

TRAINING IN THE MEDICAL SIMULATION UNIT AT THE UNIVERSITY MEDICAL CENTRE, LJUBLJANA, DURING SPECIALISATION

SIMULACIJSKO UČENJE V MEDICINSKEM SIMULACIJSKEM CENTRU V UNIVERZITETNEM KLINIČNEM CENTRU V LJUBLJANI

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Letter to the Editor

1 WHY TRAIN IN SIMULATION CENTRES?

Patient safety has become the main focus during training and maintaining the mastery of skills. Simulation-based training to increase safety started in pilot training and it has also been introduced where there is high probability of catastrophic events. The mortality rate is one death per 200,000 anaesthesias administered. Two thirds of these deaths are due to human errors and up to one third is due to technical faults (1,2). We cannot change the human condition, but we can change the conditions in which humans work (3). Complications in endoscopic surgery are increasing; it has been shown that training and testing using a model is valid (4). Moreover, team's competences such as hierarchy, leadership, coordination, decision-making, communication, strategy, information sharing and coping with stress can be learned in simulation centres.

Learning and practicing without potential damage to the patient increases patient safety. Training some procedures using live patients is no longer ethically justified or acceptable to the patient. Patients expect health professionals to have fully mastered a procedure before using it on them. Procedures performed using a patient simulator can be interrupted, improved and repeated and, unlike in real life, no harm is done if a mistake is made. This training modality therefore imposes less stress on the trainee and the trainer, increasing the trainee's self-confidence. Because of the European Working Time Directive, the hours that the trainer and trainee spend together are reduced as well. The logical step forward is simulation training. Simulation-based training, mainly in anaesthesia, is already a part of the curricula in several European countries.

2 WHAT CAN BE TAUGHT IN SIMULATION UNITS AND HOW

During training, all three domains should be taught, learned and assessed: the cognitive domain, the psychomotor domain and the attitudes and behaviour domain. High-fidelity training devices such as fully automatic high-fidelity human patient simulators are available. Those specifically designed for training in anaesthesia, respiratory and critical care, provide respiratory gas exchange, anaesthesia delivery and patient monitoring with real physiological clinical monitoring. The trainee can: "talk" to the mannequin and get answers from the operator through a speaker in the mannequin's head. The trainee can check the pupils, which react to light, feel arterial pulses, listen to cardiac and lung sounds, and collect information on heart rate, blood pressure, respiratory rate and oxygen saturation. Medications and fluids can be administered to the simulator, which responds appropriately based on an interaction between the mannequin's current underlying physiology and the dose, pharmacokinetics and pharmacodynamics of the medication. In addition, a number of procedures such as airway management, cricothyroidotomy and chest drain insertion can be performed on the mannequin (5). Special mannequins exist for training in obstetrics (e.g. for vacuum delivery), paediatrics etc. For training and testing in endoscopic procedures, simple models (the pelvic trainer) are of great help.

Patient-Centred Acute Care Training (PACT) is the on line, modular programme for Intensive Care medicine of the European Society of Intensive Medicine (ESICM). It has been designed as an educational tool to improve and harmonize the quality of critical care delivery and training. A PACT Simulation Learning Module has been developed by Medical Education

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Technologies in conjunction with the ESICM. The learning module comprises 20 Simulated Clinical Experiences (Table 1).

Linking this learning module with high-fidelity patient simulators adds a new dimension to training in

intensive care. Similar simulated clinical experiences or scenarios exist to train teams' skills and communication in obstetrics and gynaecology – e.g. preeclampsia/eclampsia and postpartum haemorrhage – in paediatrics and other specialties

Table 1. 20 Simulated Clinical Experiences (part of the ESICM PACT Simulation Learning Module) .

Tabela 1. Simulirane klinične izkušnje (del ESICM PACT modula za simulacijsko učenje).

- SCE 1: Acute myocardial infarction and cardiogenic shock
- SCE 2: Traumatic brain injury 1: immediate management
- SCE 3: Traumatic brain injury 2: intensive care management
- SCE 4: Airway management
- SCE 5: Sepsis 1
- SCE 6: Sepsis 2
- SCE 7: Altered consciousness and sub-arachnoid haemorrhage
- SCE 8: Hypertension and left ventricular failure
- SCE 9: Hypertension, haemorrhage and haemodynamic monitoring
- SCE 10: Intoxication 1: Hyper-pyrexia
- SCE 11: Respiratory failure and ARDS
- SCE 12: Peritonitis
- SCE 13: Acute Renal Failure
- SCE 14: Neuromuscular diseases 1: cardio-vascular aspects
- SCE 15: Recognition and management of the acutely ill patient: acute asthma
- SCE 16: COPD and advanced ventilation
- SCE 17: Transportation and burns
- SCE 18: Intoxication 2: Multiple agents, arrhythmias
- SCE 19: Brain stem death
- SCE 20: Neuromuscular diseases 2: respiratory aspect

3 THE MEDICAL SIMULATION UNIT IN THE UNIVERSITY MEDICAL CENTRE, LJUBLJANA

At the UMCL, the Medical Simulation Unit was opened on June 29th 2011. It is a multidisciplinary centre that can deliver a diverse number of training activities to physicians, nurses and other health workers. There is one operating theatre with an associated control room, one intensive care unit with an associated control room, two briefing/debriefing rooms with e-learning possibilities, and accompanying utilities. At the present time, it has two high-fidelity mannequins (one adult and one paediatric). Until November 28th, there were already 10 whole day courses (ADLS, Training the Trainers – basic and advanced level, etc.), 7 half day courses and 6 training sessions less than 4 hours in duration.

4 CONCLUSION

The simulation centres are a parallel world where actual practice is mirrored and improved. Learning from mistakes is done with no harm to the patients. Simulation centres also lead to dangers of course: do trainees really improve their performance afterwards when managing real patients? There may be too much simplification of complicated reality. The trainees are isolated from their teams. How is one going to find oneself in unexpected real-world situations?

Simulation-based clinical training is a supplement not a replacement for traditional training and the maintenance of competence. It has been identified that simulation-based clinical training can shorten the learning curve, permit the development of manual skills before patient exposure, improve performance under stress, improve team work and optimise communication. It is more than just a novel education strategy. Over the next decade, it should mature into a key tool for error mitigation (6, 7, 8).

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