EDITORIAL

Simulation Benefits Both the Teacher and the Taught

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Simulation (the act of simulating) is described as the imitative representation of the functioning of one system or process by means of the functioning of another. The other way of describing simulation is "the examination of a problem often not subject to direct experimentation by means of a simulating device." The latter description applies to simulation training in medicine in general and in critical care in particular.

In general, hands-on training in the field of medicine has hinged on cadaver models in the early years of training to workshop-based training later. The learning processes related to surgical skills have long been structured on mechanically and electronically simulated models. Training in the field of critical care probably needs a specifically designed simulator, essentially to reflect the multisystem interactions that are typical of critical illness. These complexities and their management cannot be easily explained at the bedside of a sick patient. Errors of judgment and decision making should obviously be made on a mechanical model.

Schroedl[1] et al. studied the impact of simulation-based education to improve resident learning and patient care. This study compared residents who were trained bedside with those who were trained by simulation in addition. The simulation-based training was rather short (4 hours). They were trained in the essential skills of managing shock and respiratory failure—the two common problems faced in the ICU. This study showed higher scores for the simulation-trained residents. Most of the simulation-trained residents felt that the training boosted the self-confidence and perceived it as a required component of residency education before starting care of critically ill patients.

Simulation probably helps in organizing the delivery of critical care in several ways.[2] First, assessing where simulation is needed in individual settings is essential. Key trainers can then be identified who will be able to implement the program. Definite course objectives should then be laid out and the scenarios built to implement and achieve the objectives. The experience of simulation training should always be evaluated to know the extent of realization of objectives.

One of the areas where simulation is crucial is in learning invasive procedural skills. Huang[3] et al., in a systematic review, found strong evidence for the efficacy of simulation in teaching bedside procedures. Beal[4] et al. in a meta-analysis concluded that medical students found simulation to be better than other approaches for learning critical care skills. Learning other technical skills like mechanical ventilation and point-of-care ultrasound was also shown to be better with simulation-based programs.[1,5]

In this issue of the IJCCM, Havaldar et al.[6] attempted to evaluate the physician performance before and after a simulation-based training program essentially focusing on hemodynamics and mechanical ventilation. Their training program focused on understanding the physiological principles of hemodynamics and gas exchange. Following a pretest assessment, the cohort of trainees underwent a two-day training program followed by a posttest assessment. The group included both students and critical care teachers. The simulator was indigenously developed and could replicate common ventilator waveforms on a familiar interface. Similarly, the common pattern of hemodynamic variations and rhythm disturbances could be replicated on the simulator. The training focused on explaining mechanical ventilation on a model of altering resistance and compliance. Pre- and posttest scores showed statistically significant increments for both mechanical ventilation and hemodynamics, more so for the former. Interestingly, teachers showed a pattern of improvement similar to the students. This emphasizes the fact that learning of a concept based on simulation could change established notions and understanding of physiology. The specialty of the trainees also did not influence the extent of posttest improvement. This simulator appears to have the ability to represent heart–lung interactions and their response to interventions. This is an essential skill which ICU trainees have to learn. While there seems to be a statistically significant improvement in the understanding of the two core principles of ICU care at the end of two days, translation into better clinical care may be the true end point to be evaluated at the end of such sessions. In addition, comparison with conventional teaching and learning was not involved in this study. That may actually identify the gaps in knowledge which simulation can fill.

Overall, this study seems to highlight the fact that learning ICU skills through a simulation-based program is feasible and confers a learning benefit not only to the beginners but also to the teachers who would teach them.

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