Ministry of Public Health of Ukraine
Poltava State Medical University

Department of Pharmacology

SYLLABUS

INTERNAL MEDICINE
(INCLUDING CLINICAL PHARMACOLOGY, CLINICAL IMMUNOLOGY AND ALLERGOLOGY, OCCUPATIONAL DISEASES)

Module 4. Clinical Pharmacology
normative

higher education level	the second (master's) level of higher education
field of knowledge	22 «Healthcare»
specialty	221 «Dentistry»
educational qualification	Master of Dentistry
professional qualification	Dentist
educational and professional program	«Dentistry»
form of education	daily
course (s) and semester (s) of study discipline	4 course 8 semester

Poltava – 2024

THE DATA ABOUT THE TEACHERS TEACHING THE ACADEMIC DISCIPLINE

Full name of the teacher (s), academic degree, academic title	Ruslan Lutsenko, Doctor of Medical Sciences, Professor Kapustnik Yuri Oleksiyovich, PhD, Associate Professor Gryshko Yulia, PhD, Associate Professor
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MAIN CHARACTERISTICS OF MODULE 4. CLINICAL PHARMACOLOGY

The volume of discipline

Credits number/hours 1,0 / 30 from them:
Practical (h.) – 20
Self-work (h.). – 10
Type of control - final modular control

Discipline policy

The Department pharmacology ,clinical pharmacology and pharmacy in studying the discipline adheres to the requirements which are spelled out in the Regulations on academic integrity of higher education seekers and employees of the Poltava State Medical University.

General requirements for higher education seekers include: attending classes (inadmissibility of absences, delays); rules of conduct in pharmacology classes (active participation in the topic, culture of behavior); rules of preparation for practical classes (solving test tasks and situational tasks on the topic of the lesson).

The policy of the department is guided by the provisions of the Ukrainian legislation " About Education", "About Higher Education", the Statute of PSMU and the following Regulations:

Regulation on the organization of the educational process at Poltava State Medical University.

Internal code of conduct for students of Poltava State Medical University.

Regulation on the organization and methods for assessment of educational activities of higher education recipients at Poltava State Medical University.

Regulation on the organization of self-directed work of students at Poltava State Medical University.

The above Regulations can be found in detail at the link
https://www.pdmu.edu.ua/n-process/department-npr/normativni-dokumenti

Description Module 4. Clinical pharmacology (annotation)

Clinical pharmacology is engaged in the study of drugs as applied to humans. It teaches the doctor to choose from all existing an effective and safe drug for individualized therapy and prevention, taking into account the concomitant pathology of the patient. Clinical pharmacology studies the interaction of drugs with the body. The essence of the action of drugs is the formation of a complex with biosubstrates (submolecular and molecular levels). There are two main sections - pharmacokinetics and pharmacodynamics.

Subject of study of Module 4: teach students to perceive the human body as a whole, to highlight the relationship between the pathology of the oral cavity and internal organs, to develop skills for quick examination and emergency care for patients at the prehospital stage and in emergency situations, since the oral cavity is closely connected with various organs and systems.

Prerequisites and Postrequisites Module 4. Clinical pharmacology (interdisciplinary communication)

Prerequisites:

Study of Module 4. Clinical pharmacology is based on the knowledge gained by students in the study of the following disciplines: Ukrainian language (in the professional field): Philosophy. Latin language and medical terminology. Medical biology. Medical and biological physics. Medical chemistry. Biological and bioorganic chemistry. Human anatomy. Histology, cytology and embryology. Foreign (for professional purposes). Physiology. Microbiology, virology and immunology. Propaedeutics of internal medicine. Hygiene and ecology. Propaedeutics of therapeutic dentistry. Propaedeutics of orthopedic dentistry. Propaedeutics of pediatric therapeutic dentistry. Pathomorphology. Pathophysiology. Pharmacology.

Post requisites:

Module 4. Clinical pharmacology lays the foundations for further study by students of such disciplines as: Prevention of dental diseases. Therapeutic dentistry. Surgical dentistry. Orthopedic dentistry. Orthodontics. Pediatric therapeutic dentistry. Pediatric surgical dentistry. Emergency and urgent medical care. General medical training (ophthalmology, neurology, including neurostomatology, dermatology, venereology, psychiatry, narcology, medical psychology, physical rehabilitation, sports medicine, endocrinology). Otorhinolaryngology. Training of officers in the field of knowledge "Health". Specialty "Dentistry".

Purpose and objectives of Module 4. Clinical Pharmacology

1.1. **The purpose of the study** is to prepare specialists with a sufficient amount of theoretical knowledge and practical skills for conducting the most rational drug therapy for a particular patient, owning the methodology for choosing the most effective and safe drugs, as well as their combinations, taking into account the individual characteristics of the body, the course and form of the disease, the presence of concomitant pathology, based on evidence-based medicine

1.2. The main objectives of the study are:

a) training a specialist with a sufficient amount of theoretical knowledge and practical skills to conduct the most rational drug therapy in a particular patient;

b) mastery of the methodology of individual selection of effective and safe drugs based on pharmacokinetics, pharmacodynamics and possible manifestations of side effects, features of the course of the disease, age of the patient;

c) analysis of the use of drugs in the provision of emergency care in dentistry.

1.3. Competencies and learning outcomes, the formation of which is facilitated by discipline (integral, general, special, competency matrix)

- integral:

The ability to solve complex problems and problems in the field of health care in the specialty “Stomatology” in a professional activity or in the learning process, provides for research and / or innovation and is characterized by uncertain conditions and requirements.

