

Ministry of Health of the Republic of Belarus
Education Establishment
"Gomel State Medical University"
Normal Physiology Department

It was discussed at the department meeting 30.08.16
The protocol № 8

METHODICAL INSTRUCTION

for carrying out classes by teachers with the 2nd course students
of Faculty for training specialists for foreign countries (teaching in English)
on normal physiology

Topic: Concluding class on the section "Physiology of blood"

General time of the class 4 hours.

**1. THE STUDYING AND EDUCATIONAL PURPOSES, THE MOTIVATION FOR
ASSIMILATION OF THE SUBJECT, REQUIREMENTS TO THE INITIAL LEVEL OF
KNOWLEDGE**

Purposes of the class

The fixing and control of the knowledge received on classes in the section "Physiology of blood".

Motivational characteristic of the subject

The student has to set knowledge of properties and functions of blood, to have modern ideas of blood test methods. The student has to own knowledge of reflex and humoral mechanisms of blood system regulation.

Tasks of the class

To set the theoretical and practical knowledge received on classes in the section " Physiology of blood".

As a result of carrying out the class the student has to:

To know:

- properties and functions of blood;
- reflex and humoral mechanisms of regulation of blood system;
- functional methods of blood tests;
- the basic concepts and terms on subject of the class;
- basic physiological constants on subject of the class.

To be able:

- to define and estimate parameters of blood system

2. CONTROL QUESTIONS ON THE CLASS SUBJECT:

1. Normal physiology - the science about mechanisms and processes of vital activity of the healthy person. Communication of physiology with other sciences. Physiology as epy scientific fundamental of medicine and assessment of the state of person health.

2. Subject, tasks and methods of physiology. Main stages of physiology development, the major openings and methodical approaches. An experiment as the main method of a research in physiology. Value of works of the academician I. P. Pavlov in development of world physiology.

4 The concept about physiological functions, and processes. Levels of the structurally functional organization of a human body. Bases of intercellular communication, information exchange and regulation of cell functions.

5. General principles of functioning of an integrated organism (correlation, regulation, reflex and self-regulation). Nervous and humoral mechanisms of a functions regulation, their characteristic. The concept about the systemic principle of the organization. Functional system (P.K. Anokhin).

5. Physiological concepts of a homeostasis as about constancy of internal medium of an organism and mechanisms of its regulation. Neurohumoral mechanisms of maintenance of constancy of organism internal medium.

6. The concept about internal medium of an organism. Liquid mediums of an organism (blood, lymph, intercellular liquid, intracellular liquid, liquor, etc.), their volume distribution in an organism. The concept about a blood system. Main functions of blood.

7. Quantity of blood at the person. The blood circulating and deposited. Hypovolemia and hypervolemia, their types. Hemorrhage consequences. Hematocrit, its size and changes at different types hyper- and hypovolemia. Diagnostic value.

8. Blood plasma, its structure and properties. Proteins of blood plasma, their characteristic, quantity and functions. Oncotic pressure of a blood plasma, its size and physiological value.

9. Physical and chemical properties of blood. Osmotic pressure, the factors determining it size. Hyper-, hypo - and isotonic (physiological) solutions. The viscosity and relative density of blood, factors defining them the size and physiological value.

10. Acid and base condition of blood. Active reaction (pH) of blood. Buffer systems of blood. Alkaline reserve. Acidosis, alkalosis, their types and origin.

11. Erythrocytes, features of their structure, property, structure, functions, quantity. Erythrocytosis. Anemia. Hemoglobin, its structure, properties, functions and quantity. Hemoglobin bonds. Kinds of hemoglobin, their distinctive properties.

12. Hemolysis, its types. Osmotic resistance of erythrocytes, its size. Diagnostic value. The Erythrocytes Sedimentation Rate (ESR), factors influencing its size. Diagnostic value.

13. Leucocytes, their classification, properties and functions. Leukocytic formula, its diagnostic importance. Leukocytosis, its types.

14. Thrombocytes, their structure, properties, quantity and functions. Vascular-platelet hemostasis, its phases.

15. Coagulation hemostasis. Plasma factors of blood coagulation. Factors of blood coagulation of uniform elements. Phases of coagulation hemostasis.

16. Fibrinolysis, factors it providing. Anticoagulative mechanisms. Anticoagulants, classification, physiological role. Regulation of blood coagulation and fibrinolysis.

17. Blood groups. ABO system. The factors defining group accessory of blood. Biological test. Rh factor. Essence of anti-D-prophylaxis. Basic principles of hemotransfusion.

18. Regulations of a hematopoiesis and blood system. Neurohumoral mechanisms.

19. Blood-substituting solutions and the main requirements imposed to them. Saline solutions. Colloid solutions. Blood preparations. Their positive and negative properties.

3. THE COURSE OF THE CLASS

- *Introduction*: Students ask the teacher questions which caused certain difficulties in the course of independent mastering of education material;

- *Check of level of knowledge of basic physiological constants of the section " Physiology of blood"*. Students fill in forms with constants which are distributed by the teacher.

- *Computer testing* is held in a computer class on the questions of the section.

- *Preparation for check of level of theoretical knowledge*. The teacher distributes to students the tickets containing three theoretical questions.

- *Control of level of theoretical knowledge* of students, is carried out by method of individual poll.

- *Preparation for check of level of practical skills*. The teacher distributes to students the tickets containing two questions on practical skills.

- *Control of level of knowledge of practical skills* of students, is carried out by method of individual poll with the subsequent performance of laboratory works.

- *Summing up, exposure of estimates.* At the end of the class the teacher makes the conclusion about the level of knowledge of students, focuses attention on the general mistakes made by students at answers to theoretical questions and when performing laboratory works.

Note: time of breaks is 15 minutes during a class.

LITERATURE

Basic

1. Human physiology: textbook for overseas students = Физиология человека: учеб. пособие для иностранных студентов, обучающихся на английском языке / А. И. Киеня [и др.]; под ред. проф. Э. С. Питкевича; пер. на англ. яз. Р. А. Карпов, В. А. Мельник. — Гомель: УО ГогМУ, 2009. — 352 с.

2. Сборник нормативных документов по проблеме ВИЧ/СПИД. Минск, 1999. 132 с. Приказ № 351 от 16.12.1998г. Приложение № 8 «Инструкция о профилактике внутрибольничного заражения ВИЧ-инфекцией и предупреждению профессионального заражения мед. работников». С. 31-35.

3. Text of lectures.

Alternate

1. Textbook of medical physiology // C. Guyton, 2006. — 1116 p.

2. Human anatomy and physiology // Alexander P., Spence-Elliott B. Masson.

3. Human physiology. The mechanisms of body function // Arthur J. Vander James H Sherman Dorothy S. Luciano, 1986. — 715 p.

4. Lecture notes on human physiology // John J Bray, Patricia A. Cragg, Anthony D.C. Macknight, Roland G. Mills and Douglass W. Taylor.

5. Human anatomy and physiology // Elaine N. Marieb, 1989. — 995 p.

6. Review of medical Physiology, International edition, 2003. — 912 p.