

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: Types of higher nervous activity. Mental working capacity.

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 ideas of the first and second signal systems; about the HNA types; about features of higher nervous activity of the person and its difference from higher nervous activity of animals. To find out sleep mechanisms.

Motivational characteristic of the subject

The neurophysiological processes providing variety of forms of interaction of the person with the outside world it is carried out with immediate participation of cortex of cerebrum and the subcortical structures adjoining to it. Therefore knowledge of neurophysiological processes of brain as physiological basis of mental functions, about the main differences of integrative activity of brain of the person and the highest animals, about the HNA types is necessary for the medical student.

Tasks of the class

In the course of the class students have to create idea of bases of integrative activity of a brain of the person.

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

To know:

- first and second signal system;
- characteristic and classification of the HNA types;
- disturbance of HNA;
- phases and mechanisms of sleep.

To be able:

To reveal features of HNA at people and functional asymmetry of cortex.

2. CONTROL QUESTIONS FROM RELATED SUBJECTS:

1. Morphofunctional features of cortex of larger hemispheres. Localization of functions in cortex.

3. CONTROL QUESTIONS ON THE CLASS SUBJECT:

1. First and second signal systems. Speech, functions of the speech. The functional asymmetry of cortex bound to development of the speech in the person. Speech centers. Types of aphasias.

2. I. P. Pavlov's doctrine about the HNA types, their classification and the characteristic. Features of higher nervous activity of the person and its difference from higher nervous activity of animals.

3. Disturbances of HNA. Experimental neuroses.

4. Condition of a sleep and wakefulness.

4.1. Sleep phases. Changes of an electroencephalogram, somatic, vegetative and endocrine functions during sleep and wakefulness.

4.2. Modern ideas of sleep mechanisms. Theories of sleep. Dreams, their origin and value.

Questions for independent studying:

1. Methods of studying of higher nervous activity. Principles of the reflex theory.

Reports:

1. Age features of HNA.

2. HNA types.

3. First and second signal systems.

4. Neurophysiological mechanisms of processes of a sleep.

4. PRACTICAL PART OF THE CLASS

Laboratory work 34.1. Detection of the higher nervous activity features of a person depending on prevalence of I or II signal system

Laboratory work 34.2. Definition like HNA on indicators of force, steadiness and mobility of nervous processes

Laboratory work 34.3. Definition of the type of human working capacity («owl-lark» test)

Laboratory work 34.4. Research of functional asymmetry of brain

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;

- *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.

- *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 "Types of higher nervous activity". Questions of the first and second of signal systems of the person, of features of HNA at the person, types and disturbances of HNA, conditions of sleep and wakefulness are considered. The teacher corrects answers of students on a 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 the main differences of integrative activity of a brain of the person and the highest animals; study I. P. Pavlov's doctrine about HNA and its types and disturbances; to reveal features of HNA at people depending on prevalence of I and II signal systems, to get acquainted with modern ideas of sleep mechanisms.

- *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, and questionnaires. Presentation is provided by the diagram, drawings.

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.

- 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. How to develop a conditioned reflex at the person, without using numerous combination of a conditional stimulus to unconditional?

2. The graduate of school makes the choice between two higher education institutions: financial-economic and flight school. What advice can be given to the young man if he has strong balanced inert type of HNA?

3. It is well-known that with age people are less and less inclined to change of the schedule and the habits which developed for many years. To what physiological mechanisms is it bound?

4. Melancholic and choleric persons are with other things being equal more subject to neurotic disorders. Whether it is possible to speak about lower social value of people with such HNA types?

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.