

**Ministry of health of the Republic of Belarus
Educational institution
«Gomel State Medical University»**

Department of general and clinical pharmacology

Authors:

A.V.Sennikava, senior lecturer

E.I. Mikhailova, head of department, DMS, prof.

METHODOLOGICAL RECOMMENDATIONS

for a practical lesson on the discipline "Pharmacology"
for the third-year students of the Faculty of Foreign Students,
studying at the specialty 1-79 01 01 "General medicine"

**TOPIC 6: « FINAL (CONTROL) LESSON
ON GENERAL PHARMACOLOGY AND GENERAL PRESCRIPTION »**

Time: 3 hours

Approved at the meeting of the department of general and clinical pharmacology
the protocol № 18 of 30.06.2022

LEARNING AND EDUCATIONAL GOALS, OBJECTIVES, MOTIVATION FOR LEARNING THE TOPIC

The final lesson on general prescription and general pharmacology is a successive and concluding study of general prescription and general pharmacology, the knowledge of which will allow the mastery of the ability to manage the effects of drugs based on pharmacokinetic and pharmacodynamic principles, build an individual strategy of pharmacotherapy and prescribe drugs from different pharmacological groups and in different dosage forms.

Learning objective:

– formation of scientific knowledge about the main pharmacological effects, providing therapeutic and preventive effect of drugs on the topic of the class, indications and contraindications for their use, the interaction of drugs, their combined use for use in medical and preventive activities.

Educational purpose:

– to develop their value-personal, spiritual potential, to form the qualities of a patriot and citizen, ready for active participation in the economic, industrial, socio-cultural and public life of the country; to realize the social significance of their future professional activities, to learn to follow academic and work discipline, standards of medical ethics and deontology.

Tasks:

As a result of the study lesson, the student should

know:

– classification and basic characteristics of the studied drugs, pharmacodynamics and pharmacokinetics, indications and contraindications for their use, side effects;
– features of pharmacokinetics and pharmacodynamics, advantages and disadvantages of different dosage forms of these drugs;
– principles of research and testing of new drugs; information and reference and search systems;

be able to:

– analyze the effect of the studied drugs on the set of their pharmacological properties and the possibility of their use in medical practice; to write them in prescriptions;
– use different dosage forms of these drugs, based on the peculiarities of their pharmacodynamics and pharmacokinetics;
– work with scientific literature, search for information about the use and action of the studied drugs;

possess:

– skills in choice of drugs on the topic of the lesson;
– the rules of prescribing the studied drugs in the treatment of various diseases and pathological conditions, taking into account the indications;
– skills of dosage regime correction in case of pathological changes in functions of organs or systems responsible for biotransformation and elimination of drugs or in case of joint use of different drugs;

– skills to search, analyze and summarize information about the use and effects of the studied drugs.

Motivation for learning the topic:

– the specifics of training doctors in this specialty determines the need for students to purposefully study the main pharmacological effects, providing therapeutic and preventive effects of drugs on the topic of the class, indications and contraindications for their use, the interaction of drugs, their combined use, which will successfully complete the specialized disciplines of the specialty.

MATERIAL EQUIPMENT

Reference and informational literature, charts, tables, presentations, drug collections.

CONTROL QUESTIONS FROM RELATED DISCIPLINES

1. The subject of pharmacology. Terminology. Sources and stages of drug creation. Legislation in the field of drugs.
2. Principles of pharmacokinetics. Principles of drug dosing.
3. Biotransformation and excretion of drugs. Drug dosing regimen correction for changes in clearance and volume of distribution.
4. Pharmacodynamics of drugs.
5. State pharmacopoeia, its content and purpose. International pharmacopoeia. Pharmacy. Rules of storage and dispensing of medicines. Prescription, its structure.
6. Rules for registration of prescriptions for drugs in different dosage forms.
7. Peculiarities of prescribing narcotic, poisonous and potent drugs.

