	CD 8.5.1 SYLLABUS	Edition:	09
		Date:	15.09.2021
		Page 1/10	

FACULTY OF MEDICINE

STUDY PROGRAM 0912.1 MEDICINE 2

PHARMACOLOGY AND CLINICAL PHARMACOLOGY DEPARTMENT

APPROVED
at the meeting of the Board of quality assurance and curriculum evaluation of the Faculty of Stomatology
Minutes No. 1 dated on 23.09.2021
Chairman _PHD, Associate Professor

APPROVED
at the meeting of the Council of Faculty of Stomatology
Minutes No. 2 dated on 12.10.2021
Dean of the Medicine nr. 2 Faculty
Associate Professor
Solomon Oleg

APPROVED
At the meeting of the Committee of the department of pharmacology and clinical pharmacology
Minutes No. 3 of 15.09.2021
Head of department PHD, Associate Professor
Bacinschi Nicolae

CURRICULUM

DISCIPLINE **DENTAL CLINICAL PHARMACOLOGY**

Integrated studies

Type of the course: **Compulsory discipline**

Curriculum developed by the team of authors:

Bacinschi Nicolae, PhD,dr. of med., professor
Țurcan Lucia, PhD,dr. of med.,associate professor
Podgurschi Lilia, PhD,dr. of med.,associate professor
Guțu Ina, university assistant
Chianu Marin, university assistant
Mihalachi-Anghel Maria, university assistant

Chisinau, 2021

I. PRIMARIES

- **General presentation of the discipline: the place and role of the discipline in the formation of the specific competences of the professional / specialty training program**

  Clinical pharmacology is a clinical and applied discipline that at the university stage will allow the future doctor to acquire the pharmacokinetic, pharmacogenetic and pharmacodynamic principles of characterization of drug groups, in order to apply knowledge to assess efficacy and harmlessness, rational selection of drugs. The study of the discipline will allow the student to argue the appropriate selection of drugs for the particular patient and to assess the rightness of the indications made in accordance with the standards and clinical guidelines of diagnosis and treatment.

  In order to acquire clinical pharmacology, deep knowledge in the field of medical-biological disciplines are required (anatomy, physiology, histology, biochemistry, pathophysiology, morphopathology, microbiology, fundamental pharmacology) and clinical, internal medicine, surgery, infectious diseases, pediatrics, endocrinology, neurology and dental disciplines: pediatric oro-maxillo-facial, pedodontics and orthodontics; oro-maxillo-facial and oral implantology, dentistry, periodontology and oral pathology; dental propaedeutics; orthopedic dentistry and therapeutic dentistry, etc.

  The mission (purpose) of the curriculum in professional training

  The basic aim of clinical pharmacology is to develop students' ability to apply the knowledge about pharmacokinetics, pharmacodynamics, compatibility and side effects of drugs for a rational and differential treatment of the patients.
- **Language/languages of teaching the discipline:** Romanian, Russian, English;
- **Beneficiary:** students of the 4th year, Faculty of Stomatology.

II. DISCIPLINE ADMINISTRATION

Discipline code		**S.07.O.086**	
Discipline denomination		**Dental Clinical pharmacology**	
Responsible (s) of the discipline		**PhD of Medicine, professor Bacinschi Nicolae**	
Year	**4th**	Semesters	**7th**
Total number of hours, including:			**53 hours**
Course	**6 (12 hours)**	Practical/laboratory works	**10 hours**
Seminars	**6 (20 hours)**	Individual work	**11 hours**
Evaluation form	**Differentiated test**	Number of credits	**2**

III. DISCIPLINE TRAINING OBJECTIVES:

At the end of the course, the student will be able to:

- ***At the level of knowledge and understanding, the student must identify:***

  - clinical pharmacology departments and their importance;
  - basic principles of clinical pharmacokinetics, pharmacogenetics and pharmacodynamics;
  - study fields of pharmacoeconomics, pharmacoepidemiology, pharmacovigilance, pharmacotoxicology, chronopharmacology and social pharmacology;
  - the principles of classification of drugs (by activity, duration of action, toxicity, clinical use, etc.);
  - mechanisms of action at the molecular and systemic level, pharmacological effects and appropriate clinical manifestations;
  - the indications, principles for the selection and use of the groups of drugs,

