EXPERIENCE AND WORK OF ORGANIZATION OF SIMULATION TRAINING OF ANESTHESIOLOGISTS AND INTENSIVE CARE SPECIALISTS

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The article considers the relevance of simulation training in the practical training of anesthesiologists and intensive care specialists. The theoretical and practical prerequisites for the inclusion of simulation education in the trajectory of the educational process in order to reduce the number of medical errors in one of the most high-tech specialties of modern medicine are substantiated. The experience of stage-by-stage simulation training of anesthesiologists and intensive care specialists in the simulation center of the ASMI is presented.

Keywords: Simulation training, anesthesiologist-resuscitator, practical skill.

ОПЫТ И НАРАБОТКИ ПО СИМУЛЯЦИОННОМУ ОБУЧЕНИЮ АНЕСТЕЗИОЛОГОВ И ВРАЧЕЙ СКОРОЙ МЕДИЦИНСКОЙ ПОМОЩИ АНДИЖАНСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ ИНСТИТУТ

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В статье описывается актуальность применения симуляционных технологий в рамках практической подготовки анестезиологов и врачей скорой медицинской помощи. Он подтверждает теоретические и практические основы для включения в обучение технологий, основанных на моделировании, с целью уменьшения количества медицинских ошибок в одной из самых высокотехнологичных областей современной медицины. Авторы делятся опытом поэтапного симуляционного обучения анестезиологов и врачей скорой медицинской помощи в симуляционном центре АГМИ.

Ключевые слова: симуляционное обучение, анестезиолог и реаниматолог скорой помощи, практические навыки.

Currently, the requirements for the professional activity of doctors have increased immeasurably compared with the events of 20 years ago. A doctor who does not possess practical skills at a sufficient level cannot be admitted to professional activity. Modern practice of continuing medical education to a certain extent allows us to solve this problem.

Nevertheless, to create a high-reliability system in the work of a doctor, it is important not only to constantly improve the level of theoretical knowledge, but also to teach him how to correctly and safely perform technically complex actions strictly in accordance with treatment protocols. Among the medical specialties, anesthesiology-intensive care is one of the most science-intensive [2]. In this section of clinical medicine, there is a constant accumulation of the volume of scientific information used, the steady introduction of modern high-tech diagnostic and therapeutic techniques into practice. These circumstances, in turn, create the danger of the doctor making professional mistakes, which often cause death in the patient. In the USA, a careful analysis of mortality has concluded that medical errors account for a significant part of the causes of death of patients, reaching 50-100 thousand cases annually [3]. According to various authors, similar results have been obtained in Europe. In particular, in the UK – 70 thousand, in Germany–100 thousand, in Italy – about 90 thousand patients [4,6,7,14]. A medical error is interpreted as a manifestation of a "human" factor or a "system failure". During the professional training of doctors, it is necessary to take into account the psychological aspects of the activities of anesthesiologists-resuscitators. With all the alertness and readiness for the worst case scenario, the anesthesiologist-resuscitator constantly risks encountering an unplanned situation. "Hours of boredom and moments of horror" [8] is a formulation that vividly characterizes the nature of the work and to some extent explains the reasons for professional deviations of anesthesiologists. In critical situations, the doctor does not work alone, but in a team and within a complexly organized system. Doctors who have "learned from their mistakes" are replaced by those who still have all the difficulties ahead. A new stress factor is being formed – the fear of mistakes, the fear of being involved in a lawsuit with an unfavorable outcome for the patient. The overall level of conflict has increased significantly in conditions where it is necessary to share responsibility within the team for the health and life of patients. All this requires qualitatively new approaches to the training of anesthesiologists and resuscitators for professional activity. One of such approaches in modern conditions is simulation training (CO), especially since, due to the specific features of the specialty, mastering practical skills in providing intensive care in the clinic is impossible and feasible only on mannequins. Simulation training is a method of active learning aimed at developing knowledge, skills, and social attitudes [9]. It helps to increase the intellectual potential of the student, activate his ability to learn, and master specific skills types of production activities, the formation of adequate forms of communication in the process of this activity with work colleagues and secondary medical personnel. The most important advantages of CO–learning practical skills without causing physical and psychological harm to the patient, as well as an objective assessment of the quality of professional training by every specialist. The classical education system used until recently provides for the

development of clearly regulated academic disciplines and subjects. This does not provide the necessary level of motivation for cadets and their conscious activity in the implementation of the learning process. In the simulation version of professional training, their active cognitive and emotional involvement in the educational process takes place. This allows them to significantly increase the level of necessary knowledge of the theory of the issue acquired by them, as well as practical skills in the conditions of completeness and realism of the simulated clinical situation [1, 10, 11, 15]. It allows you to teach specialists how to work in accordance with modern standards and protocols for emergency care, develop team interaction skills in a team of doctors and secondary medical workers, improve the quality of performing complex medical procedures and objectively evaluate the result of activities. To do this, it is necessary to master a solid theoretical knowledge base of pathophysiology, clinic and diagnosis of critical conditions, knowledge of modern principles of their treatment, impeccable implementation of emergency care and resuscitation technologies on simulation dummies and the ability to work in a team [13]. In connection with the above, 4 main tasks have been identified with:

1) ensuring a qualified level of mastering practical professional skills of emergency intensive care in critical conditions on special simulators;
2) training of a professionally trained doctor who is able and willing to apply his knowledge and practical skills in various critical situations;
3) control of the effectiveness and quality of resuscitation measures;
4) study and implementation of modern methods of improving the quality of his medical activity in the practice of an anesthesiologist-resuscitator, assessment of their compliance with professional standards and protocols.

As the stages of training and the testing process, we use modified proposals by I. Z. Yalonetsky et al. [5]. The training is conducted in three stages.

1. Theoretical remote stage. The study of the theoretical foundations of practical skills is conducted remotely using educational materials posted on the Moodle platform.
2. Practical remote stage. Visual automatisms of practical skills are practiced on the Moodle platform by watching videos (cardiopulmonary resuscitation, "difficult airway", intraosseous access, conicotomy, catheterization central veins, epidural and subarachnoid anesthesia, etc.). Pharmacokinetic aspects of anesthesia are mastered using the Gas Man simulator. The stage ends with intermediate testing on the Moodle platform.

3. Simulation communication stage. Practical skills training is carried out in the simulation center using mannequins, simulators, tools and consumables.

Students who have not mastered the previous stage of practical training cannot be admitted to the next stage. Practical skills training is conducted in accordance with the recommendations of the European Council for Intensive Care (ERC), which we use in all types of training. ERC recommends mastering practical skills using simulators and simulators in the form of a 4-step method:

Stage 1 – the teacher for all students of the group shows in real time on the simulator how a particular skill is performed correctly;

Stage 2 – the teacher shows and explains all the elements of the skill and answers questions;

Stage 3 - the student tells the teacher how to perform the skill, and the teacher executes his instructions on the simulator, even if the student gives incorrect instructions. At this stage, the student must see possible mistakes and correct them himself;

Stage 4 – the student performs the skill independently and comments on its implementation. This allows you to better remember the totality of the constituent elements of the skill.

In addition, in some cases, the "self–taught - teach a colleague" technique is used. With the help of scenarios prepared on the basis of real clinical cases, a clinical environment with a high level of reliability is created: an intensive care unit or an operating room, modern technical equipment, and compliance of the simulator's level of operation with the clinical task. All manipulations are fully simulated (ampoule opening, infusion therapy, intraosseous access, "difficult airway" algorithm, cardiopulmonary resuscitation, conicotomy, central vein catheterization, epidural and subarachnoid anesthesia, etc.). In a critical situation, the doctor's attention is focused on the patient. Nevertheless, it is important to take into account various aspects of the work, including proper documentation of the crisis situation. In terms of clinical modeling, the administrative structure of a medical organization is taken into account. The simulated system of responsibilities and professional relationships is identical to that in practical healthcare. This also applies to the documentation regulating the work of specialists and used by doctors and nurses in the process of simulation training (anesthesia charts, appointment sheets, blood transfusion protocols, etc.). Classes in the simulation center are conducted in small groups. The instructor–cadet ratio is used for training (from 1 : 2 to 1 : 4). When using carefully designed scenarios, the work can be carried out by a team without the participation of a teacher-instructor as part of self-study in the presence of auxiliary technical personnel (software technicians). A sufficient staff of instructors allows you to solve many tasks in a short period of time – the acquisition of new skills before combining various specialists to resolve a crisis situation, when everyone performs their actions, successfully cooperating with team members. During the simulation work, students should independently see the problems that arise, assume a scenario for the development of the situation, find solutions, and set new goals with a change in the clinical situation. The functions of the coordinator in these conditions can be performed by a member of the student's team. The instructor adheres to the principle of "extraterritoriality" and conducts remote monitoring from a separate room. Immediately upon completion of the scenario, a detailed discussion of the clinical situation is conducted, while each student analyzes his actions. In the working conditions of specialists of various specialties (obstetricians, anesthesiologists, intensive care specialists, neonatologists), their interaction is evaluated [14, 16]. The result is a discussion of the problems of clinical practice, identification and correction of the weaknesses of practical training [17]. The certification of students is carried out by the teacher responsible for their training for each practical skill being studied. The test is considered to have been passed successfully and a "Credited" grade is

given for this skill if the student completed it with a score of 70% or more. During the certification performance of the practical The teacher cannot ask questions or comment on the actions of the examinee. The exceptions are those cases when the student has made a gross mistake, which excludes the possibility of performing the skill correctly. In this case, the certification for this skill is terminated and the attested person is given a non-credit score. At the same time, the student is not deprived of the opportunity to be certified in other practical skills, if this is provided for by the certification program. Unreleased practical skills are subject to re-certification after additional training. Every year, about 100 anesthesiologists and intensive care specialists are trained at the department within the framework of certification cycles. Testing of students in the simulation center is part of the certification exam. Thus, the accumulated experience has shown that CO allows to improve the quality of professional training of anesthesiologists and resuscitators, including by increasing the motivation of cadets in achieving the final result of training. The introduction of CO to provide medical care to patients in critical condition makes it possible not only to objectively assess the initial level of professional training of doctors, but also its dynamics in the learning process, thereby determining the quality of the organization of the educational process at the department. The expected result of the transition to this practice-oriented training system is a significant reduction in the risk of professional errors caused by the human factor and an increase in patient safety. One of the tasks of the near future is the need for an objective assessment of the role of simulation education in improving the quality of resuscitation care in the clinic.

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