

## PHYSIOLOGY IS THE SCIENCE OF LIFE PROCESSES

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**Abstract:** This article is devoted to the issue of the basic role of physiology in medical practice. The characteristics of physiology are presented, the directions of its development are outlined. A brief history of the development of physiological science is given with an emphasis on the Russian tradition. The thoughts of great physiologists on the basic role of physiology in medicine are presented. The physiological mechanisms of the relationship between a doctor and a 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.

**Key words:** Physiology, reflex theory, theory of functional systems, systemic quantization of behavior

Physiology is a medical and biological science that is of great importance for the medical activity of a physician. The great physiologists of the 19th–20th centuries J. Prochazka, K. Bernard, I.M. Sechenov, I.P. Pavlov, P.K. Anokhin, K.V. Sudakov considered physiology to be 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 importance of physiology in the modern complex of medical knowledge. What is the role of physiology in the formation of a physician's clinical thinking? Does physiology provide information only about the functional processes of the body, or is it of greater importance in forming a physician's research type of thinking? In connection with the anniversary date of the birth of the founder of Russian physiology, I.M. Sechenov, the analysis of the role of physiology in medicine is important for the training of new medical personnel. Physiology is the science of the life 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 standpoint of the theory of functional systems, the subject of physiology is the interaction of various functions of the body, providing systemic patterns aimed at maintaining the life of the body as a single whole.

A distinction is made between plant, animal and human physiology. Human physiology includes normal physiology, which studies the functions of tissues, organs and systems in a healthy organism, pathological physiology, which studies pathological processes in the organism, and

clinical physiology, which studies changes in functional processes in the organism during various diseases. Normal physiology is divided into molecular-cellular, organ, reflex and systemic physiology. The first of these is the most modern part of physiology, focusing on cellular and molecular processes in the organism, on the organization of processes in cellular membranes, on the role of organelles and 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 organism.

Reflex physiology studies the neurohumoral regulation of body functions. Systemic physiology focuses on the study of the mechanisms of self-regulation of body functions using functional systems, on the study of the mechanisms of maintaining homeostasis necessary for life processes, on the systemic mechanisms of organizing goal-directed behavior and mental functions of a person. Physiologists do not observe the boundaries between different areas of physiology, and the physiology of each major scientist is a conglomerate of scientific knowledge. Textbooks on cellular and molecular physiology include elements of reflex physiology and ideas about homeostasis, which is one of the main concepts of systemic physiology. Textbooks on the theory of functional systems of the body include a description of reflexes and explanations of the main cellular and molecular mechanisms of regulation of physiological functions.

Physiology has no clear boundaries separating it from other medical sciences. It extends its interests both in breadth, studying the pathological processes of the body and the mechanisms of disease occurrence, and in depth, being interested in both the physicochemical mechanisms of the functional processes of the body and the mental functions of man. Therefore, it is necessary to determine that conditional boundary, that limit of knowledge in physiology, which is necessary for the training of future doctors. Therefore, the content and volume of physiological knowledge may differ in different universities, despite the unified "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 physiology textbooks. This is due to the different levels of training of professors in physiology and the differences in their scientific interests. Some teachers have a deeper understanding of some sections of physiology, while others have a deeper understanding of others. Therefore, there is no ideal physiology textbook. Students have to use lecture material and textbooks 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 a poor result on 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 humans.

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 of knowledge, including information from various sciences. It uses knowledge from biology, physics, chemistry, mathematics, cybernetics, anatomy, histology, biophysics, immunology, 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 sections of physiology are closely related to each other by similar patterns. However, most sections of physiology describe

a different organization of body functions from other sections. When analyzing some body functions, knowledge of chemistry is used, when describing other sections - knowledge of physics, and still others - knowledge of biophysics and molecular biology.

For high-quality preparation for the physiology exam, a student must know not only the functional processes of the body, but also the basic sciences. The depth of physiology study differs significantly in a medical college and a medical university. Secondary medical education includes knowledge of specific issues of physiology. Higher medical education forms the physiological thinking of a doctor. A doctor can forget many parameters of homeostasis, 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 a disease and during the recovery of the patient. Physiological knowledge is used by many clinical disciplines.

Therapy and surgery are based on knowledge of the physiology of blood circulation, blood, respiration, digestion, metabolism and energy, thermoregulation, excretion. Pharmacology uses knowledge of the physiology of excitable tissues and the nervous system. Knowledge of hormonal regulation of body functions is needed for endocrinology, therapy and surgery. Urology and gynecology use 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 otolaryngology and ophthalmology. Formation of physiology as a theoretical basis for medicine.

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