- contraindications, side effects and precautions for the groups of drugs and the mandatory and essential drugs;
- to describe the etiotropic, pathogenetic and symptomatic action of the drugs in the pharmacotherapy of diseases and pathological conditions;
- to define individually the appropriate dosage regimen and the ways of administration of drugs depending on the disease and the pathology state of the body;
- to describe the patient's medical history, to identify the drug surveillance system;
- to list the essential and vital important drugs;
- to list the OTC drugs and self-medication;
- to identify the principles of elaboration and design of the national and institutional therapeutical form, diagnostic and treatment medical economic standards, the national and institutional clinical guidelines;
- to describe the principles of personalized medication.

- ***At the level of application:***

- to select the first choice (first line) drug for an optimized treatment;
- to assess the prescription of drugs to the patient, based on the pharmacokinetic, pharmacogenetic and pharmacodynamic properties of the drug, and as well as on the individual particularities of the patient;
- to sketch an optimal dosage regimen, selecting rational ways of administration depending on the pharmacodynamics, pharmacokinetic parameters of the drug, and the age, gender, and pathological conditions of the particular patient;
- to recommend the administration of the most effective and harmless drug associations in the particular clinical situation;
- to assess the development and use of methods to prevent or correct the side (secondary) effects of drugs;
- to apply the principles of P-drug selection and P-treatment in the particular patient;
- to determine the criteria of efficacy and harmlessness of the drug groups;
- to select the information about the drugs that is useful for the patient in order to improve compliance and observance of the administration regime;
- to apply in practice the surveillance system of drugs;
- to indicate the criteria for monitoring the effect of drugs;
- to sketch the possible drug interactions and their consequences.

- ***At the integration level:***

- to assess the importance and place of clinical pharmacology among clinical disciplines;
- to identify the necessity of clinical pharmacology in order to establish rational and harmless treatment;
- to analyze the results of the pharmacokinetic and pharmacodynamic investigations of the drugs;
- to select the necessary complex of investigative methods to assess the pharmacodynamic effects of drugs and the analysis of the obtained results;
- to analyze and synthesise the pharmacological and pharmacotherapeutic information from the specialty literature in accordance with evidence-based medicine;
- to formulate principles of ethics and deontology in performing pharmacotherapy;
- to select the criteria of efficacy and harmlessness of drugs for justifying the expected treatment;
- to analyze the pharmacotherapy of various diseases and illnesses based on unified diagnostic and treatment standards;
- to survey the efficacy and harmlessness of drugs in the pharmacotherapy process;

- to implement the criteria for monitoring the drug treatment during the study of clinical disciplines;
- to develop scientific research projects in the field of clinical pharmacology.

IV. PREVIOUS CONDITIONS AND REQUIREMENTS

Clinical pharmacology is a clinical and applicative discipline that at the university level will enable the future doctor to acquire the pharmacokinetic, pharmacogenetic and pharmacodynamic principles of drug groups characterization in order to apply knowledge to the assessment of efficacy and harmlessness, rational selection of preparations. The study of the discipline will allow the student to argue the appropriate selection of the drugs for the particular patient and to appreciate the correctness of the indications made in accordance with clinical diagnostic and treatment standards and protocols.

Profound knowledge in the field of medical and biological disciplines (anatomy, physiology, histology, biochemistry, physiopathology, morphopathology, microbiology, fundamental pharmacology) and clinical (internal medicine, surgery, infectious diseases, pediatrics, endocrinology, neurology, obstetrics and gynecology, stomatological disciplines, etc.) is required to master the clinical pharmacology.

In addition, it is necessary for the student to master the information technologies (use of the Internet, document processing, electronic tables and presentations, use of graphic programs) at an adequate level, the communication skills and teamwork, as well as being tolerant, compassionate and autonomous.

