

REQUIREMENTS

Semmelweis University, Faculty of Medicine Department of Pharmacology and Pharmacotherapy
Name of the subject: Pharmacology I. Credits: 4 Total number of hours: 63 lectures: 28 practices: 35 Type of the course (mandatory/elective): mandatory
Academic year: 2021/2022
Code of the course¹: AOKFRM678_1A
Course director (tutor): Dr. Ferdinandy, Péter Contact details: Department of Pharmacology and Pharmacotherapy, 1089 Budapest, Nagyvárad tér 4. Tel: +36-1-2104416, e-mail: ferdinandy.peter@med.semmelweis-univ.hu Position: Head of Department, full professor Date of habilitation and reference number: June 2 2001., 26/2001 Hab.
Aim of the subject and its place in the curriculum: Pharmacology is a synthesizing subject, building on what has been learned in the past, especially physiology, biochemistry, pathology, and translational medicine, and is essential for the later acquisition of clinical knowledge. The subject includes: general pharmacology, detailed pharmacology, toxicology and basics of prescription writing. General pharmacology (pharmacodynamics, pharmacokinetics) aims to acquire the basic concepts and knowledge needed for pharmacological thinking, while in detailed pharmacology the student learns the main principles of the mechanism of action, therapeutic effects, adverse effects, major interactions, and partly dosing of medicines. The basics of toxicology describe the mechanisms and targets of major intoxications and thus provide a theoretical background for toxicology education. All of these competencies form the grounds to study clinical pharmacology and prepare students for the skill-level application of pharmacotherapeutic knowledge essential to clinical subjects.
Location of the course (lecture hall, practice room, etc.): Nagyvárad téri Elméleti Tömb, 1089 Budapest, Nagyvárad tér 4.
Competencies gained upon the successful completion of the subject: Students understand the pharmacological terminology, learn the mechanism of action, therapeutic effects, adverse effects, important interactions of drugs and the basics of dosing. They understand the mechanisms and targets of the most important poisonings, as well as the knowledge of the basic rules of prescription writing.
Prerequisite(s) for admission to the subject: Medical Microbiology I, Medical Biochemistry II, Medical Physiology II OR Medical Physiology II, Medical Biochemistry III OR Medical Biochemistry, Molecular and Cell Biology III., Molecular Cell Biology II.

Minimum and maximum number of students registering for the course: Since it is a mandatory subject all the students in the fourth year of medical education must register.

Student selection method in case of oversubscription:

N/A

How to register for the course:

Through the NEPTUN system

Detailed thematic of the course²:

- 1st week
 - Lecture: Introduction to Pharmacology. (development, pharmacogenomics, basics of toxicology)
 - Practice: Pharmacodynamics I (drug receptors, receptor theories, drug-receptor interactions).
- 2nd week
 - Lecture: Basics of Pharmacokinetics (absorption, distribution, metabolism, excretion).
 - Practice: Pharmacodynamics II (quantal dose-response curves, therapeutic indices, tolerance, drug interactions).
- 3rd week
 - Lecture: Basics of the neurotransmission of the autonomic nervous system. Pharmacology of the cholinergic systems
 - Practice: Parasympathomimetics and parasympatholytics, centrally acting cholinergic drugs
- 4th week
 - Lecture: Pharmacology of the adrenergic system
 - Practice: Sympathomimetics and sympatholytics
- 5th week
 - Lecture: Pharmacology of the skeletal muscles.
 - Practice: Pharmacology of smooth muscles
- 6th week
 - Lecture: Anticoagulants, inhibitors of platelet aggregation
 - Practice: Fibrinolytics, drugs against bleeding, drugs acting on blood cell production. 1st midterm
- 7th week
 - Lecture: Drugs influencing cardiac electrophysiology
 - Practice: Positive inotropic agents.
- 8th week
 - Lecture: Diuretics, antidiuretics.
 - Practice: Drugs influencing blood pressure (sympatholytics, nitrates, Ca-channel blockers and other vasodilators. Pharmacology of RAAS.)
- 9th week
 - Lecture: Drugs acting on blood glucose control.
 - Practice: Drugs affecting lipid metabolism. Drugs influencing the oxygen demand and oxygen supply of the heart. Drugs improving microcirculation.
- 10th week
 - Lecture: Bronchodilators and drugs inhibiting the bronchial inflammatory processes.
 - Practice: Expectorants (secretomotorics, secretolytics, mucolytics), antitussive drugs. Autacoids, histamine, antihistamines. 2nd midterm
- 11th week
 - Lecture: Corticosteroids and their antagonists. Drugs inhibiting steroid hormone synthesis
 - Practice: Pharmacology of pituitary hormones. Hypothalamic hormones, hormonanalogs and antagonists. Pharmacology of thyroid gland (thyroid hormones and antithyroid drugs).
- 12th week
 - Lecture: Pharmacology of female sexual hormones.

- Practice: Androgens, antiandrogens, anabolic steroids, drugs influencing sexual activity.
- 13th week
 - Lecture: Basics of toxicology
 - Practice: Drugs affecting bone mineral homeostasis.
- 14th week
 - Lecture: Biological Drugs. Orphan Drugs. Advanced Therapy Medicines
 - Practice: Nutrients, traditional plant medicines, vitamins, anorectic drugs.

