Curriculum 9

Anesthesia Resident Training in Neurophysiologic Monitoring Utilizing the Human Patient Simulator

Annette Rebel, M.D.; Kevin W. Hatton, M.D.; Christopher T. Hayes, M.D.; Sean C. Sardam, M.D.;
Zaki-Udin Hassan, M.D.
University of Kentucky

Learner Audience: Anesthesiology Residents CA1-CA3

Background: Somatosensory evoked potential monitoring (SSEP) is being used with increasing frequency to monitor spinal cord function in the perioperative period to reduce the incidence of postoperative neurological deficits. Technical, anesthetic, and surgical factors may have a significant impact on the ability to correctly interpret SSEP monitoring; therefore, it is important for anesthesiology personnel to have an understanding of the basic manipulations of these factors based on SSEP waveform interpretation. Due to significant concerns about patient safety, it may not be appropriate to significantly alter these conditions as a method of teaching about SSEP monitoring during the intraoperative period when most, if not all, SSEP monitoring would occur.

Needs Assessment: In an informal survey, both faculty and anesthesia residents agreed that more training should be dedicated to neurophysiological monitoring.

Hypothesis: Previous publications have shown that the patient simulator is a valuable tool for improving anesthesiology resident skill level and patient management ability in conditions such as difficult airway management, one-lung ventilation, and cardiopulmonary bypass. Therefore, we expanded the use of the human patient simulator (HPS) by adding SSEP information to specific clinical scenarios. The goal of this project was to combine the clinical information at the patient simulator with additional graphical information simulating the changes in SSEP to provide conditions similar to those that might be seen during real neurosurgical interventions.

Curriculum Design: We have developed a computer program that was able to display SSEP information simultaneous to the clinical information available with the HPS. During the simulation scenarios, clinical situations were linked with SSEP changes related to anesthetic agents, spinal cord dysfunction, anemia, systemic hypotension or nerve damage.

Outcome: The HPS experience with integrated SSEP waveform monitoring may improve the integration of SSEP waveform interpretation into the routine clinical care. After HPS training and completion of at least one clinical rotation in neuroanesthesiology, residents will repeat the HPS scenario and self-evaluate their own knowledge and experience.