REQUIREMENTS

Semmelweis University Faculty of Dentistry
Department of Pharmacology and Pharmacotherapy (Faculty of Medicine)

Name of the course: Pharmacology II

Credit value: 4

Lessons *(in hours)*: 56 lectures: 28 practices: 28

Type of the course: compulsory

Frequency of announcement *(per semester or year)*: per year

Academic year: 2022/23, 2nd semester

Subject code[1]: FOKOFRM254_2A

Lecturer of the course (tutor): Dr. Riba, Pál

Contact details: Department of Pharmacology and Pharmacotherapy, 1089 Budapest, Nagyvárad tér 4. Tel: +36-1-2104416, e-mail: riba.pal@med.semmelweis-univ.hu

Position: Deputy Head of Education of Department, associate professor

Date of habilitation and reference number: April 24 2017., 29/2017 Hab.

The goals of the course in point of view of the education:
Pharmacology deals with the effects, mechanisms of actions, adverse effects, interactions and clinical administration of drugs used in the clinical practice as well as with their fate in the body. It also specifies the rules of prescription writing. It is based on and synthesizes the knowledge of basic, pre-clinical and clinical subjects such as physiology, biochemistry, oral pathology and internal medicine.

Location of the course *(address of lecture hall, seminar room etc.)*:
NET, 1089 Budapest, Nagyvárad tér 4

Competences acquired by completion of the course:
Students understand the pharmacological terminology, learn the mechanism of action, therapeutic effects, adverse effects, important interactions of drugs and the basics of dosing. Knowing the basics of prescribing drugs is of an outmost importance.

Pre-study requirements and prerequisites of course registration and completion:
Pharmacology I., Internal medicine I

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

Student selection method in case of oversubscription:
N/A

Method of course registration: Through the NEPTUN system

Detailed course/lecture description[2]: *(to facilitate credit recognition in other institutions)*

1. Drugs used in coagulation disorders, drugs against bleeding. Agents used in anemias.
2. Antiarrhythmic drugs. Positive inotropic agents. Treatment of acute and chronic heart failure.
3. Diuretics and antidiuretics. Antihypertensive agents
4. Antihyperlipidemic drugs. Drugs acting on blood glucose control. Antidiabetics. Drugs used for treatment of angina pectoris. Drugs used for the treatment of peripheral vascular diseases.
5. Bronchodilators. Antiinflammatory agents used in bronchial asthma. Antitussive agents and expectorants. Histamin and antihistamines.

6. Corticosteroids. Pituitary hormones and hypothalamic hormones controlling their production. Hormonanalogs and hormone antagonists. Thyroid hormones and antithyroid drugs.
7. Estrogens and antiestrogens. Progestins and antiprogestins. Contraceptives. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity.
8. Toxicology in the dental practice. Drugs affecting bone mineral homeostasis.
9. Agents used for treatment of peptic ulcer and reflux disease. Antiemetic drugs. Laxatives and antidiarrheal drugs. Pharmacology of digestion, liver and biliary tract.
10. Immunopharmacology. Immunosuppressive drugs (cytotoxic agents, inhibitors of cytokine gene expression, antibodies and fusion proteins) Retinoids.
11. Introduction to anticancer chemotherapy. Cytotoxic antitumor agents.
12. Cancer chemotherapy: Small molecule cytostatic, signal transmission inhibitor anticancer drugs. Hormonal and other agents.
13. Cancer chemotherapy: Anticancer antibodies. Immunostimulant anticancer agents. Other drugs used in therapies of cancer
14. Pharmacodynamic and pharmacokinetic drug interactions. Contrast agents. Consultation

Courses *(obligatory and elective)* which in part or entirely overlap the topics of above course:
Medical and dental physiology, Dental biochemistry, Molecular Cell Biology, Pathology, General and Oral Pathophysiology, Internal Medicine,

Special academic work required for completion of the course[3]: -
N/A

Attendance on practices and lectures, replacement in case of missed sessions:
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.

Consequences of absence from sessions and exams:
According to the Study and Examination Policy of Semmelweis University

Method of checking acquired knowledge during the study period[4]:
Obligatory midterms are not organized. If the students ask it, 2 written midterms will be arranged.

Requirements of an accepted semester *(signature of the lecturer)*:
The number of absences must not be more than 25 percent of the number of practices in the semester

Type of the exam:
Oral final exam.