- general:

1. The ability to abstract thinking, analysis and synthesis; ability to learn and be modernly trained.
2. Knowledge and understanding of the subject area and understanding of the profession.
3. The ability to apply knowledge in practical situations.
4. The ability to communicate in the state language both verbally and in writing. Ability to communicate in another language.
5. Skills in the use of information and communication technologies.
6. The ability to search, process and analyze information from various sources.
7. The ability to adapt and act in a new situation; ability to work autonomously.
8. The ability to manifest, pose and solve problems.
9. The ability to choose a communication strategy.
10. The ability to work in a team.

11. Skills of interpersonal interaction.
12. The ability to act on the basis of ethical considerations (motives).
13. Skills for implementing safe activities.
14. The ability to evaluate and ensure the quality of work performed.
15. The desire to preserve the environment.
16. The ability to act socially responsible and civil-conscious.

- special:

1. Collection of medical information about the patient's condition.
2. Assessment of the results of laboratory and instrumental studies.
3. Diagnosis of emergency conditions.
4. Performing medical manipulations.
5. Determination of tactics and emergency medical care.
6. Definition of tactics of conducting the patient with somatic pathology.
7. Assessment of the environmental impact on the health status of the population (individual, family, population).
8. Maintaining medical records.
9. Development of state, social and medical information.

Program learning outcomes, the formation of which is facilitated by the discipline of Internal Medicine (including clinical pharmacology, clinical immunology and allergology, occupational diseases), including Module 4. Clinical Pharmacology:

1. To know and understand basic and clinical biomedical sciences at a level sufficient to solve problems in the field of health care in the specialty ‘Dentistry’ in professional activity or in the process of study.
2. Identify and identify leading clinical symptoms and syndromes; according to standard methods, using preliminary data of the patient's anamnesis, data of the patient's examination, knowledge about the person, his organs and systems, to establish a probable nosological or syndromic preliminary clinical diagnosis of a dental disease.
3. Collect information about the general condition of the patient, assess the psychomotor and physical development of the patient, the condition of the maxillofacial organs, based on the results of laboratory and instrumental studies to assess information about the diagnosis.
4. Assign and analyze additional (mandatory and optional) examination methods (laboratory, radiological, functional and / or instrumental) according to list 5, patients with diseases of organs and tissues of the oral cavity and maxillofacial region for differential diagnosis of diseases.
5. Determine the final clinical diagnosis in accordance with the relevant ethical and legal norms, by making an informed decision and logical analysis of the obtained subjective and objective data of clinical, additional examination, differential diagnosis under the supervision of a doctor in a health care facility.
6. Diagnose emergencies under any circumstances (at home, on the street, in a medical institution), in conditions of emergency, martial law, lack of information and limited time.
7. Determine the approach, plan, type and principle of treatment of dental disease by making an informed decision according to existing algorithms and standard schemes.
8. Determine the tactics of managing a dental patient with somatic pathology by making an informed decision according to existing algorithms and standard schemes.
9. Carry out treatment of the main dental diseases according to the existing algorithms and standard schemes under the control of the doctor-manager in the conditions of the health care institution.
10. Organize carrying out of medical and evacuation actions among the population, military men, in the conditions of an emergency situation, including martial law, during the detailed stages of medical evacuation, taking into account the existing system of medical and evacuation support.
11. Determine the tactics of emergency medical care, using the recommended algorithms, under any circumstances on the basis of a diagnosis of emergency in a limited time.
12. Analyze and evaluate government, social and medical information using standard approaches

and computer information technology.

13. Form goals and determine the structure of personal activities based on the results of the analysis of certain social and personal needs.
14. To be aware of and guided in their activities by civil rights, freedoms and responsibilities, to raise the general cultural level.
15. Adhere to the requirements of ethics, bioethics and deontology in their professional activities.
16. Organize the necessary level of individual safety (own and persons cared for) in case of typical dangerous situations in the individual field of activity.
17. Perform medical manipulations on the basis of preliminary and / or final clinical diagnosis for different segments of the population and in different conditions.
18. Perform medical dental manipulations on the basis of preliminary and / or final clinical diagnosis for different segments of the population and in different conditions.
19. Manipulate emergency medical care, using standard schemes, under any circumstances on the basis of a diagnosis of emergency in a limited time.

Learning Outcomes for Module 4. Clinical Pharmacology. As a result of studying the discipline the student must:

know:

- modern classifications of drugs;
- pharmacological characteristics of drugs;
- indications for the drugs usage in accordance with knowledge of their pharmacodynamics;
- side effects when using drugs and contraindications to use;
- features of the drugs usage in dentistry;
- features of main groups drugs interaction with local anesthetics.

be able to:

- conduct a survey of patients in order to collect medical history and anticipate the possibility of complications of pharmacotherapy;
- choose the necessary drugs, adequate dosage form and mode of administration when prescribed to patients with major pathological syndromes;
- determine the main methods of clinical research of patients to assess the effectiveness and safety of drugs and analyze their results;
- foresee the effects of drug interactions in combined use and have the skills to prevent and correct undesirable effects of drugs;
- explain the dependence of the action of drugs on the pharmacokinetics of patients of different ages, comorbidities and concomitant therapy;
- assess the benefit / risk ratio of drugs usage.

Thematic lecture plan (by modules) indicating the main issues addressed at the lecture (According to the working curriculum - not provided).

Thematic plan of seminars on modules and content modules indicating the main issues addressed at the seminar

(According to the working curriculum - not provided).

