	2	3	-
Topic 17. Clinical-and-pharmaceutical approaches to the treatment of allergic disorders. Local allergic reactions. The role of pharmaceutical care in the prevention and treatment of allergic reactions.	1	2	2	
Topic 18. Clinical-and-pharmaceutical approaches to treating ENT disorders (acute and chronic tonsillitis, pharyngitis, laryngitis, sinusitis, otitis). The role of pharmaceutical care in the rational use of medicines.	0,5	2	3	
Topic 19. Pharmaceutical care of patients with bronchial asthma.	0,5	2	2	
Topic 20. Clinical-and-pharmaceutical approaches to treating respiratory organs (bronchitis, respiratory failure). The role of pharmaceutical care in the rational use of medicines.	0,5	2	2	
Topic 21. Clinical-and-pharmaceutical approaches to treating respiratory organs diseases (pneumonia, lung tuberculosis). The role of pharmaceutical care in the rational use of medicines.	0,5	2	2	
Total for the content module 6:				
4				
12				
14				
Content module 7. <i>Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of gastrointestinal tract disorders.</i>				
Topic 22. Pharmaceutical care for patients with gastrointestinal disorders (gastritis, gastroenteritis, colitis, enteritis). Clinical-and-pharmaceutical approaches for medicines selection.	0,5	2	3	-
Topic 23. Pharmaceutical care for patients with peptic ulcer. Clinical-and-pharmaceutical approaches for medicines selection.	0,5	2	2	
Topic 24. Pharmaceutical care for patients with gastrointestinal disorders (hepatitis, cirrhosis, liver failure). Clinical-and-pharmaceutical approaches for medicines selection.	0,5	2	3	

Topic 25. Pharmaceutical care for patients with gastrointestinal disorders (holelithiasis, pancreatitis). Clinical-and-pharmaceutical approaches for medicines selection	0,5	2	2	
Topic 26. Diseases caused by intestinal bacteria (salmonellosis, shigellosis, cholera, botulism). Pharmaceutical care for infectious intestinal diseases.		2	2	
Topic 27. Clinical-and-pharmaceutical approaches to treating helminthiasis (nematodes, cestodes, trematodes). Pharmaceutical care for infectious intestinal diseases.		2	2	
Total for the content module 7:	2	12	14	
TOTAL	10	38	42	
Final control				Credit
Content module 8.				
<i>Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of cardiovascular and blood disorders</i>				
Topic 28. Clinical-and-pharmaceutical approaches to the treatment of hypertension and dysrhythmias. Principles of pharmaceutical care for patients with cardiovascular disorders.		3	3	
Topic 29. Clinical-and-pharmaceutical approaches to treatment of hypertension and dysrhythmias. Principles of pharmaceutical care of patients with cardiovascular disorders.		3	3	
Topic 30. Clinical-and-pharmaceutical approaches to the treatment of acute and chronic heart failure and atherosclerosis. The role of pharmaceutical care in rational drug choice and application.		3	3	
Topic 31. Clinical-and-pharmaceutical approaches to the treatment of blood disorders. Treatment of anemia, thrombosis.		3	3	
Total for the content module 8:		12	12	
Content module 9.				
<i>Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of the kidney, genitourinary, connective tissue, and musculoskeletal disorders.</i>				
Topic 32. Pharmaceutical care of patients with kidney and genitourinary disorders (urolithiasis, cystitis, urethritis, renal failure). Clinical-and-pharmaceutical approaches to rational pharmacotherapy.		3	3	
Topic 33. Pharmaceutical care in the pharmacotherapy of excretory system and connective tissue disorders of immune origin (glomerulonephritis, pyelonephritis). Clinical-and-pharmaceutical approaches to rational pharmacotherapy.		3	3	
Topic 34. Pharmaceutical care for patients with connective tissue disorders. Clinical-and-pharmaceutical approaches to rational drug choice and application for the treatment of rheumatic fever and its complications.		3	3	
Topic 35. Clinical-and-pharmaceutical approaches to the treatment of connective tissue disorders (systemic lupus erythematosus, systemic scleroderma).		3	3	

