

## Physiology - the Science of Life Processes

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**Annotation:** This article is devoted to the issue of the basic role of physiology in medical practice. The characteristics of physiology are presented and the directions of its development are indicated. A brief history of the development of physiological science is given with an emphasis on the Russian tradition. The thoughts of great physiologists about the basic role of physiology in medicine are presented. The physiological mechanisms of the relationship between doctor and patient are described. All of the following allows us to conclude that physiology provides not only theoretical knowledge for clinical medicine, but also a philosophical basis for medical practice in general.

**Keywords:** Physiology, reflex theory, theory of functional systems, systemic quantization of behavior.

**Relevance.** Physiology is a medical and biological science that is of great importance for the medical practice of a doctor. Great physiologists of the 19th–20th centuries. J. Prohaska, C. Bernard, I.M. Sechenov, I.P. Pavlov, P.K. Anokhin, K.V. Sudakov considered physiology one of the fundamental sciences that develops clinical knowledge. However, in the last decade, medicine has been enriched with new molecular, immune and genetic discoveries. In this regard, the question arises about the significance of physiology in the modern complex of medical knowledge. What is the role of physiology in shaping the clinical thinking of a doctor? Does physiology provide information only about the functional processes of the body, or is it more important, shaping the doctor's investigative type of thinking? In connection with the anniversary of the birth of the founder of Russian physiology I.M.

Sechenov's analysis of the role of physiology in medicine is important for the training of new medical personnel. Physiology is the science of the vital processes of the body. Physiology studies the functional processes in the body, the regulation and self-regulation of these processes, the interaction of the body with the external environment and the exchange of information between individuals. From the perspective of the theory of functional systems, the subject of physiology is the interactions of various functions of the body, providing systemic patterns aimed at maintaining the vital activity of the body as a whole.

Distinguish between the physiology of plants, animals and humans. Human physiology includes normal physiology, which studies the functions of tissues, organs and systems in a healthy body, pathological physiology, which studies pathological processes in the body, and clinical physiology, which studies changes in functional processes in the body in various diseases. Normal physiology is divided into molecular cellular, organ, reflex and systemic physiology. The first of them is the most modern part of physiology, focusing on cellular and molecular processes in the body, on the organization of processes in cell membranes, on the role of organelles and the cytoplasmic matrix, on molecular and biochemical processes in the nucleus and cytoplasm of cells.

Organ physiology is the most traditional part of physiology, studying the functions of individual organs and tissues of the body.

Reflex physiology studies the neurohumoral regulation of body functions. Systems physiology is focused on the study of mechanisms of self-regulation of body functions with the help of functional systems, on the study of mechanisms for maintaining homeostasis necessary for vital processes, on systemic mechanisms for organizing goal-directed behavior and mental functions of a person. Physiologists do not observe boundaries between different areas of physiology, and the physiology of every major scientist represents a conglomerate of scientific knowledge. The textbooks on cellular and molecular physiology include elements of reflex physiology and ideas about homeostasis, which is one of the basic concepts of systemic physiology. Textbooks on the theory of functional systems of the body include descriptions of reflexes and explanations of the basic cellular and molecular mechanisms of regulation of physiological functions.

Physiology has no clear boundaries separating it from other medical sciences. She extends her interests both in breadth, studying the pathological processes of the body and the mechanisms of the occurrence of diseases, and in depth, being interested in both the physicochemical mechanisms of the functional processes of the body and the mental functions of humans. Therefore, it is necessary to determine that conventional boundary, that limit of knowledge in physiology that is necessary for the training of future doctors. Therefore, the content and scope of physiological knowledge may differ at different universities, despite the uniform "Federal State Standard" for the training of medical specialists in Russia.

The complexity of physiological knowledge leads to erroneous interpretations of individual functional processes of the body in textbooks on physiology. This is due to the different levels of training of physiology professors and the difference in their scientific interests. Some teachers have a deeper understanding of certain sections of physiology, while others - in others. Therefore, there is no ideal textbook on physiology. Students have to use lecture material and teaching aids recommended by the Department of Normal Physiology as the core of their knowledge. Preparing students using textbooks not recommended by the department or obtaining information from the Internet usually leads to poor results in the exam. Physiology is an experimental science. All its theoretical provisions, laws and properties are formulated on the basis of numerous experiments on animals and studies of the functions of healthy and sick people.

Despite the large volume of accumulated factual material, physiology is a dynamically developing science, replenished with new knowledge about the molecular and systemic processes of the body. Physiology is a complex body of knowledge that includes information from various sciences. She uses knowledge from biology, physics, chemistry, mathematics, cybernetics, anatomy, histology, biophysics, immunology, and genetics. Philosophical patterns of organization of material and ideal processes are used in sensory physiology, higher nervous activity and the section of general principles of organization of living beings. Some branches of physiology are closely related to each other by similar patterns. However, most sections of physiology describe the organization of body functions different from other sections. When analyzing some functions of the body, knowledge of chemistry is used, when describing other sections - knowledge of physics, and still others - knowledge of biophysics and molecular biology.

To properly prepare for the physiology exam, a student needs to know not only the functional processes of the body, but also basic sciences. The depth of study of physiology differs significantly in a medical college and a medical university. Secondary medical education includes knowledge of particular issues of physiology. Higher medical education shapes the physiological

thinking of a doctor. The doctor may forget many parameters of homeostasis and individual mechanisms of functional processes. But he must be able to analyze possible neurohormonal interactions of functions in the body, be able to foresee the dynamics of changes in these functions during the development of the disease and during the patient's recovery. Physiological knowledge is used by many clinical disciplines.

Therapy and surgery are based on knowledge of the physiology of circulation, blood, respiration, digestion, metabolism and energy, thermoregulation, and excretion. Pharmacology uses knowledge about the physiology of excitable tissues and the nervous system. Knowledge of the hormonal regulation of body functions is needed for endocrinology, therapy and surgery. Urology and gynecology uses material on the physiology of the genitourinary system. Neurology, psychiatry and medical psychology are based on the physiology of the nervous system, sensory systems and higher nervous activity. Knowledge of the functions of analyzers is used in otorhinolaryngology and ophthalmology. The formation of physiology as the theoretical basis of medicine.

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