Thematic plan of practical classes on modules and content modules with an indication of the main issues addressed in the practical lesson

№	Name topics	Number hours
Module 4. Clinical Pharmacology		
1.	**Topic 1. Object and the task to clinical pharmacology. The basic condition of pharmacokinetics and pharmacodynamics. Interaction of medicines, the forms of the side-action of medicines, complication of the drug therapy.** Definition of the subject "Clinical Pharmacology". Methods for monitoring the effectiveness and safety of the use of various drugs.	2

	Routes of administration, distribution, biotransformation, excretion of drugs. The mechanism of action of drugs, their pharmacological effects and changes in the state of body functions in response to the effects of drugs. The interaction of drugs with complex drug therapy, the types and nature of the manifestation of the interaction. Clinical manifestations of drug interactions. Combined medicines. Advantages and disadvantages of combination drugs. Types of side effects of drugs. Complications of drug therapy. Classification of side effects of drugs. The main types of adverse reactions associated with pharmacological activity. General concept of medical illness. The causes, the main clinical options and manifestations of drug disease. Syndromes that occur in response to the use of drugs as a manifestation of a drug disease (Lyell syndrome, Stevens-Johnson syndrome).	
2.	**Topic 2. The clinico-pharmacological characteristic of antianginal and antihypertensive drugs. Clinical and pharmacological characteristics of drugs that affect hemostasis.** The principles of treatment of arterial hypertension. Classification of antihypertensive drugs. The rationale for the choice of the drug depending on the stage and degree of hypertension. Characterization of drugs of the first and second line. Dosage regimen. Comparative characteristics of drugs in terms of effectiveness and the principle of choice, drug compatibility for various flow patterns and the presence of concomitant pathology. Evaluation of the effectiveness and safety of use. The choice of drug and dosage regimen depending on age, the presence of pregnancy. Antihypertensives for emergency care. Types and basic principles of treatment of antihypertensive conditions. Classification and mechanisms of action of drugs that increase blood pressure during shock conditions of various origins, collapse, arterial hypotension, allergic reactions. Evaluation of the effectiveness and safety of use. The choice of drug and dosage regimen depending on age, the presence of pregnancy. Classification of antianginal and anti-ischemic drugs. Features of the combined use of drugs (organic nitrates, ß-blockers and calcium channel blockers). If-channel blockers, antianginal drugs belonging to other pharmacological groups. Dosage regimen. Indications and contraindications. Factors that reduce resistance to drugs in this group. Methods for evaluating the effectiveness and safety of therapy. Tolerance and withdrawal syndromes.	2
3.	**Topic 3. The clinico-pharmacological characteristic of anti-inflammatory drugs (non-steroidal and steroidal anti-inflammatory drugs).** Classification of non-steroidal and steroidal anti-inflammatory drugs. Modern ideas about the mechanism of action. Comparative characteristics of the anti-inflammatory effects of drugs. Indications and contraindications for use. Dosage regimen. Schemes for the administration of glucocorticoids. Compatibility of drugs in combination therapy of diseases. Side effects, methods for monitoring the effectiveness and safety of treatment. The principles of choice and purpose.	2
4.	**Topic 4. The clinico-pharmacological characteristic of antiseptics, synthetic antibacterial agents (fluoroquinolones, sulfonamides, nitroimidazole derivatives, etc.).** Classification of antiseptics. The mechanisms of action and the spectrum of antibacterial activity. The rationale for the choice of antiseptics depending on the pathology. Side effects and methods for their prevention. Classification of synthetic antibacterial agents. The choice of antibacterial agents in accordance with the sensitivity of microorganisms and the localization of processes, the severity of the disease. Side effects and contraindications for antibiotic therapy.	2
5.	**Topic 5. The clinico-pharmacological characteristic of antibiotics.** The principles of modern antibiotic therapy. Classification of antibiotics. The role of antibiotics and chemotherapeutic drugs in infectious and purulent-inflammatory diseases. The choice of antibacterial agents in accordance with the sensitivity of	2

	microorganisms and the localization of processes, the severity of the disease. Clinical and pharmacological characteristics of β-lactam antibiotics and macroliths. Indications for use and their side effects.	
6.	**Topic 6. The clinico-pharmacological characteristic of antibiotics (continued).** Clinical and pharmacological characteristics of lincosamides, tetracyclines, glycopeptides, levomecithin, etc. The choice of antibacterial drugs depending on pharmacokinetics, activity spectrum and toxicity. Age features of antibiotic therapy. Features of use in dental practice. Antibiotic resistance and ways to overcome it	2
7.	**Topic 7. The clinico-pharmacological characteristic of antifungal and antiviral drugs.** Classification of antifungal agents. Mechanism of action. Principles of use in dental practice (local mycoses). Side effects. Evaluation of the effectiveness and safety of the use of antifungal drugs. Classification of antiviral agents. Mechanism of action. Application in dental practice. Adverse Reactions Evaluation of the effectiveness and safety of the use of antiviral (herpes virus infection) drugs.	2
8.	**Topic 8. The clinico-pharmacological characteristic of local anesthetics, non-narcotic and narcotic analgesics. Clinical pharmacology of drugs that are used in emergency conditions.** Modern approaches to local anesthesia. Classification of local anesthetics by duration of action and chemical structure. The rationale for the individual choice of the drug depending on the mechanism of action and pharmacokinetic properties of the local anesthetic, indications and contraindications for its use. Dosage of drugs. The choice of drug, dosage taking into account age and comorbid conditions. Evaluation of the effectiveness and safety of use. Possible adverse reactions with local anesthetics. Principles of choice and use of analgesics. Clinical and pharmacological characteristics of drugs used in emergency conditions (anaphylactic shock, bronchial asthma, bleeding, myocardial infarction).	2
9.	**Topic 9. Definition of "the protocol of effectiveness and safety of the use of medicines".** Including independent (individual) work-supervision of the patient with the writing of the "Protocol for the efficacy and safety of drugs." Each student receives a "Protocol ....." form. which fills when working with the patient in extracurricular time. Diagnosed. A treatment plan is prescribed. The characteristic of medications intended (substantiation of prescription, safety assessment of drugs taken by the interaction of drugs intended for the patient, recommendations for outpatient treatment) is given. Justification (in oral form) of the choice of rational pharmacotherapy for the treatment of a particular patient: methods and dosage regimens of drugs taking into account pharmacokinetic parameters, selected drug combinations, principles for preventing side effects and methods for monitoring the effectiveness of treatment.	2
10.	**Topic 10. Final modular control.**	2

