

Simulation in Anesthesia Education: Educational Issues and Practical Implications

Elena J. Holak, M.D., PharmD., Olga Kaslow, M.D., Yanina Symkowski, M.D., ASATT,
Harvey J. Woehlck, M.D., Mislav Tonkovic-Capin, M.D., and Gregory H. Diciaula, B.A.
Department of Anesthesiology, Medical College of Wisconsin and Zablocki
VA Medical Center, Milwaukee, Wisconsin

Introduction

Clinical medical education depends upon availability of “good teaching cases”. Trainees hope to see patients of sufficient scope and variety to develop skills needed for independent practice. Time, chance, and patient’s needs often limit exposure. We utilize simulation to mitigate the inherent variability of standard clinical teaching and augment deficiencies.

Methods

Our interactive simulation lab begins with learning basic technical skills utilizing mannequins. Technical management, procedural indications and contraindications are taught in a systemic fashion. Our daylong interactive invasive procedures workshop begins with a brief verbal introduction and video presentation whereby goals and objectives are delineated. Six hour-long interactive stations are covered. These include an airway, lumbar puncture/spinal, arterial line, central venous line and a two-part intravenous line placement station. Each station begins with a 10-15 minute videotape demonstrating the skill to be learned. Indications, contraindications and complications are thoroughly delineated.

Upon completion of the workshop each trainee advances to the simulation portion of the curriculum. Equipped with an anesthesia machine and full monitoring capability, our simulation lab houses “Stan”, the anatomically correct and physiologically responsive computer driven mannequin. Mask ventilation, intubation skills and induction sequence are reviewed. Management of the ventilator is introduced with detailed explanation of operation including warnings and alarms. Saline filled bar-coded syringes provide for drug dosage calculation and intravenous administration. Ample opportunity is given to rehearse the complete induction sequence. The introduction of simple scenarios allows for exposure of common uncomplicated intraoperative events.

As the trainee’s skill and comfort level increase, more serious complications are introduced into the scenarios requiring greater management skills, providing effective learning without patient risk. Full autonomy is granted allowing the trainee to experience firsthand the sequellae of selected treatment modalities. The staff anesthesiologist fully debriefs the trainee regarding case management, treatment modalities and sequellae. The trainee may elect at this time to revisit the case scenario armed with this added information.

Results

Program benefits include greater confidence in patient management, exposure to common and rare complications, and heightened awareness of all facets of intraoperative preparedness, thus, hopefully translating into greater patient safety with real patients in the operating room.