



MEDICAL UNIVERSITY PLOVDIV
FACULTY OF PHARMACY

ACADEMIC STANDART

FOR ACADEMIC DISCIPLINE

“PHARMACOKINETICS”

SPECIALITY MASTER OF PHARMACY



Approved by decision of the Department Council - Protocol No. 13 /
31.05.2017

1. Objective of the course

Pharmacokinetics curriculum for master pharmacists is consistent with the qualification characteristic of their activity and the educational degree they acquire. Pharmacokinetics is mandatory in the training of master pharmacists. In the course of pharmacokinetics, students are introduced to basic pharmacokinetic issues. Basic principles, models, pharmacokinetic parameters and their importance for drug therapy are discussed. The main objective of the course is to acquire knowledge and skills about the pharmacokinetic characteristics of medicines from different drug groups:

- drug resorption
- drug distribution
- drug excretion
- phenomenon of repeated and combined administration of medicines
- pharmacokinetic factors affecting the drug action
- side effects resulting from the pharmacokinetics of the drugs
- pharmacokinetic drug interactions

The goal is coordinated with:

- the public mission of the university - training that "contributes to the implementation of the state policy for the development of higher medical education and medical science, for the improvement of the health and health status of the population" and "training of highly qualified specialists with higher medical education";
- volume and credit rating of the discipline (ECTS system), as shown in the curriculum;
- the qualification characteristic of the specialty;
- degree (professional bachelor, bachelor or master).

The purpose is in line with the place of the discipline in the specialty according to importance and chronology in the curriculum.

Upon completion of the training, students should have the following knowledge and skills:

- know basic pharmacokinetics features
- rational choice of drugs by pharmacokinetic parameters for different therapeutic situations
- be able to search for and use up-to-date and express drug information related to pharmacokinetics of drugs.

2. Course content of the discipline

The lectures and the hours of lectures ,exercises, course assignments are listed on the website of the faculty: <http://mu-plovdiv.bg/wp-content/uploads/2016/09/uchebna-programa-farmatsiya.pdf>

The course content of the subject is chronologically arranged so that each subsequent lecture/exercise uses already studied subject matter and concepts. It is in line with the university's priority goals and enables the development of the student's personal qualities. Unnecessary overlap or the existence of "white spots" between "related" curriculum disciplines are avoided. Learning content provides the acquisition of key competences and skills that are of primary importance for the future professional realization of the student.

3. Prerequisites

The student should have basic knowledge of Biology, Biophysics, Physiology, Pharmaceutical chemistry, Biochemistry, Pharmacognosy, Microbiology, Anatomy, Patoanatomy, Phisiology and Pathophysiology from the educational programs in the first years of university studies in order to begin and successfully complete Pharmacokinetics training.

4. Academic resources

The academic staff of the department consists of 8 lecturers on an employment contract. Of these, 1 are habilitated lecturer, 7 non-habilitated lecturers with PhD degrees in the relevant specialty. Of all lecturers 3 have a specialty in pharmacology, 1 in clinical pharmacology and therapy, 2 in clinical pharmacy and 1 in pharmacology and pharmacotherapy.

The habilitated lecturer in Pharmacology has excellent theoretical and practical training, high professionalism, long-term experience in teaching and research work. Besides higher education - Master of Medicine, he also hold a Master's Degree in Health Management. Habilitated lecturer from the Department of Pharmacology and Drug Toxicology is member of the Expert Commissions, Editorial boards of Journals, State Commissions for Acquisition of Specialty, Scientific and Professional Organizations, Reviewers of Scientific Articles, Monographs, Collections and Textbooks in Bulgaria and Abroad. He participates in scientific juries for the acquisition of PhD degrees, academic titles "associate professor" and "professor". The department's lecturer actively participates in international exchanges under "Erasmus" and "Erasmus⁺" programs.

The teachers in the department holding the respective academic positions meet the national requirements set out in the Higher Education Act, DASRBA, the Regulations for the implementation of the DASRBA and the RSA of MU-Plovdiv.

Lectures in Bulgarian and English are read by a habilitated lecturer (professor) with acquired PhD in "Pharmacology (incl. pharmacokinetics and chemotherapy)". Up to 30% of the lectures are given to non-habilitated lecturers with a PhD degree in "Pharmacology (incl. pharmacokinetics and chemotherapy)".

5. Material resources

The department has at its disposal:

- 4 study rooms with a total area of approx. 103 sq.m.;
- 1 laboratories equipped with equipment for conducting experimental work. The total laboratory area of the department is about 30 m². The department's laboratory facilities include general and specific equipment, owned by the Department of Pharmacology and Clinical Pharmacology at the Medical University of Plovdiv, for the study of anti-inflammatory action, acute and chronic stress, pain, inflammation, training and memory.
- 4 cabinets - 16 square meters average area.
- 8 computers, allowing each teacher to work independently. The department has a continuous Internet connection and access to full-text publications through the library of MU - Plovdiv.

6. Lectures

The lectures are prepared and presented in the form of multimedia presentations. The volume and format of the lectures are chosen by the lead lecturer. The material discussed in the lecture course precedes the practical exercises on the subject. Presentations used for lecturing allow preliminary training of students for each practical.