Independent work

№	Content	Number of hours
1	Preparation for practical classes - theoretical preparation and development of practical skills	6
2	Writing a training protocol for the efficacy and safety of medicines	2
3	Preparing for the final module control	2
Total		10

Individual tasks

Individual tasks are one of the forms of organization of study in academy, which aims to deepen, generalize and consolidate the knowledge that students receive in the learning process, as well as putting this knowledge into practice. Individual tasks are performed by students independently under the guidance of a teacher. Individual tasks include: a lecture report on a practical lesson, case histories reports on practical classes, conducting sanitary-educational work, preparing a sanitary bulletin, a report at clinical conferences at the department's bases, writing abstracts, and articles. Tasks for independent work include processing topics in clinical pharmacology that are not included in the mandatory practical training plan. The topic of independent work should include various facets of the action of drugs or groups of drugs with a detailed study of the pharmacodynamics and pharmacokinetics of drugs; differences in the effect of various drugs within the same group; detailed side effects of drugs; synergism of drugs of various groups to achieve specific therapeutic effects and so on. Creation and presentation of multimedia presentations on topics of independent work.

The list of theoretical questions for preparing students for final module control

1. Clinical pharmacodynamics, definitions, place and role in the choice of pharmacotherapy.
2. Clinical pharmacokinetics, definitions, basic concepts, role in the choice of pharmacotherapy.
3. Groups of drugs related to antianginal and anti-ischemic drugs.
4. The mechanism of action, pharmacological effects, indications and contraindications for the appointment of nitrates.
5. The mechanism of action, pharmacological effects, indications and contraindications for the appointment of beta-blockers.
6. Classification of calcium channel blockers. Features of the application. Dosage
7. Classification of beta-blockers. Features of the application. Dosage
8. Antiplatelet drugs. Classification. Mechanisms of action. Dosage Methods.
9. Thrombolytic agents. Indications and contraindications for thrombolysis. Schemes of appointment.
10. Anticoagulants. Classification. Mechanisms of action. Side effects
11. The principles of the choice of drugs for the treatment of an attack of angina pectoris, acute myocardial infarction.
12. Classification of antihypertensive drugs.
13. A differentiated approach to the appointment of antihypertensive therapy in the presence of concomitant diseases (diabetes mellitus, bronchial asthma, pregnancy, advanced age, pheochromocytoma, etc.).
14. The mechanism of antihypertensive action, side effects with the appointment of calcium channel blockers. Principles of dosing.
15. The mechanism of antihypertensive action, side effects with the appointment of beta-blockers. Principles of dosing.
16. The mechanism of antihypertensive action, pharmacological effects, indications and contraindications, side effects with the appointment of ACE inhibitors. Principles of dosing.
17. The mechanism of antihypertensive action, pharmacological effects, indications and contraindications, side effects when prescribing angiotensin II receptor antagonists. Principles of dosing.
18. The principles of the combined use of antihypertensive drugs.
19. Differentiated choice of drugs for the treatment of hypertensive crises.
20. Classification of cardiac glycosides. Principles of dosing. Cardiac and non-cardiac effects of cardiac glycosides. Indications for appointment.
21. Classification of diuretics drugs.
22. A differentiated approach to choosing a diuretic drug, depending on the presence of concomitant diseases (effect on lipid and carbohydrate metabolism).
23. Classification of drugs affecting bronchial patency.
24. The mechanism of action, pharmacokinetics, indications and contraindications for the appointment of short-acting beta-2 agonists. Principles of dosing.
25. Glucocorticosteroids. Pharmacokinetics and pharmacodynamics. Benefits of using inhaled

glucocorticoids. Dosage regimens.

26. Side effects that occur with prolonged use of glucocorticosteroids.
27. Drug Interactions. Views. Clinical examples.
28. Types of side effects when using drugs.
29. Clinical and pharmacological classification of non-steroidal anti-inflammatory drugs.
30. The mechanism of action, pharmacological effects of non-steroidal anti-inflammatory drugs.
31. Indications and contraindications. Side effects when using non-steroidal anti-inflammatory drugs, their prevention and treatment.
32. Modern principles for the selection of antimicrobial drugs.
33. Side effects of antibiotic therapy, their prevention and treatment.
34. Classification of the spectrum of activity, mechanism of action, features of the clinical use of penicillin. Principles of dosing.
35. Classification, activity spectrum, mechanism of action, clinical features of cephalosporins. Principles of dosing.
36. The spectrum of activity, mechanism of action, clinical features of the use of carbapenems. Principles of dosing.
37. Classification, activity spectrum, mechanism of action, clinical features of aminoglycosides. Principles of dosing.
38. Classification of the spectrum of activity, mechanism of action, clinical features of macrolides. Principles of dosing.
39. Classification of the spectrum of activity, mechanism of action, clinical features of fluoroquinolones. Principles of dosing.
40. The spectrum of activity, mechanism of action, clinical features of the use of glycopeptides. Principles of dosing.
41. The spectrum of activity, mechanism of action, clinical features of the use of nitroimidazoles and nitrofurans. Principles of dosing.