Topic 36. Clinical-and-pharmaceutical approaches to the treatment of connective tissue and musculoskeletal disorders (gout, osteoarthritis, osteoporosis, rheumatoid polyarthritis).		3	3	
Total for the content module 9:		15	15	
Content module 10. Clinical-and-pharmaceutical approaches to the rational use of medicines in the treatment of endocrine disorders.				
Topic 37. Clinical-and-pharmaceutical approaches to the treatment of endocrine disorders. Treatment of diseases of the pituitary and adrenal glands. Hypo- and hyperthyroidism treatment.		3	4	-
Topic 38. Clinical-and-pharmaceutical approaches to the treatment of endocrine disorders. Pharmaceutical care for patients with diabetes mellitus type 1 and 2.		3	3	
Topic 39. Clinical-and-pharmaceutical aspects of hormone replacement therapy. Pharmaceutical care for oral contraceptive medications use.		3	3	
Total for the content module 10:		9	10	
Content module 11. Clinical-and-pharmaceutical approaches to rational medicines use in neurological system disorders pharmacotherapy.				
Topic 40. Pharmaceutical care in the treatment of neurological disorders (ischemic stroke, brain hemorrhage). Clinical-and-pharmaceutical approaches to rational drug choice and application		3	3	-
Topic 41. Pharmaceutical care in the treatment of neurological disorders (epilepsy, parkinsonism, neuritis, multiple sclerosis) Clinical-and-pharmaceutical approaches to rational drug choice and application.		3	2	
Total for the content module 10:		6	5	
Content module 12. Clinical-and-pharmaceutical approaches to rational use of medicines in oncology.				
Topic 42. Clinical-and-pharmaceutical approaches to the treatment of oncology disorders.		3	3	
Total for the content module 11:		3	3	
TOTAL		20	45	45
FINAL CONTROL				Exam
TOTAL HOURS 270/9.0 ECTS CREDITS		20	115	135

4. Course outline of lectures.

№	TOPIC	Hours
IV year, VII semester		
1.	Objects and tasks of the discipline «Clinical pharmacy and pharmaceutical care». Concept of pharmaceutical care. Clinical-and-pharmaceutical and clinical-and-pharmacological principles of medicines choice for rational pharmacotherapy. Evidence-based medicine as one of the main tools for ensuring the rationality of pharmacotherapy. Principles of clinical trials of medicines.	2
2.	Drug interaction in the combined pharmacotherapy. Clinical manifestations of drug interaction, principles of detection and prevention of the dangerous drug	2

	interactions.	
3.	Side effects and adverse drug reactions. Principles of the ADRs prediction. Pharmacovigilance system. Drug-induced disorders as a consequence of irrational use of medicines.	2
4.	Safety use of medicines in special physiological conditions (during pregnancy, lactation).	2
5.	Age-specific features of medication use. Clinical-and-pharmacological approaches to medicine use in pediatrics, neonatology, and geriatrics.	2
	Total	10
IV kypc, VIII semester		
6.	Clinical-and-pharmaceutical aspects of responsible self-medication. The role of pharmaceutical care in rational use of the OTC medicines.	2
7.	Clinical-and-pharmaceutical approaches to antibiotics, antiviral and antifungal agents use.	2
8.	Principles of clinical-and-pharmaceutical approach to the treatment of allergic disorders.	2
9.	Clinical-and-pharmaceutical approaches to the treatment of respiratory and ENT disorders.	2
10.	Principles of clinical-and-pharmaceutical approach to the treatment of gastric, intestinal, bowel, liver, and pancreas disorders.	2
	Total	10
	TOTAL FOR DISCIPLINE	20

