

ИТОГИ РАЗРАБОТКИ И ВНЕДРЕНИЯ СИСТЕМЫ ПЕРСОНАЛИЗИРОВАННОГО МЕДИЦИНСКОГО ОБРАЗОВАНИЯ В ВОЛГОГРАДСКОМ ГОСУДАРСТВЕННОМ МЕДИЦИНСКОМ УНИВЕРСИТЕТЕ

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Персонализация образовательного процесса в медицинском вузе является одним из необходимых условий успешной подготовки профессиональных медицинских кадров.

В статье представлен 7-летний опыт внедрения дисциплины «Курса мануальных навыков и клинической анатомии» на кафедре оперативной хирургии и топографической анатомии Волгоградского государственного медицинского университета и 10-летний опыт студенческого Хирургического Клуба ВолГМУ, в работу которого внедрена персонализированная система образования будущих хирургов.

Доказана целесообразность дисциплины «Курса мануальных навыков и клинической анатомии» в медицинском вузе, как составляющей части персонализированного медицинского образования. В настоящее время данная дисциплина внедрена в 27 медицинских вузах России. Итоги работы Хирургического Клуба ВолГМУ, как прообраза инновационного студенческого медицинского профессионального сообщества, продемонстрировали успешные результаты предложенной системы персонализированного медицинского образования на этапе обучения в вузе, постдипломного обучения и в профессиональной деятельности врача.

Ключевые слова: персонализация, персонализированное медицинское образование, курс мануальных навыков, клиническая анатомия, студенческий хирургический клуб, олимпийское движение по хирургии.

MEDICAL EDUCATION PERSONALIZED SYSTEM DEVELOPMENT AND IMPLEMENTATION RESULTS AT VOLGOGRAD STATE MEDICAL UNIVERSITY

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Personalization of the educational process in a medical university is one of the necessary conditions for the professional medical personnel successful training.

The article presents 7 years of experience in the discipline «Manual Skills and Clinical Anatomy Course» teaching at the Department of Operative Surgery and Topographic Anatomy of the Volgograd State Medical University and 10 years of experience at the students' Surgery Club of the Volgograd State Medical University, which applied a personalized education system for future surgeons.

The expediency of the discipline «Manual Skills and Clinical Anatomy» at a medical university, as part of a personalized medical education, has been proved. Currently, this discipline has been introduced in 27 medical universities of Russia. The results of the Surgical Club of Volgograd State Medical University, as a prototype of an innovative student medical professional community, demonstrated the successful results of the proposed system of personalized medical education at the stage of education at a university, postgraduate education and in the professional work of a surgeon.

Key words: personalization, personalized medical education, manual skills course, clinical anatomy, students' surgical club, Olympic surgery movement.

Personalization of the educational process in a medical university is one of the necessary conditions for the professional medical personnel successful training [2].

The student's ability to choose independently a future medical specialty, the accessible educational material base and pedagogical resources availability to obtain the appropriate skills in the chosen profession, an individual approach to training, are the success factors for becoming a medical student as a competent professional doctor.

The process of professional self-determination is individual and depends on the psychophysiological characteristics of the individual, the motivation level, professional interests and preferences of students – future specialists. The task of higher education is to promote student awareness as a professional, taking into account personal characteristics, motives, prerequisites and interests; contribute to the professional development planning both at the stage of study at the university, and in professional activities; to form the understanding of the need to develop professional and personal competencies during the whole professional career.

The significance of the personalized medical education system development and implementation was due to several reasons [3].

First, the general educational program is not always able to satisfy all the students' individual characteristics and their interests. There is always a students' distribution according to their degree of interest and academic achievement in obtaining professional education at the university. Three students groups can be distinguished here.

Group 1. «Gold» Students with a high degree of motivation to acquire knowledge and practical professional skills. Such students are interested in gaining knowledge, demonstrate mainly «excellent» results, and are actively involved in research and practical activities. They are capable of mastering knowledge beyond the curriculum. These students independently form the paradigm of learning and do not succumb to the majority opinion.