The list of practical skills for the final module control

1. Solve a set of tasks related to the relationship between the dentist and the patient, which will contribute to the choice of rational pharmacotherapy.
2. To be able to correctly determine the group of drugs and a particular drug.
3. Explain the pharmacokinetics of drugs.
4. Explain the pharmacodynamic effects of drugs.
5. Assess the potential for beneficial or unwanted drug interactions.
6. Predict side effects associated with the spectrum of pharmacological effects of drugs.
7. Justify the use of appropriate pharmacotherapeutic measures in the development of adverse reactions to drugs.
8. To be able to fill out a message card (form 137 / y) about the side effects of drugs.
9. Explain the pharmacokinetics and pharmacodynamics of drugs, depending on the functional state of the patient's body (age, pregnancy, etc.).
10. Justify the need for combined prescription of drugs.
11. Be able to write prescriptions for drugs.

The list of medicines that a student should possess in Appendix 1.

The form of final control of learning success - <u>final modular control.</u>

Final control system

When assessing the mastery of each module topic, student is graded by a 4-point (traditional) scale using developed standardized generalized criteria for assessing students knowledge for the discipline. This takes into account all types of work provided by the guidelines for the study of topics.

Table 1. Standardized generalized criteria for grading the knowledge of higher education students in PSMU

A 4-point scale	Grades in ECTS	Grades criteria
5 (outstanding)	A	Student shows special creative abilities, is able to acquire knowledge independently, finds and processes necessary information, is able to use the acquired knowledge and skills for making decisions in unusual situations, makes convincing answers, independently reveals own talents and inclinations, possesses not less than 90% of knowledge on the topic both during the survey and all types of control.
4 (good)	B	Student is fluent in the studied amount of material, applies it in practice, freely solves exercises and problems in standardized situations, independently corrects errors, the number of which is insignificant, has at least 85% knowledge of the topic both during survey and all types of control.
	C	Student is able to compare, summarize and systematize information under the guidance of a researcher, independently applies it in practice, to control their own activities; corrects mistakes, chooses arguments to confirm opinions, has at least 75% knowledge of the topic both during survey and all types of control.
3 (pass)	D	Student reproduces a significant part of theoretical material, shows knowledge and understanding of basic provisions with the help of a researcher, can analyze educational material, correct mistakes, has at least 65% knowledge of the topic both during survey and all types of control.
	E	Student has the educational material at a level higher than initial, a significant part of it reproduces at the reproductive level, has at least 60% knowledge of the topic both during survey and all types of control.
2 (insufficient)	FX	Student knows material at the level of individual fragments that make up a small part of the material, has less than 60% knowledge of the topic both during survey and all types of control.
	F	Student knows material at the level of elementary recognition and reproduction of individual facts, elements, has less than 60% knowledge of the topic both during survey and all types of control.

Grades conversion by traditional 4-point scale into multi-point (maximum score - 120 points) - conversion of total grade for the module – is carried out only after the final lesson, which precedes a final certification. Conversion is performed according to the following algorithm (table 2):

- calculates the average student's grade by traditional 4-point scale, obtained during the final classes which belongs to this module (up to 0,01);
- to obtain a converted multi-point total grade for the module, the average grade obtained by traditional 4-point scale must be multiplied by a factor of 24. Exceptions are cases where the average score by traditional 4-point scale is 2. In this case, the student receives 0 points on a multi-point scale;
- average grade is calculated on the total number of classes in the module, and not on the actual number of students attended.

The minimum convertible sum of grades for the module is 72 points.

Table №2. Unified table of grades, FMC grades, examination, and the traditional 4-point grades accordance

Average grade (A)	Average grade on module (A* 24)	FMC grade (A*16)	Grades for module/exam (A*24 + A*16)	ECTS category	4-point scale
2	48	32	80	**F FX**	**2 insufficient**
2,1	50	34	84		
2,15	52	34	86		
2,2	53	35	88		
2,25	54	36	90		
2,3	55	37	92		
2,35	56	38	94		
2,4	58	38	96		
2,45	59	39	98		
2,5	60	40	100		
2,55	61	41	102		
2,6	62	42	104		
2,65	64	42	106		
2,7	65	43	108		
2,75	66	44	110		
2,8	67	45	112		
2,85	68	46	114		
2,9	70	46	116		
2,95	71	47	118		
3	72	50	122	**E**	**3 pass**
3,05	73	50	123		
3,1	74	50	124		
3,15	76	50	126		
3,2	77	51	128		
3,25	78	52	130	**D**	
3,3	79	53	132		
3,35	80	54	134		
3,4	82	54	136		
3,45	83	55	138		
3,5	84	56	140	**C**	**4 good**
3,55	85	57	142		
3,6	86	58	144		
3,65	88	58	146		
3,7	89	59	148		
3,75	90	60	150		
3,8	91	61	152		
3,85	92	62	154		
3,9	94	62	156		
3,95	95	63	158		
4	96	64	160	**B**	
4,05	97	65	162		

4,1	98	66	164		
4,15	100	66	166		
4,2	101	67	168		
4,25	102	68	170		
4,3	103	69	172		
4,35	104	70	174		
4,4	106	70	176		
4,45	107	71	178		
4,5	108	72	180	**A**	**5 outstanding**
4,55	109	73	182		
4,6	110	74	184		
4,65	112	74	186		
4,7	113	75	188		
4,75	114	76	190		
4,8	115	77	192		
4,85	116	78	194		
4,9	118	78	196		
4,95	119	79	198		
5	120	80	200		

Control of theoretical and practical training of the student during the semester final certification is carried out according to the following regulations:

1. Carrying out of **test control** (within 25 min - performance of 25 selective type test tasks with one correct answer) - **50 points**.