5. Course outline of practical classes.

№.	TOPIC	Hours
IV year, VII semester		
1.	The subject and main tasks of clinical pharmacy. The fundamentals of pharmaceutical care. Medication (drug) intake behavior of the patient. Features of pharmaceutical care in ensuring and maintaining a high level of adherence.	4
2.	Evidence-based medicine as a tool for ensuring the rationality of pharmacotherapy. The principle of drug choice for pharmacotherapy.	4
3.	Principles of preclinical and clinical trials of medicines. Study of bioavailability and bioequivalence of drugs.	4
4.	Drug interactions, principles of their classification. Pharmaceutical care which directed at preventing the undesirable effects of drug interactions.	4
5.	Adverse drug reactions and side effects. Types of ADRs, risk factors for their occurrence, and clinical manifestations. Pharmacovigilance system. Drug-induced disorders as a result of irrational use of medicines.	4
6.	Clinical-and-pharmaceutical approaches to use of medicines during pregnancy and lactation. The role of pharmaceutical care in the rational management of pregnancy.	4
7.	Clinical-and-pharmaceutical approaches to use of medicines in pediatrics and neonatology. Pharmaceutical care of newborns and children of different age groups. Features of its implementation for physicians, nursing staff, patients.	4
8.	Principles of clinical-and-pharmaceutical approach to the rational use of drugs in geriatrics. Features of pharmaceutical care of elderly patients.	4
	Total	32
IV year, VIII semester		
9.	Responsible self-medication, the current regulatory and judicial framework for its provision. Participation of the pharmacist in responsible self-medication. OTC-	2

	medications, principles of their choice for self-medication of gastrointestinal disorders and. Pharmaceutical care for the OTC-medicines use.	
10.	Conditions for self-medication. OTC-medicines, their selection for self-medication in case of cold, cough, rhinitis, the pain of different origin, fever. Pharmaceutical care for the OTC-medicines.	2
11.	Conditions for self-medication. OTC-medicines, their selection for self-medication of the local circulatory disorders, acne, burns, scabies, traumatic skin disorders, wounds, etc. Pharmaceutical care for the OTC-medicines.	2
12.	Clinical-and-pharmaceutical approaches to antibacterial agents use.	2
13.	The role of pharmaceutical care in rational antibiotic pharmacotherapy.	2
14.	Clinical-and-pharmaceutical approaches to antiviral medicine use. Pharmaceutical care.	2
15.	Clinical-and-pharmaceutical approaches to antifungal medicine use. Pharmaceutical care.	2
16.	Clinical-and-pharmaceutical approaches to the treatment of allergic disorders. Systemic allergic reactions. The role of pharmaceutical care in the prevention and treatment of allergic reactions.	2
17.	Clinical-and-pharmaceutical approaches to the treatment of allergic disorders. Local allergic reactions. The role of pharmaceutical care in the prevention and treatment of allergic reactions.	2
18.	Clinical-and-pharmaceutical approaches to treating ENT disorders (acute and chronic tonsillitis, pharyngitis, laryngitis, sinusitis, otitis). The role of pharmaceutical care in rational medicine use.	2
19.	Pharmaceutical care for patients with bronchial asthma.	2
20.	Clinical-and-pharmaceutical approaches to treating respiratory organ diseases (bronchitis, respiratory failure). The role of pharmaceutical care in the rational use of medicines.	2
21.	Clinical-and-pharmaceutical approaches to treating respiratory organ diseases (pneumonia, lung tuberculosis). The role of pharmaceutical care in the rational use of medicines.	2
22.	Pharmaceutical care for patients with gastrointestinal disorders (gastritis, gastroenteritis, colitis, enteritis). Clinical-and-pharmaceutical approaches for medicines selection.	2
23.	Pharmaceutical care of patients with peptic ulcer. Clinical-and-pharmaceutical approaches for medicines selection.	2
24.	Pharmaceutical care for patients with gastrointestinal disorders (hepatitis, cirrhosis, liver failure). Clinical-and-pharmaceutical approaches for medicines selection.	2
25.	Pharmaceutical care for patients with gastrointestinal disorders (cholelithiasis, pancreatitis). Clinical-and-pharmaceutical approaches for medicines selection.	2
26.	Diseases caused by intestinal bacteria (salmonellosis, shigellosis, cholera, botulism). Pharmaceutical care for infectious intestinal diseases.	2
27.	Clinical-and-pharmaceutical approaches to treating helminthiasis (nematodes, cestodes, trematodes). Pharmaceutical care for infectious intestinal diseases.	2
	Total	38
V year, IX semester		
28.	Pharmaceutical care in ischemic heart disease (angina pectoris, acute myocardial infarction). Clinical-and-pharmaceutical approaches to medicines choice.	3
29.	Clinical-and-pharmaceutical approaches to the treatment of hypertension and dysrhythmias. Principles of pharmaceutical care of patients with cardiovascular disorders.	3