Potential overlap(s) with other subjects:

Physiology, biochemistry, molecular biology, pathology, translational medicine, internal medicine, cardiology, pulmonology, clinical pharmacology

Special training activities required³:

N/A

Policy regarding the attendance and making up absences:

Maximum number of absences is 25 percent of the number of practices in the semester. In the case of absence the student can attend another class the same week.

Means of assessing the students' progress during the semester⁴:

There are no mandatory midterm tests during the semester.

Requirement for acknowledging the semester (signature):

The number of absences must not be more than 25 percent of the number of practices in the semester.

Type of the examination:

oral semifinal exam

Exam requirements⁵:

One question is given from two topic lists each. Acceptable knowledge must be proven.

Topic list "A"

1. Pharmacodynamics I (Molecular targets of drugs. Drug receptors. Receptor theory.)
2. Pharmacodynamics II (relation between drug dose and clinical response, therapeutic index, tolerance, pharmacodynamic drug interactions).
3. Drug absorption, distribution and bioavailability. Membrane transport mechanisms.
4. Drug biotransformation and excretion, linear and non-linear kinetics. Enzyme inhibitors and enzyme inducers. Clearance, half-life, loading and maintenance dose. Pharmacokinetic drug interactions
5. Drugs acting on gastrointestinal and urogenital smooth muscles. Drugs influencing uterine function.
6. Histamine and antihistamines..
7. Glucocorticoids for oral and parenteral use
8. Mineralocorticoids. Topically applied glucocorticoids. Adrenocortical antagonists, inhibitors of corticosteroid synthesis.
9. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity
10. Estrogens and antiestrogens
11. Progestins and antiprogestins
12. Contraceptives
13. Thyroid and antithyroid drugs. Pituitary hormones. Hypothalamic hormones, hormonanalogs and antagonists.
14. Pancreatic hormones and parenterally applied antidiabetic drugs.
15. Oral antidiabetics.
16. Agents affecting bone mineral homeostasis (calcium, vitamin D, parathyroid hormone, calcitonin, etc.).
17. Drugs influencing blood coagulation I: Antiplatelet agents
18. Drugs influencing blood coagulation II: Anticoagulant drugs
19. Drugs influencing blood coagulation III: Fibrinolytic drugs. Drugs inhibiting bleeding
20. Agents used in anemias

Topic list "B"

1. Cholinergic transmission and its presynaptic modification.
2. Adrenergic transmission and its presynaptic modification
3. Cholinomimetics
4. Muscarinic receptor blocking drugs
5. Catecholamines
6. Indirect sympathomimetics. Selective α_1 and α_2 -agonists and drugs acting on the imidazoline receptors
7. α -receptor antagonists
8. β -receptor antagonists
9. Centrally acting skeletal muscle relaxants (spasmolytics). Dantrolene. Botulinum toxin
10. Skeletal muscle relaxants acting on the neuromuscular junction
11. Selective β_2 -stimulants and other bronchodilators.
12. Antiinflammatory agents inhibiting bronchial inflammatory processes. Antitussive agents and expectorants
13. Positiv inotropic drugs
14. Drugs influencing cardiac electrophysiology.
15. Drugs acting on the renin-angiotensin-aldosterone-system (RAAS)
16. Ca^{++} -channel blockers and other vasodilators
17. Drugs influencing the oxygen demand and oxygen supply of the heart.
18. Drugs improving microcirculation.
19. Drugs affecting lipid metabolism.
20. Potassium excreting (wasting) diuretics

21. Potassium sparing diuretics, ADH antagonists, osmotic diuretics
Type and method of grading⁶: One question is given from two topic lists each. According to the knowledge proven at the exam.
How to register for the exam: Registration must be done through the NEPTUN system for the days set by the department up to the limits.
Opportunities to retake the exam: According to the Study and Examination Policy of Semmelweis University
Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material): Basic and Clinical Pharmacology (Ed. B. G. Katzung), 14 th edition, McGraw-Hill Education, 2018. ISBN 978-1-260-28817-9 Materials discussed during lectures and seminars: http://semmelweis.hu/pharmacology , Moodle (https://itc.semmelweis.hu)
Signature of the tutor:
Signature(s) of the head(s) of the Institute(s):
Date:

Credit Transfer Committee's opinion:
Comment of the Dean's Office:
Signature of the Dean:

¹ Dékáni Hivatal tölti ki, jóváhagyást követően.

² Az elméleti és gyakorlati oktatást órákra (hetekre) lebontva, sorszámozva külön-külön kell megadni, az előadók és a gyakorlati oktatók nevének feltüntetésével. Mellékletben nem csatolható!

³ Pl. terepgyakorlat, kórlapelemzés, felmérés készítése stb.

⁴ Pl. házi feladat, beszámoló, zárthelyi stb. témaköre és időpontja, pótlásuk és javításuk lehetősége.

⁵ Elméleti vizsga esetén kérjük a tételsor megadását, gyakorlati vizsga esetén a vizsgáztatás témakörét és módját.

⁶ Az elméleti és gyakorlati vizsga beszámításának módja. Az évközi számonkérések eredményeink beszámítási módja.