2. Solving two situational problems, followed by prescribing the selected drug (within 10 minutes) - **20 points**.

3. Protection of the "Efficacy and safety protocol of medicines" - **10 points**.

Students who during the study of module acquired an average grade from 4.50 to 5.0 are exempt from FMC and exam and automatically (by agreement) receive a final grade according to the table 2 considering mandatory presence of the student at FMC and exam. In case of disagreement with the assessment, the specified category of students are passing FMC and exam according to the general rules.

Student has the right to retake the FMC only 2 times and only during the examination session. The result of the student's FMC is recorded in the "Statement of student achievement in the discipline" and sealed with the signatures of the teacher and the head of the department.

Teaching methods

- verbal (explanations, story, conversation, briefing);
- visual (observation, illustration, demonstration);
- practical (thematic discussions, brainstorming, round table, analysis of specific situations (case method), business games, presentations).

Control methods

- oral control;
- written control;
- test control;
- programmable control;
- practical verification;
- self-control;
- self-esteem.

Types of control:

- preliminary (output)
- current;
- final modular control

Methodological support

1. Working curriculum
2. Syllabus
3. Methodical development of lectures
4. Methodical recommendations for teachers
5. Methodical instructions for independent work of students during preparation for a practical lesson and in class
6. Methodical recommendations on the organization of industrial practice
7. List of recommended reading
8. Materials for control of knowledge, skills and abilities of students:

- tests of different levels of difficulty
- tests from the bank of licensing exams "Step 2"
- situational tasks
- computer control programs

9. Videos.
10. Multimedia presentations.
11. Clinical tests.

Literature

Basic (available at the library of PSMU):

1. Pharmacoterapy in dentistry: manual / V.M. Bobyriov, T.A. Petrova, G.Yu. Ostrovska, A.A. Kapustianska. – Vinnytsia: Nova Knyga, 2020. – 376 p.: il.

2. Clinical pharmacology : Manual for practical classes : [навч. посіб. для студентів-іноземців вищ. мед. закладів] / O. B. Крайдашенко, Б. Б. Самура, І. Б. Самура et al. – 3rd ed., updat. – Vinnytsia : Nova Knyha, 2019. – 228 p.

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- Drogovoz S. M. Pharmacology-Cito: textbook / S. M. Drogovoz. – Kharkiv, 2010. – 192 p. – Режим доступу : http://dspace.nuph.edu.ua/bitstream/123456789/17681/1/Pharmacology-Cito.pdf

– Asthma and Allergy Foundation of America (AAFA) – Режим доступу: https://www.aafa.org/

– Basic & Clinical Pharmacology / Edited by Bertram G. Katzung. - San Francisco : McGraw-Hill Professional, 2012. – 1248 p. – Режим доступу: https://www.amazon.com/Basic-Clinical-Pharmacology-Bertram-Katzung/dp/0071825053

– CHEST: journal site. CME Resource Center. – Режим доступу: http://www.chestjournal.org/

– Latest medical news. Журнальні статті, CME. – Режим доступу: http://www.medscape.com/

– The Pulmonary Hypertension Association (PHA). – Режим доступу: http://www.phassociation.org/

Developers:
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Candidate of Medical Sciences, Associate Professor Galina Ostrovska
Candidate of Medical Sciences, Associate Professor Antonina SYDORENKO

Calcium channel blockers	
Amlodipine	Tab. 5 and 10 mg
Nifedipine	Tab. 10 mg
Verapamil	Tab. 40 and 80 mg; solution for in. (1 ml - 2.5 mg)
Diltiazem	Tab. 60 and 90 mg
Adrenergic receptor blockers (alpha and beta)	
Bisoprolol	Tab. 5 and 10 mg
Metoprolol	Tab. 50 and 100 mg
Nebivolol	Tab. 5 mg
Carvedilol	Tab. 12.5 and 25 mg
Labalalol	Tab. 100 and 200 mg; sol. for in. (1 ml - 10 mg)
Doxazosin	Tab. 2, 4 and 8 mg
ACE inhibitors	
Captopril	Tab. 25 and 50 mg
Enalapril	Tab. 5, 10 mg; solution for in. (1 ml - 1.25 mg)
Lisinopril	Tab. 10 and 20 mg
Perindopril	Tab. 4 mg
Ramipril	Caps. 2.5 and 5 mg
Angiotensin-II receptor antagonists	
Valsartan	Caps. 80 and 160 mg
Candesartan	Tab. 4, 8 and 16 mg
Losartan	Tab. 50 mg
Telmisartan	Tab. 40 and 80 mg
Combined antihypertensive drugs	
Enalapril / hydrochlorothiazide	Tab. 10/25 mg
Lisinopril / Hydrochlorothiazide	Tab. 10 / 12.5 mg
Lisinopril / Amlodipine	Tab. 10/5 mg
Central sympatholytics	
Alpha-methyldopa	Tab. 250 mg
Clonidine	Tab. 75 and 100 mcg; solution for in. (1 ml - 150 mcg)
Nitrates and Sydnimines	
Isosorbide 5-mononitrate	Tab. 10, 20 and 40 mg
Isosorbide dinitrate	Tab. 20 and 40 mg; sol. for in. (1 ml - 1 mg)
Nitroglycerin	Tab. 500 mcg; solution for in. (1 ml - 5 mg)
Molsidomine	Tab. 2 and 4 mg
F-channel blockers	
Ivabradine	Tab. 5 and 7.5 mg
Antiarrhythmic drugs	
Amiodarone	Tab. 200 mg; solution for in. (1 amp. - 150 mg)
Aethacizinum	Tab. 50 mg
Lidocaine	Sol. for in. (1 ml - 10, 20, 40 or 100 mg)
Propafenone	Tab. 150 and 300 mg; solution for in. (1 ml - 3.5 mg)
Procainamide	Tab. 250 mcg; solution for in. (1 ml - 10 mg)
Totalol	Tab. 80 and 160 mg; solution for in. (1 ml - 10 mg)
Cardiac glycosides and non-glycoside cardiotonic drugs	
Digoxin	Tab. 100 and 250 mcg; solution for in. (1 ml - 125 mcg)
Corgliconum	Sol. for in. (1 ml - 600 mcg)
Dobutamine	Dry substance for in. (1 amp. - 250 mg)