30.	Clinical-and-pharmaceutical approaches to treating acute and chronic heart failure and atherosclerosis. The role of pharmaceutical care in the rational drug choice and application.	3
31.	Clinical-and-pharmaceutical approaches to the treatment of blood disorders. Treatment of anemia, thrombosis.	3
32.	Pharmaceutical care for patients with kidney and genitourinary disorders (urolithiasis, cystitis, urethritis, renal failure). Clinical-and-pharmaceutical approaches to rational pharmacotherapy.	3
33.	Pharmaceutical care in the pharmacotherapy of excretory system and connective tissue disorders of immune origin (glomerulonephritis, pyelonephritis). Clinical-and-pharmaceutical approaches to rational pharmacotherapy.	3
34.	Pharmaceutical care in the pharmacotherapy of connective tissue disorders. Clinical-and-pharmaceutical approaches to rational drug choice and application for the treatment of rheumatic fever and its complications.	3
35.	Clinical-and-pharmaceutical approaches to the treatment of connective tissue disorders (systemic lupus erythematosus, systemic scleroderma).	3
36.	Clinical-and-pharmaceutical approaches to the treatment of connective tissue and musculoskeletal disorders (gout, osteoarthritis, osteoporosis, rheumatoid polyarthritis).	3
37.	Clinical-and-pharmaceutical approaches to the treatment of endocrine disorders. Treatment of diseases of the pituitary and adrenal glands. Hypo- and hyperthyroidism treatment.	3
38.	Clinical-and-pharmaceutical approaches to the treatment of endocrine disorders. Pharmaceutical care for patients with diabetes mellitus type 1 and 2.	3
39.	Clinical-and-pharmaceutical aspects of hormone replacement therapy. Pharmaceutical care for oral contraceptive medications use.	3
40.	Pharmaceutical care when treating neurological disorders (ischemic stroke, brain hemorrhage). Clinical-and-pharmaceutical approaches to rational drug choice and application	3
41.	Pharmaceutical care when treating neurological disorders (epilepsy, parkinsonism, neuritis, multiple sclerosis). Clinical-and-pharmaceutical approaches to rational drug choice and application	3
42.	Clinical-and-pharmaceutical approaches to the treatment of oncology disorders	3
	Total	45
	TOTAL FOR DISCIPLINE	115

6. Course outline of the individual student's work.

№	TOPIC	Hours	Type of control
IV year, VII semester			
1.	Basic medical terminology. Legal aspects of pharmacist's activity related to pharmacotherapy.	4	Current control during practical classes
2.	Medication intake behavior (drug behavior) of the patient. Features of pharmaceutical care in ensuring and maintaining a high level of adherence.	4	
3.	Searching for evidence-based medicine information on the drug's use.	8	
4.	Clinical drug evaluation. Good clinical practice.	8	
5.	Factors affecting the effect and interactions of drugs. Adverse drug reactions and side effects: types, methods of assessment.	10	