Group 2. «Silver» Students with a slightly pronounced motivation – stably having «good» learning results and, in some cases, attending scientific clubs in departments, often guided by the opinions of the greater mass of students surrounding them.

Group 3. «Bronze» Students with low or no motivation, having mediocre learning results, who lack interest in scientific-research activity and practice.

The formation of their training paradigm occurs spontaneously, according to the principle of «how will it turn out». From year to year, group 3 shows a steady increase in «gray mass» due to a significant decrease in groups 2 and 3.

The second factor that necessitated the personalized system development and implementation for improving knowledge was the students' loss of basic and secondary guidelines, often through the use of professional standards. If earlier the process of transferring knowledge, especially manual skills, was from generation to generation, then due to the rapid development of training information forms, this individualized approach was undeservedly forgotten.

In order to increase the number of students with a high degree of motivation for obtaining knowledge and practical professional skills and their support, the **system of personalized medical education** was developed and applied at the Volgograd State Medical Institute. This program is primarily focused on the knowledge and practical manual skills individual transfer, direct and long-term contact between the student and the teacher.

The personalized medical education system development at the Volgograd State Medical University began in 2013 with the discipline «Manual Skills with the Basics of Clinical Anatomy» implementation into the educational process at the 2nd year-studying at the Medical and Pediatric Faculties at the basis of the Department of Operative Surgery and Topographic Anatomy [6, 11]. It must be said that this was first used in the medical education of our country. The initiator was the head of the Department of Operative Surgery and Topographic Anatomy, Honored Scientist of the Russian Federation, President of the All-Russian Association of Clinical Anatomists, Professor A.A. Vorobyev. Almost synchronously, this course was introduced into the educational process of the Moscow State Medical University named after I.M. Sechenov (prof. S.S. Dydykin). The expediency and effectiveness of this discipline in medical education was undeniably obvious. Nowadays, this discipline is taught in 27 medical universities in Russia [7].

In 2015, to provide the discipline «Manual skills course with the basics of clinical anatomy» with educational and methodological literature, a team of authors from leading clinical anatomists and heads of Departments of Operative Surgery and Topographic Anatomy of the Medical universities in our country edited by Professor A.A. Vorobyev and Professor I.I. Kagan, released a training book on manual skills

«Surgery» [9]. In 2016, this training book received the annual award in the field of medical and pharmaceutical education «Docento dicimus» in the nomination «For the best practice of educational programs training and methodological support». In manual skills development classes, students under the guidance of a teacher were able to independently perform the basic surgical techniques of the vascular, intestinal, tendon suture on the biological material of animals and humans, intubate the trachea, apply a tracheostomy, perform punctures of large joints, pleural cavities and other manipulations on surgical simulators. Practical exercises in manual skills and clinical anatomy helped many students to navigate their choice of future medical specialty [10]. Students got a motivation to continue improving and developing in surgical disciplines. The teachers had the opportunity to highlight such students and support them. Students motivated by surgery were able to continue their studies outside the classroom at the students' Surgical Club of the Volgograd State Medical University [13].

Students' Surgical Club of the Volgograd State Medical University exists since 2009. It was organized on the basis of the scientific surgical club of the Department of Operative Surgery and Topographic Anatomy. The change in the status has occurred since the participation of the Volgograd State Medical University students in the All-Russian Student Olympic Movement [4, 8].

For the first time, the student Olympic team of the Volgograd State Medical University took part in the 19th All-Russian Student Olympiad in Surgery in spring, 2010 in the regional tour in Samara and in the final round in Moscow. The formation of the team required enhanced theoretical training, the development of manual skills in surgery, traumatology, endovideosurgery, neurosurgery, resuscitation. For Olympic students, the specialized professionals of the university held master classes, and individual preparation was for each team member for the Olympics. Such a personal approach to each student of the national team gave the result. Already in 2011, the Volgograd State Medical University team became the Olympic third place medalist of the anniversary XXth All-Russian Student Surgery Olympiad in Moscow.

