

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:** Subject and methods of physiology. Instructions on safety rules.  
Method of blood taking from finger.

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**

#### **Motivational characteristic of the topic**

The general clinical blood test is one of the most widespread laboratory researches. For its carrying out the capillary blood is often used. Therefore each student has to master the method of taking blood from a finger at the level of ability.

#### **Purposes of the class**

Students should be informed of safety rules on operation with electric devices and chemicals in laboratories of the department, rules of behavior in classes of department, the subject of normal physiology, its tasks and methods of physiological researches, rules of carrying out practical classes and registration of practical work protocols. Students should formulate the concept about homeostasis as the constancy of the internal environment, about functions of an organism and mechanisms of their regulation and about a role of the liquid mediums for activity of an organism.

#### **Tasks of the class**

To pass a personnel safety instructing at carrying out educational and scientific works in educational audiences of department. To repeat rules of work with blood, in order to avoid infection with the AIDS virus, hepatitis. During the course of the class students have to get acquainted with technology of taking blood from a finger and to examine fresh blood preparation under a microscope.

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

#### **To know:**

- rules of safety measures during the work with electric devices and chemicals in laboratories of department;
- rules of behavior in audiences of department;
- subject of normal physiology, its task and methods of physiological researches;
- rules of carrying out practical classes and registration of practical work protocols,
- the basic concepts and terms on the class topic,
- basic physiological constants on the class topic.

**To be able:**

To master a technique of taking blood from a finger.

**2. CONTROL QUESTIONS FROM RELATED SUBJECTS:**

1. Structurally functional characteristic of a blood.
2. Measures of prophylaxis of becoming infected.

**3. CONTROL QUESTIONS ON THE CLASS SUBJECT:**

1. Normal physiology - science about mechanisms and processes of vital activity of the healthy person. Connection of physiology with other sciences. Physiology as the scientific fundamental of medicine and of the assessment of the person health state.
2. Subject, tasks and methods of physiology. Main stages of development of physiology, the major discovering and methodical approaches. Experiment as the main method of research in physiology. Value of works of the academician I.P. Pavlov in development of world physiology. Value of physiology for medical education and profession of a doctor.
3. 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.
4. General principles of functioning of an complete organism (correlation, regulation, reflex and self-regulation). Nervous and humoral mechanisms of functions regulation, their characteristic. Concept about the systemic principle of the organization. Functional system (P. K. Anokhin).
5. Physiological ideas of a homeostasis as about constancy of internal environment of an organism and mechanisms of its regulation. Neurohumoral mechanisms of maintenance of constancy of organism internal environment.
6. Concept about blood system. Main functions of blood. Quantity of blood in human. Hypo - and a hypervolemia. Depot of blood and its value.

**Questions for independent studying**

1. Brief history of development of physiology in Russia and Belarus.
2. Basic principles of studying of physiology. Methods of physiological researches. Features of carrying out physiological experiment. Alternative methods in education.

**4. PRACTICAL PART OF THE CLASS**

Laboratory work 1.1 Technique of taking blood from a finger.

Laboratory work 1.2 Examination of a fresh blood sample under a microscope.

**5. THE COURSE OF THE CLASS**

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

- *Requirements to the initial level of knowledge*: From anatomy and histology students should know the morpho-functional characteristic of the liquid environments of an organism;

- *Correction of the initial level of knowledge*: The teacher checks and adds the initial level of knowledge of students on theoretical and application-oriented questions on the subject of the class "Introduction in physiology. System of blood", research methods in physiology, the basic concepts and terms. Mechanisms of functions regulation. In the section "Blood" questions about composition and functions of blood, organs of blood depot are discussed. The teacher corrects the answers of students on the considered subject;

- *Setting of problems which will be solved by students*: - The teacher sets the task to master at the level of ability the technique of taking of capillary blood from a finger with observance of measures of infection prevention, and also to examine a fresh preparation of blood under a microscope.

- *Independent performing of tasks by students:* Students make out the protocol of laboratory work with the subsequent discussion of a technique of its performance;
  - students perform practical work under monitoring of the teacher or laboratory assistant. For performing of the work students are provided with methodical manuals, microscopes, one-time scarificators, gloves, disinfectants. Visualization is provided by tables, figures, the diascope;
  - *Assessment of final level of knowledge of the class subject:* - The teacher specifies the final level of knowledge of students on theoretical and practical questions, the basic concepts and terms, and also knowledge of basic physiological constants of the class subject;
  - *Viewing of the video movie*
  - *Fixing of knowledge:* The teacher suggests students to solve several situation-dependent problems on the class subject, to pass computer test on the class subject;
  - *The conclusion of the teacher and the task to the next class:* At the end of the class the teacher makes the conclusion about the carried-out work and tells students the home task for the independent work. Then summing up the results of the class and signing of experience protocols, and also an assessment of practical skills in an account leaf is carried out.
- Note: time of breaks is 15 minutes during a class.*

## 6. QUESTIONS FOR SELF-CHECKING OF KNOWLEDGE

1. What is blood volume in a human body? What (allegedly) mechanisms promote her restoration after blood loss?
2. What systems in an organism participate in maintenance of a homeostasis?
3. What is the level of blood loss as a percentage if as a result of a trauma a person has lost 1,5 l of blood? The weight of the person was 75 kg.
4. The newborn child weighs 4 kg. How much blood has to be in his organism?
5. The person has lost 20% of blood. What quantity of erythrocytes, approximately, he has to have after 1 hour and after 1 day?

## 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 ГoГМУ, 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.