	Pharmacovigilance system and its main tasks.		
6.	Clinical-and-pharmaceutical approaches to medicine use during pregnancy, childbirth (delivery), and breastfeeding. The main principles of pharmaceutical care.	6	
7.	Age-related features of pharmacotherapy. Principles of medicine use in pediatrics and geriatrics. The main principles of pharmaceutical care.	8	
	Total	48	
IV year, VIII semester			
8.	Responsible self-medication and its concept. Principles of pharmaceutical care for OTC medicines use.	6	Current control during practical classes
9.	Pharmaceutical care in rational use of antibacterial, antiviral, and antifungal agents.	6	
10.	Immunization. General principles of immunization. Sepsis, septic shock. Vaccination.	2	
11.	Pharmaceutical care in the treatment of allergic disorders. Medications, classification, and characteristics.	5	
12.	Pharmaceutical care in the use of medicines for the treatment of ENT disorders.	4	
13.	Pharmaceutical care in the treatment of respiratory disorders.	5	
14.	Pharmaceutical care in the treatment of gastric, intestinal, and bowel disorders. General principles of diagnostics and treatment of gastrointestinal tract disorders.	5	
15.	Pharmaceutical care in the treatment of liver disorders. General principles of diagnostics and treatment of gastrointestinal tract disorders.	5	
16.	Pharmaceutical care in the treatment of gastrointestinal tract infections	4	
	Total	42	
V year, IX semester			
17.	Pharmaceutical care when treating cardiovascular (ischemic heart disease, arterial hypertension, dysrhythmias, heart failure, atherosclerosis) and blood disorders. General diagnostics and treatment principles.	12	Current control during practical classes
18.	Medications for the treatment of kidney and genitourinary tract disorders. General principles of diagnostics and treatment.	6	
19.	Pharmaceutical care in the treatment of diabetes mellitus type 1 and type 2. Contemporary insulins and oral hypoglycemic medications.	3	
20.	Pharmaceutical care in the treatment of the thyroid, pituitary, and adrenal gland disorders. Principles of prophylactic and treatment. Contemporary medicines and peculiarities of use.	4	
21.	Pharmaceutical care in hormone therapy of connective tissue, skin, and musculoskeletal system disorders.	9	
22.	Pharmaceutical care for the use of oral contraceptives. Hormone replacement therapy.	3	
23.	Pharmaceutical care for the use of medicines in neurology.	5	
24.	Pharmaceutical care in oncology.	3	
	Total	45	
TOTAL FOR DISCIPLINE		135	

7. Individual student's work – are not foreseen.

8. Teaching methods. In the process of «Clinical Pharmacy and Pharmaceutical Care» disciplines studying, the following teaching methods are used for students: explanatory-illustrated (multimedia lectures with elements of discussion communication with applicants of higher education), reproductive, research, part-search (independent work of search character, work with literature); verbal (story, explanation, conversation, instruction, lecture, discussion), visual (demonstration of films, illustrations, schemes, algorithms); practical methods (practical activities, modeling); objective methods (generalization of the results of observations).

The types of educational activities in the process of the discipline «Clinical pharmacy and pharmaceutical care» mastering according to the academic plan are as follows:

- a) lectures;
- b) practice lessons;
- c) individual student's work;
- d) consultations.

The lecture course topics reveal the problematic issues of the respective chapters of the discipline.

The practice lessons take place in the classrooms of the department following the conventional structure and stages of the conduct as follows:

1. Preparatory stage (arrangement of the class, setting of educational goals and their motivation, control of the initial level of knowledge (multiple-choice test tasks of varying difficulty).
2. The main stage (forming of the professional skills).
3. Final stage – control of the final level of knowledge and skills. Summarizing.

To provide a high level of training for future professionals in mastering the discipline «Clinical pharmacy and pharmaceutical care», modern interactive teaching methods are used. Lectures are given as multimedia presentations, and online access to resources is provided. Systems of current knowledge control are fully automated and conducted as open computer testing. A specially equipped computer and simulation class operates. In addition, students can use the library of textbooks, guidelines and manuals, periodicals, and the electronic database.

9. Methods of control. Evaluation of the student's educational activity results is carried out during the current and final control.

Current control includes assessing theoretical knowledge, practical skills, and independent work.

The forms of final control per the educational and professional program are a credit and an exam.

10. The current control. Ongoing control is carried out during the practice lesson according to specific objectives. Objective control of theoretical training and practical skills is applied.

10.1 *The current educational activity assessment.* During the topic assimilation assessment, grades for the current educational activity are given to the student according to a 4-point (national) scale. This considers all types of work provided by the discipline program. In addition, independent student's work is evaluated during the current control of practical training.

TEST EVALUATION CRITERIA
(written, computer), N=20

Number of the correct answers	Score (according to the 4-point scale)
0-9	2
10-13	3
14-17	4
18-20	5

11. The form of the final mastering control and students' knowledge assessment are Credit / Exam. Semester credit in disciplines is provided after the corresponding semesters are over before the exam session starts.