Since the organization of the Surgical Club of the Volgograd State Medical University, participating in the Olympic movement, the Olympic student surgery team has repeatedly become the winner and prize winner of All-Russian and regional Olympiads, surgical interuniversity sparring.

The benchmark for the development of qualified professional manual surgical skills directly from specialist surgeons, the acquisition of a theoretical training high level, significantly changed and increased the status of students trained in the Club and the Surgical Club itself. The students at the Volgograd State Medical University consider the Surgical Club prestigious and priority.

Today, the goal of the Surgical Club of the Volgograd State Medical University is the formation of professional competencies in the surgical profile for students of the medical university, taking into account their individual interests in the chosen specialty.

The basic principles of the Club are direct and affordable contact with a high-level specialist, high-quality knowledge, the possibility and accessibility of working out acquired students' skills to the level of expertise.

During the 10 years of the Club's existence, experience was gained in the personal training of surgical students.

7-years of teaching experience at the Department of Operative Surgery and Topographic Anatomy and 10 years of experience at the Surgical Club of the Volgograd State Medical University allowed the formation of a **personalized medical education system** and its successful use in the work of the surgical student club of the Volgograd State Medical University:

1. **Mandatory basic level of manual skills in surgery development and gradual build-up of the skill.**
2. **Organization of the Club in a certain structure with partial student self-government.**
3. **The forms of the Club's work.**
4. **The Club's material base.**
5. **The system of students' selection during the selection for the Surgical Club (exam) and at different stages of training in the Club (intra-university Olympiad).**
6. **A multi-level mentoring system.**
7. **Competitive principle (healthy competition).**
8. **The ability to choose the surgical section of the Club for classes and the development of manual skills in the chosen specialty.**
9. **The system of students' stimulation and encouragement.**

Mandatory basic level of manual skills in surgery development and gradual build-up of the skill.

Mastering the required basic level of surgical manual skills begins within the 2nd year-studying on the discipline «Manual skills course with the basics of clinical anatomy». They are required for entrance exams to the Surgical Club of the Volgograd State Medical University. Students must learn to tie surgical knots, use surgical instruments, master the theory and technique of skin, intestinal, vascular, tendon sutures, nerve and liver sutures, tracheostomy on biological material and prostheses. They need master general medical and surgical procedures: stop bleeding, puncture, catheterization, blockade, primary immobilization of fractures, intubation of the trachea, reduction of dislocation of the upper and lower extremities, palpation of peripheral arteries, rectum, placement of probes, cardiopulmonary resuscitation on the simulator. For classes in the system of personalized medical

education, the students should already have knowledge of systemic and clinical anatomy, therefore no earlier than the second year students will be included in this system.

The same basic techniques continue to be mastered by students as the part of the Surgical Club of the Volgograd State Medical University with deepening and expansion at master classes and within the independent work. The club members currently perform operations such as entero-enteroanastomosis, gastro-enteroanastomosis, transverse-enteroanastomosis, various types of bilodegative anastomoses, transanal rectal resection with anastomosis, bladder plastic surgery, enterourerostomy, aorto-rhinoplasty shunt procedures, seam and nerve plastic, osteosynthesis, skin grafting, heart and aortic valve surgery with prosthetics, microvascular surgery with optics, craniotomy, endoscopic intracorporeal suture, laparoscopic appendectomy on the simulant, laparoscopic surgery on the intestines, kidneys, endoscopic polypectomy of the stomach, laparoscopic resection of the ovarian cyst, myomectomy, amputation of the uterus with appendages, plastic of trachea, liver, kidney, heart and lung transplantation [1].

Organization of the Club in a certain structure with partial student self-government.

Every year, in an average of 65 to 80 2nd–6th year students of medical and pediatric faculties are studying in the Club. Joining the Club takes place through the special exams in September. The President of the Club is a student who is elected by general vote. The work of the Club is carried out according to the curriculum, but mainly in the evening, free from classes and the educational process at the Department. The teachers of the Department work with students at extracurricular time. Surgical specialists are invited to the master classes: the Volgograd State Medical University employees and medical practitioners, surgical specialists. The relatively small and stable number of students allows teachers of the medical university work individually, transfer skills directly, share knowledge and experience with almost every student who is passionate about the surgical specialty.