7. Practical exercises

Practical exercises are not conducted

8. Seminars

Seminars are not conducted

9. Information resources. Basic literature. Websites.

Teachers have developed lectures in an electronic version. Practical exercises are conducted on the basis of a published handbook. The Library and Information Center of MU-Plovdiv provides a sufficient amount of specific specialized information to assist the students' training.

Basic literature

- ✓ Casebook in clinical pharmacokinetics and drug dosing. H. Cohen, Mc Graw Hill education, 2015 ISBN: 978-0-07-162835-8
- ✓ Applied Biopharmaceutics & Pharmacokinetics 7th edition. L. Shargel, McGraw Hill education, 2016 ISBN: 978-0071830935

The access to and use of information resources, as well as the service for the delivery of electronic articles for students, PhD students and employees from the Plovdiv University are free of charge.

10. Control work

Students are loaded dynamically and intensive during the semester. Teachers control students' progress twice during the semester - during lectures with written test and one theoretical question. Students are provided with advance information and explanations about the control work. The results are discussed at the next practical exercise with the students with explanations to assist in further preparation. The results of these tests are included as a component in the final grade for the semester.

11. Student's independent work and engagement

The student's independent work is supervised by the lecturer (assistant) who guides the student both in the literary sources and in the methods of their acquisition and study. Sample tests and self-study questions are included in the curriculum and are available *online* at the MU-Plovdiv website: <http://mu-plovdiv.bg/wp-content/uploads/2016/09/uchebna-programa-farmatsiya.pdf>

12. Collaboration between students and the teaching staff

This cooperation is expressed in:

- The teacher's commitment to the student and their preliminary preparation, current learning difficulties and opportunities with an individual learning program to achieve more.
- The use of reception counseling hours.

- Participation in a pharmacology study group.
- Involving students in teams for scientific tasks, research, projects, etc.

13. Exams

The on-going evaluations, provided in the pharmacology program, are given for solving of test and one theoretical question.

14. Evaluation standards

At the beginning of the classes in Pharmacokinetics, the assistant acquaints students with the standards of assessment, the procedures for conducting current control and the opportunities for obtaining feedback on their progress during the semester.

Standards for assessing student achievement are defined to objectify students' grades are unbiased. The evaluation criteria are as follows:

- **Poor mark (2)** – scant knowledge that can not serve as the basis for the next levels of pre-clinical and clinical training.
- **Average (3)** – reproduction of knowledge about pharmacokinetics of drugs in a "ready scheme" – resorption, distribution, metabolism and excretion; representing unresolved solutions to simple tasks; lack of knowledge for personal use of the obtained professional competencies; terminology is not well adopted, presentation is characterized by poor language.
- **Good (4)** – key and additional knowledge on pharmacokinetics of drugs- resorption, distribution, metabolism and excretion; there is limited independence and skills to solve simple tasks, although there is a good language culture, inaccuracies in the concepts used are allowed.
- **Very good (5)** – very well mastered pharmacokinetics parameters of drugs- resorption, distribution, metabolism and excretion. Independent, non-standard, search for a new algorithm and analysis of used literary data; skills to solve difficult tasks; tries to explain and substantiate their thesis; adequate use of the concepts of the subject of the discipline studied, good language culture.
- **Excellent (6)** – excellent knowledge of information sources of pharmacokinetics of drugs - resorption, distribution, metabolism and excretion; thoroughly mastered key and additional knowledge about pharmacokinetics of drugs; independent logic, thinking and correct understanding of therapeutic application of drugs; skills to apply the learned material to solve complex tasks; presence of creative elements; accuracy and rich language culture.

15. Formation of the final mark

The final grade determines to what extent the student has achieved the learning goal set at the beginning. Semester examination in pharmacokinetics includes two elements:

- Entry test with a duration of 15 minutes. The test is considered successfully passed with 70% correct answers.
- Written examination with a duration of one hour and thirty minutes.

The student gets a poor mark if:

- they quit the exam.
- they do not comply with the minimum requirements for the entry test.
- they not write on all questions included in the written examination, no matter how they developed the other questions.

Upon re-sit of the exam, the student attends all two parts of the examination.

The final score is obtained as a sum of the six-point scores of the different components multiplied by the relevant coefficients of significance, namely:

$$Q_{\text{final grade}} = K_1 Q_{\text{grade of the written exam}} + K_2 Q_{\text{grade of the on-going control}}$$

$$K_1 = 0.33; K_2 = 0.33$$

In case of a failed entry test, a poor assessment of the written or oral examination the final grade is necessarily a poor one.

The exam materials are stored and the students are given an opportunity to get acquainted with them and the grounds for their evaluation according to a procedure announced in advance. The period during which the students have access to the exam materials and results is not longer than 5 working days after the exam date.

Each discipline has a characteristic to which the student is given access at the beginning of the training.

The academic standard for an academic discipline is approved by Decision of the Academic Council - Protocol No. 9 / 26.11.2015 and published on the website of MU – Plovdiv.

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