

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:** Memory mechanisms.

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 at the level of knowledge of idea of brain integrative activity as to a physiological basis of mental functions. To get acquainted with types and mechanisms of thinking and memory, mechanisms of consciousness and subconscious mind, to examine classification and physiological implications of emotions and an emotional stress.

**Motivational characteristic of the subject**

Neurophysiological and psychological processes are closely bound and reflect activity of the highest department of the central nervous system of the person, in providing individual organism adaptation to the changing conditions of medium. Knowledge of integrative activity of brain as to a physiological basis of formation of thinking and memory, consciousness and subconscious mind, and also emotions and an emotional stress is necessary for the medical student.

**Tasks of the class**

To study types and mechanisms of thinking and memory and their role in training processes; to study consciousness as the highest form of mental activity. To study classification and neurophysiological mechanisms of formation of emotions and an emotional stress.

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

**To know:**

- physiological bases of thinking and its types;
- a concept about physiological bases of consciousness;
- memory mechanisms, its types;
- emotions their biological value and classification;
- general adaptic syndrome, stress.

**To be able:**

- to define the prevailing memory type at the examinee;
- to determine the volume of short-term acoustical memory
- to estimate attention by means of proof assay.

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

1. Morphofunctional characteristic of cortex and subcortical structures.

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

1. Thinking, its types.
2. Consciousness, subconsciousness, superconsciousness. A concept about physiological bases of consciousness. Medical criteria for evaluation of consciousness of the person.
3. Memory, its types and its value in formation of integrated adaptive reactions
  - 3.1. A role of various departments of brain in perception, storage and procreation of information. Mechanism of short-term and long-term memory. A concept about an amnesia and its types.
4. Emotions and their biological value.
  - 4.1. Classification. Theories of emotions. Vegetative, behavioural and endocrine implications.
  - 4.2. The role of structures of brain in formation of emotions.
  - 4.3. Emotional pressure as risk factor for health. Negative emotions in a genesis of psychosomatic diseases. Emotional stress.
  - 4.4. General adaptive syndrome, stress. Participation of endocrine glands in adaptive activity of an organism. A concept about a stress-realizing and a stress-limiting systems of an organism.

### Questions for independent studying

1. Behavioural and motivational mechanisms of brain.

#### Report:

1. Value of works of L. S. Vygotsky in psychology.
2. Reserves and ways of improvement of memory. How to prepare for examination.
- 3 Mysterious phenomena of human mentality (telepathy and intuition, clairvoyance, healing, telekinesis, meditation, zombiing).
- 4 How to control emotions. Ways of disposal of stress.
5. A role of theory of higher nervous activity in studying of processes of consciousness, subconscious mind and superconsciousness.
6. Development of abstract thinking in the person.

### 4. PRACTICAL PART OF THE CLASS

Laboratory work 35.1. Definition of dominating type of memory

Laboratory work 35.2 Definition of short-term acoustical memory volume.

Laboratory work 35.3 Assessment of parameters of attention by means of proof assay.

### 5. THE COURSE OF THE CLASS

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

- *Demands to the initial level of knowledge:* from sections of anatomy, histology, students have to know morphofunctional features of cortex of cerebrums and subcortical structures.

- *Correction of initial level of knowledge:* The teacher checks and supplements the initial level of knowledge of students of theoretical and applied questions on the class subject "Memory mechanisms". Questions of mechanisms of memory, thinking, consciousness as to the highest form of mental activity, and also emotions and emotional stress are considered. The teacher corrects answers of students on a subject.

- *Statement of problems which will be solved by students:* The teacher sets a task to study mechanisms of thinking and memory and their role in training processes; to study consciousness as the highest form of mental activity; biological role of emotions and emotional strain as risk factor.

- *Independent performance 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 control of the teacher and laboratory assistant. For work performance students are provided with methodical guiding, questionnaires, tables. Presentation is provided by tables, drawings.

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

- *Assessment of final level of knowledge of the class subject:* The teacher specifies the final level of knowledge of students of theoretical and practical questions, the basic concepts and terms.

- Viewing of the video

- *Fixing of knowledge:* The teacher suggests students to solve several situational problems of an the class subject, to pass computer test.

- *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 and offers students the home task for independent work. Then summing up the class and signing of protocols of experience is carried out.

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

## 6. QUESTIONS FOR SELF-CHECKING OF KNOWLEDGE

1. What is the risk for health of the person immediately at the long and expressed emotional pressure?

2. What is the difference of concepts and values for adaptation of an organism of states "eustress" and "distress"?

3. What functions and parameters of behavioural reaction are provided by "an acceptor of result of action" on P.K.Anokhin?

4. What does the sense of the concept "interaction" of systems of an organism at performing of difficult integrative processes or behavioural reactions of an organism consist in? Give examples of "interaction" of systems?

## 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 ГомМУ, 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.