The forms of the Club's work.

The forms of work with students are: club meetings, master classes with specialists in surgery, independent work of students in the experimental operating department and in the section on biological material, work on simulators, older students and clinical graduates of the Club guidance tutoring, the annual intra-university Olympiad, participation in All-Russian and regional Olympiads, interuniversity sparring in surgery, elective sparring partnership with foreign students, active participation in working with the young medic school, participation in the contest «Best Student of the Year» on the subject of operative surgery and topographic anatomy; official trips to the country's training centers; a visit to training bases

on manual skills of medical universities participating in the Olympic movement; manual skills contests. The Club students are also engaged in scientific work at the Department, speak at scientific student conferences of the university, other medical universities in Russia and abroad, participate in grants, have printed works and Patents for invention. Such a number of existing forms of training at the Club allows the student to choose a personal form for his development [1, 5, 8, 13, 14].

The Club's material base.

At the Department of Operative Surgery and Topographic Anatomy, there is an equipped experimental operating room, endovideosurgical stand and toolbox, microoptics, microsurgical instruments, training devices, and simulators. Surgical instruments, models for surgical suturing, the «Ethicon» simulator for developing the skills of surgical nodes. Simulators for intubation of the trachea, drainage of the pleural cavity, tracheostomy, catheterization of the bladder, venipuncture, for the study of the rectum with nozzles. Biological material: skin, tendons, liver, heart, blood vessels, intestines. The Department has thematic x-rays, CT and MRI data. The Department material base, communication with other departments of the university, within the framework of the Club and the preparation of the Olympic team, allows the Club members not only to get acquainted with basic skills, but also to work with professional equipment and tools, to try and master high-tech specialties and operations, to individually pick a case to their liking, receive directly from surgeons of the highest category, professors, candidates and doctors of science the most modern and advanced technologies experience.

The system of students' selection during the selection for the Surgical Club (exam) and at different stages of training in the Club (intra-university Olympiad).

Admission to the Surgical Club is carried out annually in September. Students entering the Club must pass preliminary master classes in surgical pigtail and surgical stitches and pass the entrance exams, which are determined by the student-members of the Club. They themselves take exams. Such a system eliminates «random» members in the Club.

To date, the rules for admission to the Surgical Club of the Volgograd State Medical University in 2019 are as follows:

Stage 1 – Tie a surgical pigtail. The standard is 5 cm in 30 seconds. Those who did not pass this stage are not allowed to the next one.

Stage 2 – Test for knowledge of anatomy and general surgery. Passing score is 18 correct points out of 20 questions.

Stage 3 – Oral answer to 2 questions from general surgery. The applicant is considered to answer correctly to both questions. Preliminary questions are not published.

Stage 4 – Knowledge of 18 basic tools. The applicant is considered to describe all the tools presented.

Stage 5 – Interview with the Club President. This stage does not affect the entry and does not contain questions on knowledge. It is for acquaintance with those who passed all the stages.

A member of a club is a person who has successfully completed all stages.

A multi-level mentoring system.

In the Surgical Club, there is a continuous transfer of knowledge and skills at different levels. It looks like this:

1. Group with primary training. First-year students assist the student tutors who have been members of the club for more than a year. The tutors-clinical residents (graduates from the Club) help all the members of the Club.

2. Mid-level group to work with a teacher. Student-teacher.

3. The highest level. Special group. Work with a specialist mentor. Student-Profile Specialist.

A personalized, individual approach to surgical skills development at the Surgical Club for 10 years has allowed to formulate the principle of continuity, which began from top to bottom: from the teacher and specialist surgeon to the student. Further, the experience gained is transferred from the older students and clinical residents (graduates) to younger students. As the part of the Club development, new practical experience in manual skills is transmitted directly to the Club members from highly qualified surgeons of the university and practical healthcare directly at the master classes. Further, the students independently work out the acquired skills and knowledge, have a connection with the master and the club managers. Over 10 years, the Club graduates have become top-level specialists, candidates of sciences, heads of surgical departments and are very pleased to teach master classes for the Club, they are members of the Olympiads jury.

Competitive principle (healthy competition).

In fact, this principle allowed the formation of the Surgical Club. Students annually participate in Olympiads of various levels: intra-university, regional tour of the Southern Federal District, All-Russian, surgical sparring, competitions, surgical games [8]. Competitions train healthy competition and excitement among the students, which gives energy and potential for promoting oneself as a specialist, expands interest in the profession, sets new challenges for achievement. At competitions in other cities, students are acquainted with other training facilities, centers of manual skills, specialists and students, which helps in the future to build their professional activities, to expand communication among colleagues.

The ability to choose the surgical section of the Club for classes and the development of manual skills in the chosen specialty.

The Club has sections: cardiovascular surgery, neurosurgery, microsurgery, urology, abdominal surgery, coloproctology, thoracic surgery, gynecology, ophthalmology, cardiopulmonary resuscitation, endovascular surgery section, the point man on the section is responsible for their work. The wide range of surgical specialties presented in the Club allows pick a case to the students' liking and improve in it. This fact directly reflects the personalized approach of the student education system at the Surgical Club.

The system of students' stimulation and encouragement.

The very fact of obtaining highly qualified professional skills, personal contact with high-level specialists, the opportunity to demonstrate their success at the master-classes, the Olympics are already stimulating factors for the Club members. Active members of the Club are awarded with certificates, letters of acknowledgment from the Rector, they are presented with permits to the sports and recreation camps, medical student internship abroad [12]. Letters of acknowledgment are sent to the relatives of the students who won the Olympiads. According to the results of work, the number of letters received, the Club members receive extra points for admission to the clinical residency. The Club students' active participation in the life of the institute demonstrates them among the employers, they have priority for entering work at the medical university, and practical healthcare.

The results of the system of personalized medical education tested at the Surgical Club of the Volgograd State Medical University include the following:

- The students involved in the Surgical Club academic rating is on average 90–92 %, and it grows among students from the moment they join the club until the graduation.

- The average score for exams in the discipline «Operative surgery and topographic anatomy» is 4.6–4.8.

- The Club's Olympic battles include annual victories at the All-Russian and regional intra-university Olympiads, surgical sparring, and surgical contests. The Club members are also in demand at other Olympiads in other disciplines, where they win prize places.

- The members of the Surgical Club, while already studying at the university, have printed works, successful speeches at scientific and practical conferences in Russia and abroad, Patents for inventions.

- 100 % admission of Club members to clinical residency after the graduation, as graduates of the Club have an excellent specialized professional theoretical and practical training in surgical specialties, trained courage and will.

- Excellent reviews about the graduates of the Club-Clinical Residents from their leaders, employment in a good work-place after the graduation from

clinical residency, as the Club graduates already independently perform operations on a par with practical doctors already in clinical residency, have trust from managers.

• 48 Club graduates are working as doctors not only in Volgograd in practical healthcare, the Volgograd State Medical University, but in other cities of Russia and abroad, specializing in surgery, oncology, transplantology, cardiovascular surgery, traumatology, pediatric surgery, urology, gynecology, ophthalmology, ENT, neurosurgery, intensive care, plastic surgery, endovideosurgery. Among the graduates, there are already candidates of medical sciences, heads of the surgical departments. The graduates always keep in touch with alumnus, which develops and supports the generation continuity, support and collective spirit in the professional medical community.

The developed system of personalized medical education at the Volgograd State Medical University has proved its viability and effectiveness during the 7-year experience of the discipline «Manual Skills Course with the Basics of Clinical Anatomy» teaching and 10-year experience of the students' Surgery Club work at the Volgograd State Medical University.

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