CONTROL QUESTIONS ON THE TOPIC OF THE CLASS

General pharmacology

1. Definition of pharmacology. The tasks of pharmacology as a science and educational discipline, its role and place in the system of public health and medical education.
2. The concept of drugs. Medicinal raw materials, drugs, dosage forms.
3. Sources of medicinal products. Scheme of research and introduction of new medicinal products in medical practice.
4. The concept of pharmaceutical science (pharmacy), structure and tasks.
5. State Pharmacopoeia, its content and purpose. Oficial dosage forms. International Pharmacopoeia. International (pharmacopeia) and trade (brand) names of medicines.
6. The main directions of drug therapy, directions of drug therapy.
7. The main methods of drug therapy (allopathy and homeopathy), their nature and use.
8. Chronopharmacology. Influence of biological rhythms on the drugs action.
9. Charmacogenetics. Idiosyncrasy.
10. General pharmacology, definition and its content. Pharmacokinetics of medicines, its parts.
11. Routes of drug administration (classification, comparative characteristics). Transdermal route of administration.

12. Sublingual, rectal, intranasal and inhalation routes of administration of drugs, their advantages and disadvantages.
13. Injectable routes of drug administration. Requirements for injection dosage forms.
14. Characteristics of subcutaneous, intramuscular and intravenous routes of administration of drugs.
15. Advantages and disadvantages of oral route of drug administration.
16. The main mechanisms of drug absorption, their comparative characteristics.
17. The concept of drug bioavailability. Transport across the biological membranes. Organism drug distribution, factors affecting it.
18. Drug elimination, its definition, components. Elimination rate constant, elimination half-life, definition, brief description.
19. Biotransformation, description, types and factors modifying it.
20. Drug excretion routes description. Quantitative indicators of drug excretion rate, their description.
21. The main pharmacokinetic parameters, their gist, dimensionality and role in drug characteristics.
22. Drug pharmacodynamics, definition, content.
23. Types (mechanisms) of drug action, their brief description.
24. Receptor mechanism of drug action, types of receptors. Drugs as ligands agonists and antagonists.
25. Drug interaction with specific receptors of bioactive substances. Role of adenylate cyclase, cAMP, guanylyl cyclase, cGMP and other secondary mediators (messengers) in drug action mechanism.
26. Brief description of drug final pharmacological effects.
27. Types of drug action. Description of main and side, reversible and non-reversible effects.
28. Types of drug action. Description of direct and indirect, selective and non-selective effects.
29. Types of drug action. Description of reflective, local and resorptive action.
30. Factors affecting pharmacokinetics and pharmacodynamics.
31. Drug action dependence on external factors. Dose (definition, classification). Margins of safety: therapeutic index.
32. Drug action dependence on physico-chemical properties (solubility, structure, stereoisomerism).
33. Drug action dependence on internal factors (age and sex, morbid condition of systems and organs regulating homeostasis). Features of drug administration to aged people and children.
34. Drug side effects, their types and basic methods of prevention.
35. Drug allergy, definition, clinical picture, diagnosis, prevention and treatment.
36. Drug dependence and toxicomania, definition. Medical and social aspects of control and prevention.
37. Drug induced superinfection (reasons, types, treatment and prevention).
38. Negative drug effect on embryo and fetus, types, prevention. Mutagenicity and carcinogenicity.
39. Phenomena occurring due to repeated drug use: tolerance, tachyphylaxis, and sensitization.

40. Drug accumulation, types. Phenomena of abrupt discontinuation of drug intake. Withdrawal effect, ricochet syndrome, abstinence.

41. Drug interaction, types. Types of synergy, its usage in medical practice.

42. Drug interaction. Types of antagonism (drug incompatibility), its use in medical practice.

General prescription

1. Prescription, definition and structure. Rules of drug prescribing.

2. Structure and aims of a drugstore. Poison (list A) and potent (list B) drugs storage regulation in the drugstores and treatment facilities.

3. Rules of prescribing of narcotic, psychotropic, poison and potent drugs. Regulatory documents.

4. Dosage form classification. Galenical and non-galenical preparations, their similarities and differences.

5. Liquid dosage form classification. Solutions for internal and external usage, definition and rules of writing out prescriptions, Latin names of solvents.

6. Tinctures and extracts definition and rules of prescribing.

7. Infusions, decoctions and mixtures, definition and rules of writing out prescriptions.

8. Description of injectable dosage forms. Requirements to injectable dosage forms. Rules of writing out prescriptions for prefabricated and drugstore manufactured injectable dosage forms.

9. Soft dosage forms: ointments, paste, liquid ointments (liniments). Latin name, brief description of ointment bases. Rules of writing out prescriptions.