The final control is provided as an exam on the educational material, determined in the syllabus according to the educational plan (student's educational plan).

A semester exam is the type of final control of the obtained knowledge and practical skills during the semester and is provided as a control measure. The student is admitted to the semester exam on the educational discipline if he had attended all the required classes, fulfilled all types of work according to the syllabus on this particular discipline, and had gained enough points, not less than minimal.

A semester exam in the discipline «Clinical pharmacy ra pharmaceutical care» is provided in the written form during the exam session according to the timetable. The mode of the exam is standardized. It includes theory and practical skills control in the form of the MCQ test.

12. The regularities for grades and score points number gaining by students:

The maximum amount of points that a student can earn for his / her current educational activity while studying the discipline equals 120 points.

The minimal amount of points that a student must earn for his / her current educational activity while studying to enroll in the discipline equals 72 points.

The number of points is calculated based on the student's grades according to the 4-point (national) scale while studying the discipline, calculating the arithmetic mean (AM) rounded to two digits after the decimal point. Then, the resulting value is converted into points according to the multi-point scale as follows:

$$x = \frac{AM \times 120}{5}$$

For practical reasons the table of converting the score to the 200-point scale is given below.

Converting of the average score for the current activity into a multi-point scale for the disciplines completed with the Exam

4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale
5	120	5	120	3.91	94	3.37	81
4.95	119	4.95	119	3.87	93	3.33	80
4.91	118	4.91	118	3.83	92	3.29	79
4.87	117	4.87	117	3.79	91	3.25	78
4.83	116	4.83	116	3.74	90	3.2	77
4.79	115	4.79	115	3.7	89	3.16	76
4.75	114	4.75	114	3.66	88	3.12	75
4.7	113	4.7	113	3.62	87	3.08	74
4.66	112	4.66	112	3.58	86	3.04	73
4.62	111	4.62	111	3.54	85	3	72
4.58	110	4.58	110	3.49	84	Less than 3	Not enough
4.54	109	4.54	109	3.45	83		
4.5	108	4.5	108	3.41	82		

The maximum amount of points a student can score for the exam equals 80 points.

The minimal amount of points that a student can score – is not less than 50 points.

The grade in the discipline is defined as the sum of points for current educational activities (minimum 72 points) and points obtained by the student in the exam (minimum 50). It is expressed on a multi-point scale (minimum 122 points - maximum 200 points).

Points for the discipline are converted according to the 4-point (national) scale.

Points for the discipline	Score (according to the 4-point scale)
From 170 to 200 points	5
From 140 to 169 points	4
From 139 to minimal amount of points required	3
Less than minimal amount of points required	2

Points of the students who study the same specialty, taking into account the number of points earned from the discipline, are splitted on the ECTS scale as follows:

ECTS grade	Statistical index
A	Top 10 % students
B	Next 25 % students
C	Next 30 % students
D	Next 25 % students
E	Lowest 10 % students

Ranking with the assignment of the grades «A», «B», «C», «D», «E» is made for those students of the educational year, who study the same specialty and have successfully completed the mastering of the discipline. Students who received the «FX» and «F» («2») grades are not included in the ranking list of students. Students with an «FX» score automatically receive an «E» grade upon the re-exam.

13. Methodical providing:

- Educational content.
- Lecture presentations.
- Tables.
- Thematic plans of lectures and practice lessons.
- Practice guidelines for teachers and student tutorials to prepare for practical lessons.
- Control questions, MCQ test questionnaires, problem and situational cases.
- Electronic expert systems.

