

## **Modern Innovative Ways to Transfer Information from Teacher to Student when Studying Human Anatomy, Operative Surgery and Topographic Anatomy on Pirogov's Interactive Anatomical Table**

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**Abstract:** The doctor's knowledge of the individual anatomy from the standpoint of the three-dimensional topography of the organ structures of each patient is becoming a leading task on the way to solving the issues of high-quality care provided by modern medical practice. The interactive anatomical atlas of 3D images "Pirogov" allows you to transfer the study of disciplines of anatomical nature to a new mainstream of computational anatomy, or anatomia in silico.

**Keywords:** Interactive anatomical table "Pirogov", innovation, technology, anatomy, morphology.

**The relevance of the topic.** The interactive table "Pirogov" and the digital atlas are used by the Department of Human Anatomy and Operative Surgery and Topographic Anatomy of the Samarkand State Medical Institute during classes with students of all specialties from the new academic year. The complex has proven its effectiveness and usefulness, which is especially needed and important in the current shortage of anatomical material. The table is particularly useful for classes with foreign students, as it is more convenient and effective to explain the material by showing them on a virtual anatomical model than just explaining it. Anatomical structures of the human body, which study the macroscopic and microscopic structure of the human body, is a fundamental discipline in medical universities and contains a vast amount of material that requires organized study and detailed assimilation.

**The purpose of the work.** To create and implement an innovative method in the field of medical teaching and process in the study of the discipline "Human Anatomy" at medical universities. A new educational product is the interactive anatomical table "Pirogov".

**Materials and Methods.** For the purpose of mathematical modeling and creating a three-dimensional (3D) human model, we employed methods from medical introscopy, as well as the use of a 3D scanning device to scan dissected anatomical human structures. Other research methods were also used.

**Figure 1:** *Interactive anatomical table "Pirogov"*



At the present time, we have identified the following potential uses for this educational equipment in relation to the tasks of our department:

- Control of initial knowledge in the fields of normal and topographic anatomy for residents who are studying to the extent required for further training in their speciality.
- Filling in gaps in knowledge in the fields of normal and topographic anatomy that were identified during previous assessments through both group and individual independent study by students.
- Regular use as a practical and demonstration tool in the planned study of specific topics in operative surgery and topographic anatomy.

Clinical anatomy, similar to other clinical specialties, requires a synergistic understanding of certain regions of the human body. These regions involve various organ systems that interact within a living organism in a complex manner during their origin, development, and function, rather than in isolation. Such an understanding of the material under study provides a three-dimensional atlas of anatomy of "Pirogov"

**Figure 2:** *Interactive Anatomical Table "Pirogov" and 3D Human Model.*



The interactive Pirogov anatomical table allows for a detailed study of the anatomical landmarks of a vast array of anatomical structures in both male and female models. We encourage teachers who have not yet begun using the interactive anatomy table to explore its full potential for use, not only in "normal" anatomy, but also in topographic and pathological anatomy, operative surgery, and forensic examinations. With the aid of the Pirogov anatomy table, students are able

to more fully understand the interplay of internal organs in three-dimensional (3D) format, compare them with computed tomography (CT) and magnetic resonance imaging (MRI) sections, and clearly demonstrate the benefits and drawbacks of various surgical approaches. Additionally, students, while independently solving clinical and pathological problems through scene creation, can quickly comprehend, explain, and visualize the development of numerous pathological symptoms and syndromes. The program is saturated with interesting solutions that offer new possibilities. For example, comparing anatomical structures through the use of ultrasound, CT, and MRI data allows for the development of clinical thinking and the practical application of topographic and anatomical knowledge in various clinical fields. The pie chart allows users to view the human body in a unique perspective, from the inside out. In addition to macroscopic structures, users can also observe microscopic details of organ systems.

**Fig. 3:** *Comparison of organs*



Unfortunately, the increasing number of textbooks and atlases on human anatomy is not contributing to improving the quality of students' knowledge in this area. Two-dimensional illustrations often do not provide sufficient volumetric details of the areas being studied. In light of the continually decreasing hourly workload for such fundamental disciplines as human anatomy within medical university curricula, students are being forced to learn a vast and often difficult-to-understand body of educational information within a much shorter period of time.

**Fig. 4** *Organ diagnostics*



The increasing volume of teaching materials, guides, and atlases related to anatomical subjects unfortunately fails to assist in providing rapid and high-quality learning. In fact, the style of presentation often prevents correct understanding of the area or organ under study, and the illustrated material does not accurately depict the location and size of the anatomical structure. The increasing digitization of various aspects of human life, including medicine, has raised the question of incorporating modern learning technologies, computer simulations, and new forms of instruction into the education process. This shift towards digital learning has the potential to revolutionize the way we approach and learn anatomy.

**Therefore**, the Pirogov course enables third-year students of any specialty to quickly and relatively effortlessly master a time-intensive subject such as clinical anatomy and operative surgery, as well as develop clinical thinking, in preparation for their future career. This all allows for successful learning of the subject itself, and develops students' readiness for clinical work.

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