V. THEMES AND ESTIMATE ALLOCATION OF HOURS

Courses (lectures)- L, practical works – P/W, laboratory works/seminars - S and individual work – I/W

No.	Topics	Number of hours			
		L	P/W	S	I/W
A.	LECTURES				
1.	Clinical pharmacology of anxiolytics, sedatives-hypnotics, antipsychotics nootropics, antidepressants and anticonvulsivants in stomatology	1			
2.	Clinical pharmacology of anti- inflammatory, anti-allergic and influencing the immune processes drugs.	2			
3.	Clinical pharmacology of drugs used in disorders of coagulation. Plasma volume expanders.	2			
4.	Clinical pharmacology of antibiotics and chemotherapeutic drugs in stomatology.	2			
5.	Pharmacokinetics and pharmacodynamics principles of rational using of remedies that influence the oral mucosa and tooth pulp.	2			
6.	Emergency pharmacotherapy in accesses of angina pectoris, hypertensive emergency, acute hypotension, accesses of migraine, pulmonary edema, cerebral edema hypo- and hyperglycemia, intestinal colic, biliary and renal colics , thyrotoxic crisis.	2			
7.	Stomatological pharmacotherapeuthical complications. Drugs interactions	1			
B.	PRACTICAL WORKS AND SEMINARS				
	Pharmacokinetics and pharmacodynamics principles of rational usage of analgesics, general and local anesthetics, sedatives, hypnotics, tranquillizers, antidepressants, antipsychotics and nootrops.		3	2	1
2.	Pharmacokinetics and pharmacodynamics principles of rational using of anti- inflammatory, anti-allergic and influencing the immune processes		3	2	2

	drugs.				
3.	Pharmacokinetics and pharmacodynamics of rational usage of drugs used in disorders of coagulation. Plasma volume expanders.		3	2	2
4.	Pharmacokinetics and pharmacodynamics principles of rational usage of chemotherapeutic drugs.		3	2	2
5.	Pharmacokinetics and pharmacodynamics principles of rational using of remedies that influence the oral mucosa and tooth pulp.		3	2	2
6.	Pharmacokinetics and pharmacodynamics principles of rational using of remedies that influence the general metabolism and phosphorus-calciun metabolism. Vitamins, enzymes and anti-enzymes		3	2	2
Total		**12**	**18**	**12**	**11**

VI. REFERENCE OBJECTIVES AND CONTENTS UNITS

Objectives	**Contents units**
Theme 1.	
• To define the minimum complex of investigation methods for assessing the pharmacodynamic effect of the anti-inflammatory, anti-allergic and immune-acting drugs. • to demonstrate the analysis and assessment of the results of pharmacodynamic studies of anti-inflammatory, anti-allergic and immune-acting drugs • to select the most effective, harmless and acceptable drugs for patients • to predict identify the possible complications and side effects of drugs from these groups • to evaluate the dependence of possible side effects on the dosing regimen and the functional status of the organs and systems of the body • to apply contemporary methods of pharmacological and non-pharmacological correction of side effects caused by anti-inflammatory, anti-allergic and immunomodulatory drugs • to sketch the personal drug form (drug-P)	Pharmacokinetic and pharmacodynamic principles of rational use of anti-inflammatory, anti-allergic and immune-acting drugs. Providing emergency medical care in various immediate allergic reactions. Selection of personal drugs.
Theme 2.	
• to identify the minimum complex of investigation methods in order to assess the pharmacodynamic effect of analgesics, local and general anesthetics, drugs with influence on the CNS: sedatives, hypnotics, tranquilizers, neuroleptics, antidepressants and nootropics. • to demonstrate abilities to fight the pain syndrome, to predict the possible complications and side effects of the drugs from the studied groups. • to demonstrate knowledge in the field of pharmacodynamics and pharmacokinetics of general and local anesthetics, opioid analgesics and antipyretics. • to determine the importance of pharmacological effects (sedative, anxiolytic, potentiation of analgesia, etc.) with beneficial action in various dental interventions or in the treatment of diseases of the	Pharmacokinetic and pharmacodynamic principles of rational use of analgesics, general and local anesthetics. Pharmacokinetic and pharmacodynamic principles of rational use of sedative, hypnotic, tranquilizing and neuroleptic drugs. Acquiring the pharmacodynamics and pharmacokinetics of general and local anesthetics, opioid analgesics, antipyretics, hypnotics, sedatives, tranquilizers,