10. Rectal and vaginal suppositories, definition. Rules of writing out prescriptions.

11. Solid dosage form classification. Powders, definition and rules of writing out prescriptions.

12. Tablets and dragee, definition and rules of writing out prescriptions.

PROCESS OF THE STUDY

1.

2.

3.

4.

5.

Theoretical part

Theoretical material on the topic of this lesson is presented in the methodological recommendations for lessons № 1-6.

Practical part

1. Check the theoretical material outlined by the student in lectures and practical classes.

2. Check the quality of the tasks in the workbook on the topic of the class.

3. Check the mastery of the methods of solving tasks and writing out prescriptions on the topic of the class.

Theme learning control

Conducted in the form of independent written work (solution of practical problems

and prescriptions for individual task).

METHODOLOGICAL RECOMMENDATIONS FOR ORGANIZATION AND EXECUTION OF STUDENTS' INDEPENDENT WORK (SIW)

The time given for independent work can be used by students for:

- preparing for the practical classes;
- completing the tasks on the topic of the class in the workbook;
- preparing thematic reports, essays and presentations;
- taking notes from academic literature.

The main methods of organizing independent work:

- completing tests and practical tasks of the electronic educational-methodical complex (EEMC) for self-monitoring and self-assessment.

The list of tasks of the SIW:

- solving practical problems in the EEMC;
- completing the test tasks of the EEMC.

Control of the SIW is carried out in the form of:

- assessment of an oral answer to a question, report, report, or solution of a task in a practical class;
- individual conversation.

METHODOLOGICAL RECOMMENDATIONS FOR ORGANIZATION AND EXECUTION OF CONTROLLED INDEPENDENT WORK OF STUDENTS (CIWS)

Recommended forms of CIWS organization:

- doing exercises on the topic of the class in the workbook;
- writing an essay on a given topic;
- preparing a report and a multimedia presentation on a given topic.

The list of tasks of the CIWS:

Topics of essays / multimedia presentations:

1. History of pharmacology: a contemporary view.
2. Complications of drug therapy.
3. The peculiarities of prescribing drugs during pregnancy and lactation.
4. Pharmacotherapy in childhood and old age.

Forms of control of CIWS realization:

- checking and grading an essay on a given topic;
- checking and grading a multimedia presentation on a given topic.

LIST OF REFERENCES

1. Kharkevitch, D. A. Pharmacology : textbook for med. students : transl. of 12th ed. of Russ. textbook "Pharmacology" (2017) / D.A. Kharkevitch. - 2nd ed. - Москва: ГЭОТАР-Медиа, 2019. - 676 с. : ил., табл. - Рек. ФГАУ "ФИРО". – Режим доступа: <http://www.studmedlib.ru/book/ISBN5970402648.html> – Дата доступа: 23.05.2022.

2. Кратко о лекарственных средствах : учеб.-метод. пособие для студентов 3 курса лечеб., мед.-диагност. фак. и фак. подг. спец. для зарубеж. стран, 6 курса лечеб. фак. и фак. подг. спец. для зарубеж. стран, аспирантов, магистрантов, учреждений мед. образования : в 2 ч. / Е. И. Михайлова [и др.]. – Гомель : ГомГМУ, 2019. – Ч. 1. – Гомель: ГомГМУ, 2020. – 56с. – Режим доступа:

<http://elib.gsmu.by/xmlui/handle/GomSMU/7128> – Дата доступа: 23.05.2022.

3. Кратко о лекарственных средствах : учеб.-метод. пособие для студентов 3 курса лечеб., мед.-диагност. фак. и фак. подг. спец. для зарубеж. стран, 6 курса лечеб. фак. и фак. подг. спец. для зарубеж. стран, аспирантов, магистрантов, учреждений мед. образования : в 2 ч. / Е. И. Михайлова [и др.]. – Гомель : ГомГМУ, 2019. – Ч. 2. – Гомель: ГомГМУ, 2020. – 76с. – Режим доступа:

<http://elib.gsmu.by/xmlui/handle/GomSMU/7129> – Дата доступа: 23.05.2022.

4. Rang and Dale's Pharmacology / J. M. Ritter [et al.]. - 9th ed. - Edinburg [et al.] : Elsevier, 2020. - xvi, 789 p. : ill., tab. + Student consult online.