

## WHY DO STUDENTS OF MEDICAL SPECIALTIES IN HIGHER EDUCATION NEED MEDICAL PHYSICS?!

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### Abstract

In the article, the purpose of teaching medical physics to students of medical higher education institutions and the intended results were analyzed. The importance of the science of medical physics in the formation of skills in the use of physical devices and radiation, medical and diagnostic devices and technologies was also discussed.

**Keywords:** Medical physics, radiology, X-rays, iridology, physiotherapy, laser, radiodiagnosis, cardiopulmonary.

Medical physics is the science of systems consisting of physical devices and radiation, medical-diagnostic devices and technologies. The purpose of medical physics is the study of systems for treating patients, as well as preventing and diagnosing diseases, using the methods and tools of physics, mathematics and engineering. The nature of diseases and the mechanism of healing often have a biophysical explanation [1,2,3].

In fact, should medical students study the formulas of the laws of physics and deal with the laws of several scientists such as I. Newton, M. Faraday and J. Maxwell? Some do not see the connection between this fascinating science and medicine. Let's check this connection!

Physics, technology and medicine are sciences about natural phenomena and human diseases, treatment and prevention of these diseases [4,5,6].

Currently, the direction of broad relations between these disciplines is constantly expanding and strengthening. For example, subjects such as medical physics and medical technology. No field of medicine does not use tools - equipment and techniques that work based on physical laws.

The development of scientific medicine would not have been possible without advances in physics and technology, methods of objective examination of the patient and methods of treatment. The achievements of physical and technical sciences are widely used in therapy, surgery and other fields of medicine. Medical physics is the science of systems consisting of physical devices and radiation, medical and diagnostic devices and technologies. The laws of physics help diagnose diseases. X-rays, ultrasound, iridology, and radiodiagnostics are widely used [7,8].

Radiology is a branch of medicine that studies the structure and function of organs and systems and uses X-rays to diagnose diseases.

X-rays are invisible electromagnetic radiation. Penetrates through certain materials that are opaque to visible light. X-rays are used in structural analysis and medicine. X-ray images can be used to detect the disease in the early stages and take the necessary measures. But any radiation is safe only in certain doses - it is not for nothing that works in the X-ray room and is considered harmful to health.

Today, in addition to radiography, the following diagnostic methods are used:

- Ultrasound examination (a study that examines our body as an echo of high-frequency sound rays and creates a "map" of it, taking into account all deviations from the norm). Ultrasound is used in the practice of physical, physicochemical and biological research, as well as in medicine - for diagnosis and treatment [9,10].

- Iridology is a method of diagnosing human diseases by examining the iris of the eye.

- radiodiagnosis (based on the use of radioactive isotopes). Thus, radioactive isotopes of iodine are used to diagnose and treat thyroid diseases.

Laser (optical quantum generator) has been widely used in scientific research and applied medicine (surgery, ophthalmology, etc.). Lasers are used in oncology. With their help, they destroy a malignant tumour and perform the most complex operations on the brain. Powerful laser pulses "graft" the exfoliated retina and perform other ophthalmic operations.

Bleeding is an unpleasant obstacle during operations, because. it distorts the view of the surgical field and can cause exsanguination of the body. Miniature generators of high-temperature plasma (plasma scalpel) have been created to assist the surgeon. Cuts tissues and bones without blood. Wounds heal faster after surgery.

Devices that can temporarily replace human organs are widely used in medicine. Currently, medical personnel use heart-lung machines. Cardiopulmonary bypass - temporary stopping of blood circulation of the heart and blood circulation in the body with the help of a heart-lung machine.

Physiotherapy. This is a field of clinical medicine that studies the therapeutic effects of natural and man-made natural factors on the human body.

Medical physicists are directly involved in the process of treatment and diagnosis, combine physical and medical knowledge, and exchange ideas with the doctor responsible for the patient.

## **Conclusions**

Physics is important to medicine, and medicine is important to human health. Therefore, it is necessary for medical students to learn the science of medical physics and to support its development.



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