Objectives	Contents units
oral cavity, oro-maxillo-facial region, or in some states of emergency (convulsions, psychomotor agitation, fever, sleep disturbances, etc.). • to apply the analysis and to appreciate the results of the study of the pharmacodynamics of drugs, obtained by laboratory and instrumental methods • to predict the dependence of side effects on the dosing regimen and the functional state of the body's organs and systems • to apply contemporary methods of prophylaxis and treatment of side effects of drugs • to predict the interaction of analgesic, local and general anesthetic drugs, with influence on the CNS, including psychotropic drugs, with each other and with other drugs.	neuroleptics, antidepressants and nootropics, for the reasoned and harmless performance of premedication and dental interventions. Selection of personal drugs. Selection of effective and harmless associations, necessary for performing a dental treatment or manipulations accompanied by fear, anxiety and pain. Provide emergency assistance in vital pathological conditions.
Theme 3.	
• to select the minimum complex of investigations, in order to assess the pharmacodynamic effect of hemostatic and antithrombotic drugs, blood substitutes and plasma volume • to demonstrate the correct selection of hemostatic and antithrombotic treatment, the application of the principles of rational use and dosage of drugs, depending on the type and severity of bleeding and thrombosis. • to name the principles of interaction of hemostatic and antithrombotic drugs with other groups of drugs and to predict possible side effects • to predict the dependence of side effects of the studied drugs, on the dosing regimen and the functional state of the organs and systems of the organs • to apply contemporary methods of pharmacological correction of side effects caused by hemostatic and antithrombotic drugs • to sketch the personal form (drug-P) of this group of drugs • to integrate the principles of medication dosing, depending on the group membership and the disease	Pharmacokinetic and pharmacodynamic principles of drugs with action on platelet aggregation, blood clotting and fibrinolysis. Plasma volume substituents.
Theme 4.	
• to describe the mechanisms of action and the particularities of the action of antibiotics, synthetic antibacterial chemotherapeutics, antiviral and antifungal drugs for their rational selection • to evaluate the importance of the efficiency and harmlessness problem of chemotherapeutic drugs in infectious conditions with severe evolution, caused by resistant germs to antimicrobial, antiviral and antifungal drugs • to demonstrate analysis skills and assessment of the results of microbiological, laboratory and instrumental methods, to determine the effectiveness of drugs and to correct the specific treatment • to evaluate the possible complications and side effects of drugs • to evaluate the dependence of the adverse phenomena of the drugs	Pharmacokinetic and pharmacodynamic principles of rational use of antibacterial chemotherapeutics. Acquiring the clinical-pharmacological principles to argue the prescription, dosing methods and assessing the efficacy of drugs with antimicrobial effect. Selection of personal drugs.

Objectives	Contents units
on the dosage regimen and the functional state of the organs and systems of organs. • to sketch the form of personal drugs (drug-P).	
Theme 5.	
• • to identify the minimum complex of investigations, in order to assess the pharmacodinamic effect of drugs with action on the mucosa of the oral cavity, the dental pulp; • • to analyze and evaluate the results of the study of the pharmacodynamics of certain drugs; • • to evaluate the possible complications and side effects of the drugs from this group; • • to estimate the performance of an effective and harmless treatment of various dental conditions; • • defining the clinical-pharmacological principles of individualisation and optimization of the rational administration of drugs with influence on the mucosa of the oral cavity and the dental pulp; • • to apply the principles of choice and dosage of drugs depending on the disease, age and particularities of drugs; • • assess the dependence of side effects on drugs from this group; • • to support the performance of an effective and harmless treatment of various dental conditions; • • to apply contemporary methods of pharmacological correction of side effects caused by drugs. • • application of the principles of choice and dosage of drugs depending on the disease, age and particularities of drugs; • • to sketch the personal form (P-drugs) in the conditions accompanied by diseases of the oral mucosa and dental pulp.	Pharmacokinetic and pharmacodynamic principles of rational use of drugs with influence on the mucosa of the oral cavity and the dental pulp. Selection of personal drugs.
Theme 6.	
• to define the pharmacodynamic and pharmacokinetic particularities of drug groups with influence on general and phosphorocalcic metabolism, fluorine-containing drugs. Vitamins, co-ferments. Enzymes and antienzymes.• to analyze and evaluate the results of pharmacodynamic study of these drugs; • to demonstrate skills in evaluating the personal form (P-drugs). • to confirm that these substances can be used as remedies to correct metabolism in various diseases and pathological conditions and that they can be called remedies for metabolic therapy, often applied in dental practice. • defining the clinical-pharmacological principles for arguing the prescription, selection, dosing and assessment of the efficacy of drugs with action on general metabolism, phosphorus-calcium and fluorine-containing drugs. • to apply methods of pharmacological and non-pharmacological correction of side effects caused by medicinal products with metabolic effect	Complications of drug treatment in dentistry. Knowledge of the complications of drug therapy and side effects from the oral cavity, caused by different groups of drugs used in dentistry. Clinically significant drug interactions. Acquiring the necessary measures to prevent and manage emergencies.