Exam requirements[5]:
In the oral final exam, at first 5 active substances selected from the compulsory list of active substances must be identified the and their mechanism of action explained. If the student does not recognize at least 3 of the active substances, he/she will not be allowed to continue and will receive a fail mark. After successful completion of three topics of three lists of topics (one from each), an acceptable level of knowledge of pharmacology must be demonstrated.

Topic list "A"

1. The stages of drug development in brief. Types of clinical trials.
2. Pharmacodynamics I (Molecular targets of drugs. Drug receptors. Receptor theory.)
3. Pharmacodynamics II (relation between drug dose and clinical response, therapeutic index, tolerance, pharmacodynamic drug interactions).
4. Drug absorption, distribution and bioavailability. Membrane transport mechanisms.
5. Drug biotransformation and excretion, linear and non-linear kinetics. Enzyme inhibitors and enzyme inducers. Clearance, half-life, loading and maintenance dose. Pharmacokinetic drug interactions
6. Drugs acting on gastrointestinal and urogenital smooth muscles. Drugs influencing uterine function. Histamine and antihistamines (H_1-blockers)
7. Cholinergic transmission and its presynaptic modification.
8. Adrenergic transmission and its presynaptic modification

9. Cholinomimetics
10. Muscarinic receptor blocking drugs
11. Catecholamines
12. Indirect sympathomimetics. Selective α_1 and α_2-agonists and drugs acting on the imidazoline receptors
13. α-receptor antagonists
14. β-receptor antagonists
15. Centrally and peripherally acting skeletal muscle relaxants
16. Local anesthetics
17. Natural opioids, opioid receptors
18. Semisynthetic and synthetic opioids
19. General properties of NSAIDs. Acetylsalicylic acid. Drugs used for treatment of gout.
20. NSAIDs, except acetylsalicylic acid. Non-opioid and adjuvant analgesics. Drugs for headache syndromes
21. Inhalational anesthetics
22. Intravenous anesthetics. Perioperative medication
23. Benzodiazepines
24. Non benzodiazepine anxiolytics and non-benzodiazepine hypnotics.
25. Antipsychotics
26. Tricyclic, tetracyclic and unicyclic antidepressants. MAO-inhibitors
27. Selective monoamine reuptake inhibitors.
28. Norepinephrine and serotonin receptor antagonist antidepressants. Agomelatine. Tianeptine. Agents used for treatment of manic phase of bipolar disorders.
29. Antiepileptics used in partial seizures and generalized tonic-clonic seizures except for the “broad spectrum” agents.
30. Antiepileptics used in absence seizures. “Broad spectrum” antiepileptic drugs. Drugs used for treatment of status epilepticus
31. Drugs acting in the extrapyramidal motoric system. Nootropic drugs
32. Types of biological drugs. Orphan drugs. Advanced Therapy Medicines (ATMPs)
33. Nutrients, traditional plant medicines, vitamins, anorectic drugs.

Topic list ”B”

1. Drugs influencing blood coagulation I: Antiplatelet agents. Fibrinolytic drugs. Drugs inhibiting bleeding
2. Drugs influencing blood coagulation II: Anticoagulant drugs
3. Agents used in anemias
4. Positiv inotropic drugs
5. Drugs influencing cardiac electrophysiology.
6. Drugs acting on the renin-angiotensin-aldosterone-system (RAAS)
7. Ca^{++}-channel blockers and other vasodilators
8. Drugs influencing the oxygen demand and oxygen supply of the heart. Drugs improving microcirculation.
9. Drugs affecting lipid metabolism.
10. Potassium excreting (wasting) diuretics
11. Potassium sparing diuretics, ADH antagonists, osmotic diuretics
12. Glucocorticoids for oral and parenteral use
13. Mineralocorticoids. Topically applied glucocorticoids. Adrenocortical antagonists, inhibitors of corticosteroid synthesis.
14. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity
15. Estrogens and antiestrogens
16. Progestins and antiprogestins. Contraceptives
17. Thyroid and antithyroid drugs. Pituitary hormones. Hypothalamic hormones, hormonanalogs and antagonists.
18. Pancreatic hormones and parenterally applied antidiabetic drugs.
19. Oral antidiabetics.
20. Agents affecting bone mineral homeostasis (calcium, vitamin D, parathyroid hormone, calcitonin, etc.).
21. Selective β_2-stimulants and other bronchodilators.