14. Recommended literature

MAIN SOURCES

1. Zimenkovsky A. Medical psychology. – Svit Publishing House, 2021. 312 p.
2. Clinical pharmacology: a textbook / E.I. Shorikov, G.I Shumko, O.S Khukhlina et al. – Vinnytsia: New Book, 2019. 512 p.
3. Clinical pharmacology. Practical manual / Samura B.B., Kraydashenko O.V., Samura B.A., Samura I.B., Kovalchuk N.M., Yakovleva O.O. – Vinnitsa: New Book, 2010. 191 p.
4. Clinical Pharmacology / O.Ya. Babak, O.M. Belovol, I.S. Chekman. – K: Medicine, 2010. 760 p.
5. Clinical Pharmacology: Textbook / Bilovol O.M. (ed.). – Vinnitsa: New Book. 2021. 684 p.
6. Clinical Pharmacology / Samura B.B., Kraydashenko O.V., Galaeva Y.Y., Nalyotov S.V., Grin A.K.et al. – Donetsk: Weber, 2009. 181 p.
7. Clinical Pharmacy (pharmacy care): a textbook / Edited by V.P. Chernih, I.A. Zupanets. – Golden Pages, 2011. 703 p.
8. Clinical Pharmacy / Zupanets I.A., Chekman I.S., Popov S.B., Nalyotov S.V., Propisnova V.V. et al. – Golden Pages, 2010. 183 p.
9. The novel glossary of clinical pharmacy: a textbook / Zimenkovsky A.B. et al.– Lviv, 2013. 517 p.
10. Fundamentals of Clinical Medicine: Symptoms and Syndromes in Practical Pharmacy / I.A. Zupanets, S.B. Popov, Yu.S. Rudyk and others; Edited by V.P. Chernykh, I.A. Zupanets. – Golden Pages, 2010. 92 p.

11. Fundamentals of clinical pharmacy. Textbook for students of pharmacy and medicine./ M. Drozd, M. Herbet, B. Yakubovska-Solyarska, et al.; Edited by prof. Anna Veli-Goenska, prof. Stanislav Chuchvar, prof. Andriy Zimenkovsky. – Lviv, 2015. 528 p.
12. Perederiy V.G., Tkach S.M. Fundamentals of Internal Medicine. In 2 parts. – Vinnitsa: The New Book, 2018. Part 1. 640 p., Part 2. 784 p.
13. Protocols of a pharmacist on dispensing over-the-counter medicines: doctor's guide / Complited by Bezditko N.V., Blicher V.Ye., Zimenkovsky A.B., Zupanets I.A., Lishchyshyna O.M. et al. – Doctor-Media LLC, 2011. 250 p.
14. Pharmacotherapy: a textbook for pharmacy students / Edited by O.V. Kraydashenko, I.G. Kupnovytska, I.M. Klishtch, V.G. Lyzogub. – New Book, 2010. 644 p.
15. Khukhlina O.S., Tkach E.P., Chursina T.Ya. et. al. Pharmaceutical Care: Selected Issues. – New Book, 2011. 424 p.

ADDITIONAL SOURCES

1. Internal medicine: textbook / Sabadyshyn R.O., Smolyak V.R., Gashinskaya O.S. – New Book, 2019. 528 p.
2. Davtyan L.L., Zagoriy G.V., Voronenko Y.V., Koritnyuk R.S., Voitenko G.M. Drug interaction and drug safety: a guide. – Bludchyy M.I., 2011. 744 p.
3. Denisyuk V.I., Denisyuk O.V. Evidence-Based Internal Medicine: A Textbook for Higher Medical Students. – SC SCF, 2011. 928 p.
4. Clinical Pharmacogenetics / Yakovleva O.O., Konovalova N.V., Kosovan A.I., Stopinchuk O.V., Semenenko S.I. – New Book, 2011. 159 p.
5. Kornatsky V.M., Silantieva O.V. Ethical aspects of drug research in Ukraine. – 2010. 264 p.
6. Emergency medical care / Edited by F.S. Glumcher, V.F. Moskalenko. – Medicine, 2006. 632 p.
7. Drugs side effect: a textbook for students / I.F. Belenichev, N.O. Gorchakova, N.V. Bukhtiyarova, et al. – Vinnytsia: New Book, 2021. 360 p.
8. Adverse reactions of cardiovascular medicines textbook / Chekman I.S, Viktorov O.P., Gorchakova N.O. et al. – K., 2010. 87 p.
9. Anti-infective drugs: a textbook / O.V. Kraidashenko, E.P. Tkach, R.V. Stets et al.; edited by prof. O.V. Kraidashenko. – Vinnytsia: Nova Kniga, 2015. 424 p.
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11. Smetanina K.I. Pharmaceutical care for geriatric patients. – Lviv: T. Soroka Publishing House, 2011. 117 p.
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13. Pharmaceutical Encyclopedia. Issue 2 (editorial board: V.P. Chernykh (chairman) et al. – Morion, 2010. 1631 p.
14. Pharmaceutical care when using contraceptives: textbook / Vdovichenko Yu. et al. – Book plus, 2010. 176 p.
15. Aghaebe O.R., Azuka C.O. Assessing the quality of pharmaceutical care in an outpatient pharmacy. – Lambert Academic Publishing, 2016. 176 p.
16. Alistair H.G., Wright J., Lynn B., Oakley J. Clinical Pharmacy. Pocket Companion. 2015. 568 p.
17. Alves da Costa F., van Mil J.W.F., Alvarez-Risco A. The Pharmacist Guide to Implementing Pharmaceutical Care. – Springer Cham, 2019. 506 p.
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19. Cobert B., Gregory W., Thomas J.-L. Cobert's Manual of Drug Safety and Pharmacovigilance. – World Scientific Publishing Co, 2019. 410 p.
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21. Gad C.S., Sullivan J.W.D. Drug Safety Evaluation. – Wiley, 2023. 992 p.
22. Gautier J.-C. Drug Safety Evaluation. – Humana New York, 2017. 427 p.
23. Goodman & Gilman's. The Pharmacological Basis of Therapeutics / Laurence L. Brunton, Jons S.