Objectives	Contents units
• apply the prediction of possible side effects, determine their dependence on the dosing regimen. • to support the performance of an effective and harmless treatment of various dental conditions • to integrate the principles of medication dosing, depending on the group membership and the respective disease. • to identify a minimum complex of investigation methods, in order to assess the modification of the pharmacodynamic effect by the pharmacokinetic and pharmacodynamic drug interactions. • Complications of drug therapy in dentistry • to analyze and assess the results of the pharmacodynamics of different drugs taking into account the possible interactions between them • to assess the dependence of side effects on the dosing regimen and the functional status of the organs and systems of the body • to apply contemporary methods of pharmacological and non-pharmacological correction of side effects. • to define and apply the principles of treatment and prophylaxis of intoxications with drugs and toxic substances • to apply emergency pharmacotherapy in case of anaphylactic shock, Quincke's edema, angina attacks, hypertensive emergency, acute hypotension, migraine attacks, pulmonary edema, hypo- and hyperglycemic coma, cerebral edema.	

VII. PROFESSIONAL (SPECIFIC) (SC) AND TRANSVERSAL (TC) COMPETENCES AND STUDY FINAL

✓ **Professional (specific) competences (SC)**

- PC1. Selection of drugs and argumentation of their prescription to patients based on the pharmacokinetic, pharmacogenetic and pharmacodynamic properties of the drug, as well as the individual characteristics of the patient;
- PC2. Determining the optimal dosage regimen of drugs, with the selection of rational routes of administration depending on the pharmacodynamics, pharmacokinetic parameters of the drug, and the age, gender and pathological conditions of the patient, in order to improve compliance and the administration regimen;
- PC3. Determining the criteria of efficacy and harmlessness of drug groups and, based on them, selection of P-drugs and P-treatment in the specific patient;
- PC4. Selection of the necessary set of research methods for estimating the pharmacodynamic effects of drugs and interpreting the data obtained.
- PC5. Assessment of possible drug interactions and their consequences (favorable or detrimental).
- PC6. Monitoring and assessment of the efficacy and harmlessness of drug treatment, including prognosis, prophylaxis and treatment of adverse (side) effects of drug substances in the specific clinical situation;
- PC7. Implementation in practice of the drug surveillance system.

✓ **Transversal competences (TC)**

- TC1. Preparing for abstract thinking, analysis, synthesis.

- TC2. Improving the capacity for decision-making autonomy.
- TC3. Formation of personal attitude.
- TC4. Ability for social interaction, group work with different roles.
- TC5. Framing in interdisciplinary projects, extracurricular activities.
- TC6. Improving digital skills.
- TC7. Development of different learning techniques.
- TC8. Selection of digital materials, critical analysis and formulation of conclusions.
- TC9. Presentation of individual scientific projects.