22. Antiinflammatory agents inhibiting bronchial inflammatory processes. Antitussive agents and expectorants
23. Drugs influencing gastric acid secretion, protective drugs of gastric mucosa
24. Antiemetic drugs. Prokinetic agents.
25. Drugs used in constipation (laxatives) and diarrhea. Drugs promoting digestion. Pharmacology of liver and biliary tract
26. Immunopharmacology I. (cytotoxic agents).
27. Immunopharmacology II. (Inhibitors of cytokine gene expression, 5-ASA derivatives)
28. Immunopharmacology III. (Antibodies and fusion proteins)
29. Drugs used in cancer treatment I (antimetabolites)
30. Drugs used in cancer treatment II (cytotoxic agents targeting DNA)
31. Drugs used in cancer treatment III (Topisomerase inhibitors. Inhibitors of mitotic spindle)
32. Drugs used in cancer treatment IV. (Hormonal agents)
33. Drugs used in cancer treatment V. (Small molecule signal transduction inhibitors. Retinoids)
34. Drugs used in cancer treatment VI. (Large molecule signal transduction inhibitors. Immunostimulant anticancer drugs.)

Topic list "C"

1. General considerations of antimicrobial therapy. Disinfectants and antiseptics
2. Antimycobacterial drugs
3. Antiprotozoal and antihelminthic drugs.
4. Antifungal agents
5. Agents to treat Herpes simplex (HSV), varicella-zoster (VZV) virus, cytomegalovirus (CMV). Anti-influenza agents Drugs against Corona- and other viruses
6. Antiretroviral agents.
7. Agents against hepatitis viruses
8. Penicillins
9. Cephalosporins
10. Carbapenems. Monobactams. Beta-lactamase inhibitors.
11. Chloramphenicol. Polymyxins. Antifolate drugs
12. Tetracyclines and glycylcyclines
13. Aminoglycosides
14. Quinolones and fluoroquinolones
15. Macrolides. Pleuromutilins
16. Clindamycin. Streptogramins. Oxazolidinones. Fusidans.
17. Glycopeptides. Lipopeptides. Bacitracin. Mupirocin.
18. Metronidazole. Fidaxomycine. Rifaximin. Nitrofurantoin. Phosphomycine.

Grading of courses[5]:

In the oral final exam, at first 5 active substances selected from the compulsory list of active substances must be identified the and their mechanism of action explained. If the student does not recognize at least 3 of the active substances, he/she will not be allowed to continue and will receive a fail mark. After successful completion of three topics of three lists of topics (one from each), an acceptable level of knowledge of pharmacology must be demonstrated.

Detailed information on the compulsory and the full lists of active substances. If the candidate:

1. knows all the active substances to be studied and their information, and can also mention the names of active substances from the full drug list – mark 5
2. knows all the active substances to be studied and the information to a varying degree and can mention the names of active substances from the full drug list to a varying degree - 2,3,4
3. knows all the active substances to be learned, but only the name and nothing else – unsatisfactory (failure)
4. does not know any active substance names – unsatisfactory (failure)
5. does not know all the active substances from the mandatory list, but knows the active substances from the full list of active substances in the given topic, then points 1,2 or 3 above are taken into consideration, the mark is awarded according to these points

Type of grade: five-mark scale (1=failure, 2=pass, 3=fair, 4=good, 5=excellent)

Exam registration:

Registration must be done through the NEPTUN system for the days set by the department up to the limits.
Rules of repeating exams: According to the Study and Examination Policy of Semmelweis University
List of textbooks, lecture notes and recommended textbooks: Basic and Clinical Pharmacology (Ed. B. G. Katzung), 15th edition, McGraw-Hill Education, 2021. ISBN 978-1 260 45231 0 Materials discussed during lectures and seminars: http://semmelweis.hu/pharmacology, Moodle (https://itc.semmelweis.hu)
Signature of course lecturer:
Signature of head of department:
Date of submission: May 11, 2022
Opinion of OKB:
Notes from the Dean's Office:
Signature of Dean:

[1] Filled out by the Dean's Office following approval
[2] Detailed and numbered for each week of theoretical and practical lessons one by one, indicating the names of lecturers and instructors
[3] Eg. field practice, medical chart analysis, survey conducting, etc.
[4] Eg. homework, report, midterm exam etc. Topics, dates, method of retake and replacement.
[5] Method of inclusion of theoretical and practical exams. Method of inclusion of midterm assessments.