Dopamine	Sol. for in. (1 ml - 5 mg)
Hypolipidemic drugs	
Atorvastatin	Tab. 10 and 20 mg
Rosuvastatin	Tab. 10 and 20 mg
Simvastatin	Tab. 10 and 20 mg
Fenofibrate	Caps. 200 mg
Diuretic drugs	
Hydrochlorothiazide	Tab. 25, 50 and 100 mg
Indapamidunt	Tab. 1.5 and 2.5 mg
Spironolactone	Tab. 25, 50 and 100 mg
Torasemide	Tab. 10, 20, 50 and 100 mg; solution for in. (1 ml - 10 mg)
Furosemide	Tab. 40 mg; sol. for in. (1 ml - 10 mg)
Moduretic	Tab. 5/50 mg
Mannitol	Sol. for i.v. inj. (1 ml-150 mg)
Antiallergic drugs	
Ketotifen	Tab. 1 mg
Cromolin sodium	Caps. 100 mg
Diphenhydramine	Tab. 20 and 50 mg; solution for in. (1 ml - 10 mg)
Clemastine	Tab. 1 mg; solution for in. (1 ml - 1 mg)
Loratadine	Tab. 10 mg
Fexofenadine	Tab. 120 and 180 mg
Chloropyramine	Tab. 25 mg; solution for in. (1 amp. - 20 mg)
Cetirizine	Tab. 10 mg
Drugs that affect bronchial	
Epinephrine	Sol. for in. (1 ml-1 mg)
Ambroxol	Tab. 30 mg; solution for in. (1 ml-7.5 mg)
Acetylcysteine	Tab. 100 mg; solution for in. (1 ml - 100 mg)
Euphyllin	Tab. 150 mg; solution for iv in (1 ml - 24 mg)
Salbutamol	Tab. 2, 4 and 8 mg); Dose aerosol for inhalation (1 dose - 100 mcg)
Salmeterol	Dose aerosol for inhalation (1 dose-25 mcg)
Fenoterol	Tab. 5 mg; Dose aerosol for inhalation (1 dose - 100 mcg)
Tiotropium bromide	1 powder for in. (1 capsule-18 mcg)
Beclometasone	Dose aerosol for in. (1 dose - 50, 100 mcg)
Fluticasone	Dose aerosol for inhalation (1 dose - 25, 50, 125 mcg)
Montelucast	Tab. 5 and 10 mg
Anti-inflammatory drugs	
Hydrocortisone	Suspension for in. (1 vial - 125 mg)
Dexamethasone	Tab. 4 mg; solution for in. (1 ml - 4 mg)
Prednisolone	Tab. 5 mg; solution for in. (1 ml - 30 mg)
Diclofenac sodium	Tab. 50 and 100 mg; solution for in. (1 ml-25 mg)
Meloxicam	Tab. 7.5 and 15 mg
Nimesulide	Tab. 100 mg
Acetaminophen	Tab. 325 and 500 mg
Celecoxib	Caps. 100 and 200 mg
Methylprednisolone	Tab. 4, 16 and 32 mg
Chloroquine	Tab. 250 mg
Antibacterial drugs	
Azithromycin	Tab. 500 mg
Amicacin	Sol. for in. (1 ml - 50, 125 and 250 mg)
Amoxicillin	Tab. 500 mg each; Dry substance for oil in. (1 vial - 500 mg)