✓ **Study final**

- At the end of the cycle, the student must have extensive knowledge in the classification and basic characteristics of drugs, the affiliation of drugs to certain groups, the pharmacodynamics and pharmacokinetics of drugs, indications and contraindications for the use of drugs; side effects of drugs.
- The student must be able to analyze the action of drugs in terms of all their pharmacological properties, to select the most effective and harmless drugs, to evaluate the possibility of using drugs for diagnosis, prophylaxis and treatment; to use drugs in certain pathological conditions based on pharmacodynamic, pharmacokinetic, chronopharmacological characteristics and the particularities of the action of drugs in different age groups, in patients with various comorbidities and pregnant women, to predict the interaction of drugs and their biotransformation in the body.
- The student must accumulate the skills necessary to evaluate the possibility of using drugs for the treatment and prevention of various diseases and pathological conditions.
- At the end of the cycle the student will have to prepare the personal form of the drugs

VIII. INDIVIDUAL WORK OF THE STUDENT

No.	Expected product	Implementation strategies	Evaluation criteria	Deadline
1.	Brief characterization of the main drug preparations	Based on the material presented in module of the methodical guidelines for practical clinical pharmacology, using clinical protocols, pharmacotherapeutic form and drug guides, the student will accumulate, systematize and drawn up his list of mandatory drugs, which shall include: common international name of the drugs, synonyms, forms of delivery, mode of administration, (therapeutic, maximal) doses, indications, contraindications, side effects.	The volume of work, the presence of the characterization of all the drugs specified in the methodical indications, the sources used for accomplishing the individual work, the student shall know all the presented things.	Throughout the module
2.	Medical recipe exercises	Based on the methodical guidelines for practical clinical pharmacology and using the drug guides (including the use of a brief characterization of his own main drugs), the student will prescribe the mandatory drugs in all delivery forms, with mandatory indication of the appropriate dosage regimen and disease in the instruction.	The volume of work, the presence of prescriptions for all medicines and their forms of delivery, the observance of the rules of drug prescription, the quality of instruction, the ability of the student to prescribe the drug to another patient with possible other illness and / or comorbidities	Throughout the module

			and physiological particularities.	
3.	Selection of drugs according to the criteria of effectiveness, harmlessness, acceptability and cost, for inclusion in the personal form (P drugs)	It will be performed on the basis of the methodology specified in the annex "METHODOLOGICAL INDICATIONS ON THE RATIONAL SELECTION OF DRUGS" of the "Methodical indications for practical works in clinical pharmacology", with prior examples during practical classes and using the contemporary bibliographical sources (manuals, guides, protocols, publications).	Volume of work, quality of used sources, student argumentation of P drug selection, lack of plagiarism.	Throughout the module

IX. METHODOLOGICAL SUGGESTIONS OF TEACHING-LEARNING-EVALUATION

- ***Methods used in teaching and learning***

Clinical pharmacology is taught according to the classical principles of university studies (instruction), using the methods: exposure, interactive lecture, heuristic conversation, problem-solving, brainstorming, group work, individual study, work with textbook and scientific text, debate, solving problem situations, role play, simulation, interactive listening.

- ***Applied didactic strategies/technologies***

Theoretically selected material from the literature, which is not contained in the available literature shall be taught at the lectures. At the seminars, the students will deepen their theoretical knowledge, will demonstrate the abilities of prescribing the drugs in the appropriate medicamentous forms; will fulfill the patient's clean-up protocol; will argue the prescription of elective drugs to the particular patient; will elucidate the pharmacological effects of prescribed drugs and will monitor the evolution of the clinical condition of the particular patient; will select the personal medicine (P-drug) based on the criteria of effectiveness, harmlessness, acceptability and cost; will determine drug administration schedules (P-treatment); will have the ability to fill in the information sheet on drugs side effects.

Didactic-methodical assurance for individual work in the discipline „clinical pharmacology".

Non-auditory preparation for individual work:

1. Preparing for lessons, seminars and practical works
2. Literature review (articles and monographs)
3. Study of methodical guidelines
4. Study within the discipline of additional topics not included during lessons and seminars
5. Elaboration of thematic reports on the selected issues
6. Independent work with clinical cases
7. Preparing for participation in scientific and practical conferences
8. Elaboration of presentations and papers for participation in the scientific circle

Auditory preparation for individual work:

1. Development of practical skills with the use of treatment algorithms, tables
2. Discussion of reports and essays
3. Work with guidances and guides and other specialty literature
4. Defense of elaborated papers
5. Solving of problems and clinical cases

6. Work with protocols and clinical treatment standards
7. Virtual work.

Provision of the technical-material basis

A classroom (of 30 m^2) of therapies departments, laboratories and auditors will be provided as a material basis. Computer assurance and internet connection. Information technologies for the clinical pharmacology course will be used in lectures, seminars, practical works and for individual work. Tables, computers, projectors, and drug information (administration instructions) will be used to assimilate the discipline. List of tables, movies and virtual programs are available. The student's independent work consists in studying the sources of textbooks recommended both in hard copies and electronic ones, lectures, as well as studying specialty literature using the Internet.

Provision of teaching materials

In order to ensure the didactic process, both the traditional and the innovative methods will be used:
-course (lecture) -view
- seminar-conference
- working in small groups
- discussion of clinical cases (including clinical models of development of drug side effects)
- elaborating and presenting the patient's treatment sheet
- developing and analyzing the patient's list of prescriptions
- solving the situation problems
- participation in clinical conferences and councils
- participation in clinical and scientific conferences and symposia
- the student's scientific and research work
- preparing and presenting the essays

The indicated methods can be used independently or in combination. The course of theoretical lessons will be presented in the Power Point program.

A part of the lectures are in the form of discussion and presentation of clinical cases. At the same time during the lectures, the patients' microcuration sheets will be elaborated and presented, with a thorough analysis of the list of prescriptions of medicinal products and the selection of personal drugs, with the appreciation of the activity given by the teacher.

The treatment analysis can also be analysed at the last seminar with discussion in working groups.

Seminars in the form of a clinical conference have found application in disciplines that have clinical genetics questions.

The themes of the discipline, including the topics related to the provision of emergency medical aid, are supplemented by clinical cases solving.

Students under the supervision of teachers will carry out scientific and research work, with subsequent participation in practical and scientific conferences and symposia, including the Annals of the University.

The student's scientific and research work will include the patient's case reports and elaboration of personal drug form. The drug treatment analysis will be performed based on the pharmacodynamic and pharmacokinetic parameters of the drugs. The personal selection of the medicines will be based on the criteria of effectiveness, harmlessness, acceptability and price. On the basis of the analysis carried out, recommendations will be made regarding the optimization of the drug treatment. In practical works, students will apply formulas to calculate basic pharmacokinetic parameters with an indication of their clinical significance.

Students will gain knowledge concerning prognosis, diagnosis, treatment and communication of drug side effects. They will be familiar with the legal bases of the given topic and the methods of communication and reporting of drug avers reactions (DAR), as well as working with databases and specialty literature.

The results of the student's scientific and research work are reported at seminars as well as in conferences and symposiums,
In order to motivate students and to understand the connection between the given discipline and future specialties that shall be selected, students will participate in clinics conferences, councils, complicated cases commissions, with the appreciation of drug treatment and drug prescription.
Upon request, students can prepare scientific papers on selected topics for further analysis. The topics of the papers are available at the chair.
The interactive form of this work will constitute 5%.
The elaboration and execution of the student's scientific and research work, the reports, the patient's case reports, the analysis of the drug treatment, all contribute to the development of practical skills regarding the rational use of drugs in specific cases for patients with various pathologies of organs and systems, as well as the management of medical emergencies situations.
At the same time, students will gain knowledge on legislation of the drug field, formulation system, the National and Institutional Pharmaco-Therapeutic Form (PhThF), the Essential Drugs List, the application of principles of evidence-based medicine, thus all of which will contribute to the development of professional skills.

- ***Methods of assessment*** *(including the final grade calculation method)*

Clinical Pharmacology discipline uses the following forms of assessment during the study:

A. Current:

- Test of primary knowledge of the course;
- Test of final knowledge of the course;
- Interactive discussion;
- Preparation of the treatment protocol;
- Solving clinical cases;

B. Final

- differentiated test.

Test of primary knowledge of the course includes medical recipe exercises, tests and general theoretical questions. Test of final knowledge of the course contains correlation tests, problem situations that need to be analyzed, and the application of the knowledge gained from self-training and interactive discussion. The clinical protocol (research paper) provides for the analysis of the medical treatment prescribed to the patient based on the knowledge gained in the self-instruction process, the interactive discussion, the solving of the clinical cases.

Differentiated test includes 2 variants: the first one- theoretical questions, medical recipe exercises and tests (single and multiple compliment), the second one - tests (30) of different types with 15 medical prescriptions and therapeutic indications.

Methods of mark rounding at the evaluation stages

Intermediate note grid (annual average mark, marks of the exam stages)	National mark system	ECTS equivalent
1,00-3,00	**2**	**F**
3,01-4,99	**4**	**FX**
5,00	**5**	**E**
5,01-5,50	**5,5**	
5,51-6,0	**6**	
6,01-6,50	**6,5**	**D**

6,51-7,00	**7**	
7,01-7,50	**7,5**	**C**
7,51-8,00	**8**	
8,01-8,50	**8,5**	**B**
8,51-8,00	**9**	
9,01-9,50	**9,5**	**A**
9,51-10,0	**10**	

The average annual mark and the marks of all stages of final examination (computer assisted, test, oral) - all will be expressed in numbers according to the evaluative scale (according to the table), and the final mark will be expressed in two decimal digits will be transferred to the student's record book.

Absence on examination without good reason shall be recorded as "absent" and is equivalent to 0 (zero). The student has the right to re-take the exam twice.

X. RECOMMENDED LITERATURE:

A. Compulsory:

1. Clinical Pharmacology (edited by Professor. Ghicavîi V.). Chisinau, 2009.
2. Pharmacology (edited by Professor. Ghicavîi V.). Chisinau, 2010, 2012.
3. Clinical Pharmacology (self-assessment tests). Chisinau, 2000.
4. Ghicavii V. Some aspects of rational use of medicines. Chisinau, 2002.
5. Ghicavii V. et al. Pharmacotherapy of dental diseases. Chisinau, 2014.
6. Bertman G. Kattsung. Basic and clinical pharmacology, 2015.
7. Goodman G. and Gilman G. Clinical pharmacology. 11th edition, M.: 2005.
8. Kharkevich D.A. Pharmacology, textbook for medical students, 2008.
9. Oxford Textbook on Clinical Pharmacology, 2002.
10. Lippincott's Pharmacology, illustrated review, 2015.
11. Rang H.P. Pharmacology, 1999.
12. The pharmacologycal basis of therapeutics, sub redacţia Goodman and Gilmans
13. Methodical indications (Syllabus) for clinical pharmacology practical works / V. Ghicavii et all, 2011.
14. Tests on clinical pharmacology : (for faculty of medicine) / under the editorship of V. Ghicavîi ; State University of Medicine and Pharmacy "Nicolae Testemitanu", Pharmacology and Clinic Pharmacology Department. - Chişinău : Medicina, 2014
15. Clinical case in clinical pharmacology, 2017.
16. Ghicavii V. Drug – benefit or injury. Chisinau, 2009.
17. Ghicavii V. Clinical Pharmacology Service in the Public (curative) Health Institution. Chisinau, 2010.
18. Drugs - basis of rational pharmacotherapy (edited by professor V. Ghicavii). Chisinau, 2013.

B. Additional:

1. Ghicavii V. et al. Antibiotics in otorhinolaryngology. Chisinau, 2001.
2. Pharmacotherapeutic Guide. Chisinau, 2010.
3. Markova I.V. et al. Pediatric pharmacology. M. Medicine, 1991.
4. Mashkovsky M.D. Drugs vol. I and II, Kharkiv, "Torsing", 2006.
5. Rational pharmacotherapy in dentistry. M., 2006.

6. Stratchounski L.S., Belousov Yu.B., Kozlov S.N. Antibacterial therapy. Moscow, 2003.
7. Stratchounski L.S., Belousov Yu.B., Kozlov S.N. Guidelines for rational antibiotic therapy. Moscow, 2007.
8. Clinical pharmacology. National leadership. Moscow, 2009.