

## **Use of simulation in Anaesthesiology training: A Sri Lankan perspective**

During the recent past, the use of technology enhanced simulation in teaching and training in healthcare has experienced an exponential growth and thereby signifying a revolution in medical education.

With simulator training, realistic clinical scenarios are animated through a combination of advanced technology and role play without waiting for the training through clinical encounters. This will provide the learner the opportunity to study in a safe and standardised environment to practice management of emergencies and this perception captures the training in anaesthesia and critical care. A high degree of reality can be utilised within the practise of teaching and training in anaesthesia, which will greatly assist in dealing with high risk and life-threatening events. Learning this way offers no risk for a real patient while allowing practice on clinically rare scenarios. Simulators are also used to teach procedural skills and can be used to teach psychomotor and cognitive skills. Simulation can be stopped or restarted for teaching and it opens doors to allow reviewing if supplemented by videotaping.

Only with the benefit of advanced simulation tools can training in anaesthesia be realistically portrayed for real time teaching and learning. Depending on the ability to reproduce reality, three types of simulator mannequins can be described. i.e. low, medium and high fidelity models. A high-fidelity mannequin is said to very closely recreate the human anatomy and physiology. Computer-controlled patient simulator mannequins come under this category.

Simulation offers a chance to rehearse some procedural skills which are not commonly encountered in routine anaesthetic practises which may be lifesaving. Emergency airway management is a good example of this.

Looking back at history, in the 1960s, SimOne, a computer-controlled mannequin patient simulator was designed. The “Comprehensive Anaesthesia

Simulation Environment (CASE)” system happens to be the first commercially available patient simulator. Mannequins and its associated technologies are improving rapidly with the advent of personal computers and developing software capabilities. Virtual Reality simulation offers the possibility of understanding complex concepts.

Teaching dimensions of simulator models cannot only be used for an individual to learn the procedural skills, but also non-technical skills, which are important for the total management of anaesthesia. Examples for such skills are situation awareness, decision making, team work etc. D Gaba and his team adopted this to develop the Anaesthesia Crisis Resource Management (ACRM) programme, to teach the principles of team behaviour in crisis situations, and assesses decision making, interpersonal communication and team management skills which can be applied in the training of emergency medicine and intensive care as well.

But having said that, the efficacy of training with a high fidelity simulator in comparison to traditional methods of teaching is found difficult to prove. This controversy has also been fuelled by the expensive nature of the stimulators. Also there are not many research projects available to support the improvement of the patient outcome.

There are also arguable discussions as to what extent training through simulation is effective in Anaesthesia. This was negatively evidenced by the occurrence of recent air craft accidents, since the pilots were also trained using the same techniques, and it is from them that the idea of training management of critical incidents by simulation in Anaesthesia were originated. There is no doubt that we must be vigilant of the possible shortcomings of simulator training, since it might lead to inadequately trained doctors with uncertain management planes, thus leading to catastrophe.



In Sri Lanka traditionally we relied on the exposure to actual patients to gain expertise in managing life threatening and high risk events and procedures, which has been proven to be effective. We can supplement this by early exposure to simulation-based training with well organised training models to train clinical and nonclinical skills. This will enable the trainees to practise and engage in repetitive practise before encounters with real clinical challenges.

The training models should be properly planned to include technical and nontechnical skills, as the anaesthesia field has management which requires clinicians to be active, energetic and making incidental decisions. The anaesthetic equipment is also becoming more sophisticated, and thus the necessity for this snowballs. Also, these models must include situations a trainee might not get exposed to during their training because of the rarity and the established time frame. Thus, we must think about the long-term skill retention as well as the transferring ability of these skills to the operating theatre when planning these scenarios.

Apart from the mannequins the standards and the facilities of the simulation centre also contributes to the proper training. To achieve the full potential of the simulation training the simulation centre should include a full scale operating room, emergency room, trauma bay, and critical care unit. This has become a major concern in our setting since we do not have well equipped training centres, and thus should be our goal.

Currently the decision making authorities in Sri Lanka are working towards the implementation of the simulator training method as a teaching methodology. Even though we look forward to enriching the training with high fidelity mannequins until such time we should not forget that even the less expensive models can be used to deliver training which has acceptable educational value. Hence the methodology could be put into practice with hybrid versions.

Simulation offers a way forward to acquire these skills in a controlled manner and will prove as a valuable tool towards our professional development. With the expertise we have in Sri Lanka we should be able to incorporate this important teaching tool into our training.

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