

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:** Conditionally-reflex activity of CNS

The 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**

To create a concept about integrative processes at various levels of an organism; a concept about the role of the congenital and acquired forms of adaptive reactions at adaptation of an organism to conditions of existence medium.

**Motivational characteristic of the subject**

Cortex of cerebrum and subcortical structures are the highest department of CNS of the person. The main function of this department – performing of the difficult behavioural reactions of an organism (behavior) making a basis of higher nervous activity. Knowledge of integrative processes at various levels of an organism, forms of adaptive reactions to the changing conditions of existence medium is necessary for the medical student.

**Tasks of the class**

In the course of the class students have to study development conditions, mechanisms of formation of conditioned reflexes and their role in adaptive activity of an organism. To master a technique of definition of short-term acoustical memory volume.

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

**To know:**

- levels of integration of brain and their interrelation;
- congenital forms of behavior and their physiological role;
- types of conditioned reflexes and mechanism of formation;
- physiological essence of dynamic stereotype;
- types of inhibition of mental activity.

**To be able:**

- To apply methods of research of simple sensomotor reactions.
- To use mechanisms of development of conditioned reflexes.

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

1. Morphofunctional features of cortex of cerebrum and subcortical structures, their interrelations.

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

1. Integrative functions of brain. Integration levels.
2. Congenital forms of behavior (unconditioned reflexes and instincts).
3. The conditioned reflex as a form of adaptation of animals and the person to the changing living conditions.
  - 3.1. Rules and physiological mechanisms of formation of conditioned reflexes.
  - 3.2. Classification of conditioned reflexes.
4. Analytic- synthetic activity of cortex of cerebrum. A dynamic stereotype, its physiological essence, value for training and acquisition of labor skills.
5. Types of inhibition of mental activity.
  - 5.1. External (unconditional) inhibition of reflexes (protective inhibition, the fading brake).
  - 5.2. Internal (conditional) inhibition of reflexes: fading, differentiating, conditional brake, late inhibition.

### 4. PRACTICAL PART OF THE CLASS

Laboratory work 33.1. Development and suppression of conditioned pupillary reflex to the bell in person

Laboratory work 33.2. Investigation of period of simple sensomotor reactions

### 5. THE COURSE OF THE CLASS

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

- *Demands to the initial level of knowledge*: From sections of anatomy, histology, students have to know morphofunctional features of cortex of cerebrum and subcortical structures, their interrelations, at home during preparation of control questions students have to give in workbooks the main definitions on the subject.

- *Assessment of level of knowledge of students*: The student answers control questions on the class subject "Conditionally-reflex activity of CNS". Questions of congenital forms of behavior, of conditioned reflexes and inhibition of reflexes are considered. The teacher specifies the class methods, the basic concepts, answers of students on the considered subject;

- students read reports on the class subject with the subsequent discussion;

- *Statement of problems which will be solved by students*: The teacher sets a task to study development conditions, mechanisms of formation of conditioned reflexes and their role in adaptive activity of an organism. To study time of simple sensomotor reactions.

- *Independent performance of tasks by students*:

- students make out the protocol of laboratory work in workbooks with the subsequent discussion of a technique of performance;

- students perform practical work under control of the teacher or laboratory assistant. For performance of work students are provided with methodical guiding and the necessary equipment. Presentation is presented by tables, drawings.

- students report the paper on the class subject with the subsequent its discussion.

- *Assessment of final level of knowledge of an the class subject*: The teacher specifies the final level of knowledge of students of theoretical and practical questions, the basic concepts and terms, and also knowledge of basic physiological constants of an the class subject;

- Viewing of the video "Behaviour: Instinctive reflexes. Conditioned reflex".

- *Fixing of knowledge of students*: Students solve situational problems of a subject of the class and answer test questions;

- *The conclusion of the teacher and a task to the next the class:* At the end of the class the teacher does the conclusion about the carried-out work, students receive the home task for independent work. Summing up is carried out and protocols of experience are signed.

*Note: time of breaks of 15 minutes during the class.*

#### 6. QUESTIONS FOR SELF-CHECKING OF KNOWLEDGE

1. One of I. P. Pavlov's employees invited him to experience in which the conditioned reflex at a dog was always shown. Earlier experiments were made so that the experimenter and an animal were one in the room. In the presence of I. P. Pavlov the conditioned reflex wasn't reproduced, and after its leaving – was restored. What is the physiological mechanism of this phenomenon?

2. During the sports meets at "fans" emergence of changes of cardiovascular system activity is possible. What is emergence of such disturbances bound to?

3. Analyse and describe presumable physiological mechanisms of reactions on recovery of the provision of a body at equilibrium disturbance; inhibition of the car by the driver, the goalkeeper at playing hockey, soccer, etc.

4. Call common features and differences between unconditional and conditional types of inhibition

#### 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. 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.