Amoxicillin / Clavulanic acid	Tab. 500/125 mg; Dry substance for in. (1 vial - 1000/200 mg)
Benzylpenicillin	Dry substance for in. (1 fl. - 1,000,000 OD)
Vancomycin	Dry substance for in. (1 vial - 500 mg)
Gentamicin	Sol. for in. (1 ml - 40 mg)
Doxycycline	Tab. 100 and 200 mg; Dry substance for in. (1 vial - 10 mg)
Ertapenem	Dry substance for in .. (1 vial-1000 mg)
Imipenem	Dry substance for in. (1 vial-500 mg)
Clarithromycin	Tab. 250 mg; Dry substance for in. (1 vial -500 mg)
Clindamycin	Caps. 150 and 300 mg; solution for in. (1 ml - 150 mg)
Levofloxacin	Tab. 250 and 500 mg
Linezolid	Tab. 400 and 600 mg
Moxifloxacin	Tab. 400 mg
Rifampicin	Tab. 150 and 30 mg
Streptomycin	Powder for in. (1 vial. 1000 mg)
Co-trimoxazolum	Tab. 480 mg
Sulfasalazin	Tab. 500 mg
Tetracycline	Caps. 250 mg
Fluconazole	Caps. 50 and 100 mg
Cefepim	Dry substance for in. (1 vial - 500 and 1000 mg)
Cefotaxime	Dry substance for in. (1 vial - 500 and 1000 mg)
Ceftriaxone	Dry substance for in. (1 vial - 250 and 500 mg)
Cefuroxim	Tab. 250 and 500 mg; Dry substance for in. (1 vial - 750 and 1500 mg)
Ceftazidime	Dry substance for in. (1 vial - 500 and 1000 mg)
Ciprofloxacin	Tab. 500 mg; solution for in. (1 ml -2 mg)
Antiviral drugs	
Aciclovir	Tab. 200, 400 and 800 mg; Dry substance for in. (1 amp. - 250 mg)
Interferon alpha	Sol. for in. (1 ml - 1,000,000, 3,000,000, 6,000,000 MO)
Remantadin	Tab. 50 mg
Ribavirin	Dry substance for inhal. (1 fl. -6 g)
Drugs that affect the functions of the digestive tract	
Atropine sulphate	Sol. for in. (1 ml -1 mg)
Bismuth subcitrate	Tab. 120 mg
Domperidone	Tab. 10 mg
Drotaverine hydrochloride	Tab. 40 mg; solution for in. (1 ml - 20 mg)
Lactulose	Syrup (15 ml - 10 g)
Loperamide	Tab. 2 mg
Metoclopramide	Tab. 5 and 10 mg; solution for in. (1 ml - 5 mg)
Omeprazole	Caps. 20 mg; Dry substance for Ing. (1 vial - 40 mg)
Pantoprazole	Caps. 40 mg
Rabeprazole	Tab. 10 and 20 mg
Pirenzepine	Tab. 25 and 50 mg; solution for in. (1 ml - 5 mg)
Sucralfate	Tab. 1000 mg
Famotidine	Tab. 20 and 40 mg ; dry substance for Ing. (1 vial - 20 mg)
Almagel	Suspension for oral administration (1 ml-100 mg)
Drugs that affect the functions of the digestive system	
Ademetionine	Tab. 400 mg ; dry substance for in. (1 vial - 400 mg)
Essential phospholipids	Caps. 300 mg; 5 ml amp.
Octreotide	Sol. for in. (1 ml - 50 and 100 mcg)
Pancreatin	Caps. 150 and 300 mg

Silymarin	35 mg tablets caps. 70 mg
Ursodeoxycholic acid	Caps. 250 mg
Holagogum	Caps. 40 mg
Drugs affecting the coagulation system	
Alteplase	Dry substance for in. (1 vial - 20 and 50 mg)
Aminocaproic acid	Sol. for in. (1 ml - 50 mg)
Acetytsalicylic acid	Tab. 100 mg
Warfarin	Tab. 2.5 and 3 mg
Vicasolum	Tab. 15 mg; solution for in. (1 ml - 10 mg)
Heparin	Sol. for in. (1 ml - 5000 IU)
Etamsylate	Tab. 250 mg; solution for in. (1 ml - 125 mg)
Enoxaparin sodium	Sol. for in. (1 ml - 100 mg)
Riva roxa ban	Tab. 10 mg
Streptokinase	Dry substance for Ing. (1 fl - 100,000 IU and 250,000 IU)
Clopidogrel	Tab. 75 mg

Study protocol for the efficacy and safety of drug use
(According to the supervision of patients)

Educational research work

Student _____
(full name., Course, group, faculty)
supervisor _____

PROTOCOL
studies of the pharmacodynamics of the drug _____
Patient (name, age, body mass) _____
Clinical diagnosis: underlying disease _____
Complications of the underlying disease _____
Concomitant diseases _____
Study Date: from _____ to _____

1. Patient treatment (provide in the form of prescriptions the 5 most significant drugs, including those selected for a thorough analysis)

2. Justification of the prescription of drugs (international, commercial names, chemical structure, features of the introduction, pharmacokinetics, pharmacodynamics of drugs)
   _____
   _____
   _____

3. Expected therapeutic effect _____
   _____
   _____
   _____

4. Possible side effects _____
   _____
   _____
   _____

5. List the signs by which the therapeutic efficacy of drugs will be monitored

Before treatment	After treatment
Subjective	
A)_____	_____
B) _____	_____
C)_____	_____
D) _____	_____
E) _____	_____
Physical	
A)_____	_____
B) _____	_____
C)_____	_____
D) _____	_____
Laboratory and Instrumental	
A)_____	_____
B) _____	_____

C)_____ _____
D) _____ _____

6. List the symptoms with which the side effects of drugs will be controlled.

Side effects	The presence of a reaction in the patient (yes, no)
Subjective	
A)_____	_____
B) _____	_____
C)_____	_____
D) _____	_____
E) _____	_____
Physical	
A)_____	_____
B) _____	_____
C)_____	_____
D) _____	_____
Laboratory and Instrumental	
A)_____	_____
B) _____	_____
C)_____	_____
D) _____	_____

7. Evaluation of combination therapy (to consider the possibility of co-administration of the drug was evaluated with other drugs from section No. 1: pharmacokinetic, pharmacodynamic, pharmaceutical compatibility) _____
_____

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

The study conducted _____ Protocol verified _____

Literature: