

THE DEVELOPMENT OF SIMULATION-BASED TRAINING AND ACCREDITED EMERGENCY MEDICAL CARE PROGRAMS: THE EXPERIENCE OF THE “TRAVELING DOCTORS” ORGANIZATION IN THE REPUBLIC OF ARMENIA

Barkhudaryan A. S., Yagdzhyan G. V., Simonyan A., Chekidzhyan Sh. A.

NPO “Traveling Doctors,” Yerevan, Republic of Armenia

arm.barkhudaryan@gmail.com

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Abstract. Since 2020, the “Traveling Doctors” (TD) organization has been implementing projects to develop simulation-based training and enhance the professional skills of medical personnel in the Republic of Armenia. Over the course of six years, more than 4,000 people have participated in the training programs and workshops, including physicians of various specialties, nursing staff, and participants without medical training.

Academic discipline: 3.2.3. Public Health and Health Care Organization, Sociology, and History of Medicine.

Relevance

The Republic of Armenia is implementing a large-scale reform of the medical professional licensing system aimed at improving the quality of medical care, ensuring patient safety, and enhancing the practical training of healthcare personnel. Concurrently, a system of continuing medical education (CME) is being developed, which provides for regular validation of competencies.

Emergency care skills play a particularly important role in the training of healthcare professionals: cardiopulmonary resuscitation (CPR), early recognition of cardiac arrest, performing chest compressions, and using an automated external defibrillator (AED).

Starting in 2025, the Republic of Armenia will include a 12-hour mandatory course titled “First Aid in Emergency Situations” in the list of required CME trainings, awarding 12 CME credits. The program is designed for senior and mid-level medical staff. At the same time, an individual licensing system is being implemented: starting in 2025, first-year clinical residents will be required to obtain a transitional individual license, which requires passing a centralized exam — a written test and a simulation exam on emergency care using modern manikins.

At the same time, approximately 50 automated external defibrillators (AEDs) have been installed in the infrastructure of Yerevan’s small emergency center, integrated with the unified digital emergency medical services system (via specialized mobile apps for volunteers, such as GoodSAM). When a call regarding cardiac arrest is received, the emergency dispatch operator simultaneously sends a signal to nearby trained volunteers, who can quickly retrieve a defibrillator and provide assistance before medical personnel arrive. With the introduction of defibrillators in urban settings, training in the use of automated external defibrillators (AEDs) and the integration of practical simulation training with the city’s digital emergency response ecosystem have become critically important.

Objective

To assess the importance of training in basic resuscitation procedures in the context of licensing reform and the

National Medical Organization (NMO) in the Republic of Armenia. To determine the contribution of educational courses offered by the NGO TD to the development of practitioners’ practical competencies and to the support of out-of-hospital resuscitation programs using community-based resuscitation teams.

Materials and Methods

An analysis was conducted of the Republic of Armenia’s regulatory and legal documents governing licensing and continuing medical education (CME), as well as a review of educational programs implemented by TD. Additionally, modern international approaches to CPR training and the use of automated external defibrillators (AEDs) in public places were analyzed. The organization’s activities focus on two key areas:

1. Accredited educational courses in emergency medical care: First Aid; Advanced CPR; In-hospital Trauma Care; Prehospital Trauma Care. The program content is updated every 5 years as international medical protocols are revised.
2. Establishment of a simulation laboratory and administration of certification exams. Based at the S.H. Avdalbekyan National Institute of Public Health, the organization designed and built a state-of-the-art simulation laboratory, which is used for the objective assessment of practical skills. The center organizes exams for first-year residents, which must be passed to obtain a provisional individual license and admission to clinical practice. Thanks to the training programs conducted, specialists — including medical personnel from regions across the Republic of Armenia, whose training is carried out in active cooperation with the Armenia Aid Foundation — and other trainees acquire the skills necessary to effectively participate in resuscitation efforts, including when using public AEDs.

Results

Since 2020, more than 4,000 people, including physicians of various specialties and nursing staff, have completed certified simulation training in accordance with international standards.

A 12-hour course titled “First Aid in Emergency Situations” has been developed and implemented; it provides participants with 12 CME credits and fully meets the mandatory legal requirements of the Republic of Armenia, which will take effect in 2025.

A modern simulation laboratory has been established and equipped at the S. H. Avdalbekyan National Institute of Public Health (NIPH of the Republic of Armenia). The laboratory hosts objective written and practical exams using manikins for first-year residents, which are required to obtain a transitional individual license.

Discussion

The introduction of mandatory first aid courses and a transitional license for residents marks a shift in the direction of medical training in Armenia from a theoretical assessment of knowledge to a competency-based approach. The experience of “Traveling Doctors” shows that the use of highly realistic simulation equipment makes it possible to standardize the assessment of practical skills and re-

duce the risk of errors during real-world interventions. The development of the urban AED network in Yerevan highlights the need to align educational programs with infrastructure changes. Without widespread training of healthcare workers and potential volunteers, the presence of defibrillators in public places does not yield the maximum clinical benefit.

Conclusions

CPR and AED skills are a fundamental component of training for healthcare professionals at all levels.

Establishing mandatory first aid training, worth 12 CME credits, creates a regulatory framework for the systematic updating of the qualifications of doctors and nurses in Armenia.

The development of a network of publicly accessible AEDs in Yerevan and its integration with the emergency medical services require the mass training of professionals and volunteers capable of properly using a defibrillator in a critical situation.

The establishment of a simulation laboratory at the RA National Institute of Health and the introduction of objective examination standards ensure the transition to a competency-based approach within the framework of the new individual licensing system and help establish a modern emergency response system in the Republic of Armenia.

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THE USE OF THE KOS-SIM VIRTUAL SIMULATOR IN THE EDUCATIONAL PROCESS OF THE DEPARTMENTS OF PLASTIC SURGERY AND DERMATOLOGY IN A COSMETOLOGY COURSE

Gubanova E. I.¹, Ivanov A. A.²

¹ Medical Institute of Continuing Education, "Russian Biotechnology University (ROSBIOTECH)," Moscow, Russian Federation

² Technoesthetics LLC, Moscow, Russian Federation
alexdoc@list.ru

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Abstract. A pilot study was conducted using the "Kos-Sim" virtual simulator to develop practical skills in botulinum toxin therapy and contouring procedures among 40 residents. The study evaluated injection accuracy, alignment with the anatomical layer, and the depth and volume of drug administration. The eight-hour training session demonstrated the simulator's high level of realism and its ability to provide objective assessment of manual skills. The results confirm the potential of "Kos-Sim" for training specialists in cosmetology and plastic surgery.

Scientific specialty: 3.2.3. Public Health and Health Care Organization, Sociology, and History of Medicine.

Relevance

The market for simulation equipment for medical education is experiencing rapid growth and is estimated at approximately \$3.2–3.5 billion (Polaris Market Research, Grand View Research).

Demand for training in the fields of "Cosmetology" and "Plastic Surgery" in the Russian Federation is growing significantly, at a rate of about 15% per year.

Objective

1. To evaluate the capabilities of the new Kos-Sim virtual simulator within the training program for residents in the specialties of "Dermatology," "Cosmetology," and "Plastic Surgery."
2. To evaluate the simulator's capabilities for developing practical skills in botulinum toxin therapy and contouring procedures.
3. To develop recommendations for incorporating practical training on the Kos-Sim simulator into the curriculum of relevant departments at medical universities.

Materials and Methods

The Kos-Sim simulator is a portable device featuring a silicone model of a woman's head, a large touchscreen for control and information display, a set of training instruments (syringes for botulinum toxin therapy and contouring), an atlas of clinical facial anatomy, and a navigation system with software.

The simulator allows for the complete elimination of live models from the training process for residents and enables the development of consistent skills in the precise and safe injection of botulinum toxin and fillers into the correct anatomical layer.

The authors conducted a pilot study of the Kos-Sim simulator involving 40 residents from the Department of Dermatology and Venereology enrolled in the cosmetology program at the Medical Institute of Continuing Education of the Federal State Budgetary Educational Institution of Higher Education "Russian Biotechnology University."

In the second stage, residents evaluated the simulator's capabilities for injecting botulinum toxin into various areas in training mode. This mode displays prompts regarding the injection depth in mm, anatomy (name of the anatomical layer), and the amount of the drug administered (units, U, and mL). The botulinum toxin therapy module included 12 injection options for various areas of the face and neck. The assessment focused on the accuracy of targeting the muscle layer and the amount of toxin administered per injection site and per anatomical treatment area. The information was displayed on the screen as the exact amount of the drug administered, converted to Units and mL.

In the third stage, the simulator's capabilities were evaluated during a facial contouring procedure. The simulator features 12 types of procedures — needle techniques for injecting fillers into various anatomical areas of the face. The assessment focused on the accuracy of targeting the correct layer (e.g., superficial or deep fat, the gliding space) as well as the volume of filler injected in milliliters. After self-directed training and reviewing the instructions, the final stage was a training exam in which no hints were provided, a timer was activated, and an audio-video recording was automatically made of the simulator screen and the built-in external webcam. This mode is typically used during the accreditation of specialists at accreditation and simulation centers.

Results

During the testing of the Kos-Sim virtual simulator by residents of the Department of Dermatology and