- Lazo, Keith L. Parker. – McGraw-Hill Medical, 2006. 2021 p.
24. Hayes W. Clinical Pharmacy. – Foster Academics, 2019. 239 p.
 25. Katzung B., Trevor A. Basic and Clinical Pharmacology. 15th Edition. – McGraw Hill / Medical. 2020. 1328 p.
 26. Khan M. Essence of Clinical Pharmacy. – Nova Science Publuser, 2022.
 27. Kumar D.S., Krishnaveni J., Manjula P. Fundamentals of Clinical Pharmacy Practice. – BSP books. 2018. – 845 p.
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 29. Nathan A. Managing Symptoms in the Pharmacy. 2020. 240 p.
 30. Nathan A. Non-Prescription Medicines. 2020. 320 p.
 31. Parthasarathi G., Nyfort-Hansen K., Nahata M.C. A Textbook of Clinical Pharmacy Practice: Essential Concepts and Skills. – University Press, 2012. – 596 p.
 32. Shanka K.R., Kiranmayi G.V.N. Clinical Pharmacy and Pharmacotherapeutics. 2nd ed. – Pharmamed Press, 2019. 1154 p.
 33. Sharma R., Mishra A. Handbook of Hospital and Clinical Pharmacy: Reference book of Hospital & Clinical Pharmacy. – LAP LAMBERT Academic Publishing. 2018. 104 p.
 34. Sherif Hanafy Mahmoud Patient Assessment in Clinical Pharmacy. – Springer Cham, 2019. 439 p.
 35. Siddiqui A.A., Siddiqui S. A textbook of hospital and clinical pharmacy. 2ed. – CBS Publishers & Distributors CBS, 2018. 318 p.
 36. Turner P. Pharmaceutical care practice. The patient centered approach to medication management. – Medicare health science, 2021. 243 p.
 37. Yadav A.V., Yadav B.V., Shaikh T.I. Hand Book of Clinical Pharmacy. 2019. 181 p.

15. Information resources:

- Internal diseases: a portal for doctors. – Access mode: <http://empendium.mp.pl/ua/>
- State Drug Formulary. Issue 1, Issue 2, Issue 3, Issue 4, Issue 5, Issue 6, Issue 7, Issue 8, Issue 9, Issue 10, Issue 11, Issue 12 / edited by V.T. Chumaka, V.I. Maltsev, A.M. Morozov, V.D. Pariy, A.V. Stepanenko. – K.: Morion.
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- Clinical trials in Ukraine. – Access mode: <https://crupp.org/uk/>
- Medicines in Ukraine. – Access mode: <https://xn--h1adc2i.xn--j1amh/>
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