

Forget Nostalgia! Anesthetize Me in 2008
by J. Jeff Andrews, M.D.

It is safer to undergo an anesthetic today than at any other time, and the reasons for this are multifactorial. Anesthesia training and education are better, and education is maintained throughout our careers. Our preoperative evaluations are extensive, and we make interventions preoperatively to minimize perioperative risks. Equipment, monitors, and drugs are better. We are outcomes-driven, and we carefully evaluate closed claims to enhance patient safety. Our airway management is better, not only because of newer equipment but also because of the development and implementation of the American Society of Anesthesiologists (ASA) difficult airway algorithm. And so, some might question whether the “good old days of anesthesia’ were really all that good.

When anesthesia residents complete their training now, they are better prepared to provide outstanding, safe anesthesia than ever. The Residency Review Committee (RRC) mandates a rigorous didactic curriculum, and it establishes the minimum number of various cases and procedures that the residents must perform in a 3-year time period. Beginning in July 2008, new RRC requirements will be implemented, and they are based on a four-year curriculum versus three. One area of added emphasis is additional Critical Care Medicine (CCM) training, and enhanced CCM training will translate into safer perioperative care. Throughout the training, the residency program director assures that the resident has accomplished the ACGME competencies and possesses the essential attributes which are crucial to the practice of anesthesiology. At the end of the training, the program director attests to the competency of the resident, and the program director states that the resident is capable of practicing independently. The American Board of Anesthesiology (ABA) requires that the anesthesia resident pass both a rigorous written and oral examination in order to be board-certified. Many anesthesia residents elect to take fellowships in the various subspecialties of anesthesia. When they go into practice, they provide state-of-the-art care to very specific subpopulations of patients such as pediatric, neurosurgical, obstetric, cardiac, pain, and intensive care patients. Their additional training enhances subspecialty patient safety.

After completing an anesthesia residency or an anesthesia fellowship, learning and improving continue to be life long. For those ABA Diplomates with a time-limited certificate, they are immediately enrolled in the Maintenance of Certification in Anesthesiology (MOCA) program, and this program mandates professional standing assessment, life long learning and self-assessment (CME hours), successful completion of a cognitive examination, and a self-directed program of practice performance assessment and improvement. Thus, in today's anesthesia environment, education, training, and maintenance of certification requirements are more rigorous than ever.

Anesthesiologists have taken a very active role in the preoperative evaluation and preparation of patients for surgery. Our specialty was one of the first ones to preoperatively stratify patients based on their underlying disease by developing and implementing the ASA classification. Many patients are seen preoperatively in an outpatient setting with immediate access to sophisticated labs, imaging, and consultants. Based upon our findings, we make appropriate interventions to minimize the risk for the patient during the perioperative period. One notable area of success is the perioperative beta blockade of patients with cardiac risk factors, and this has enhanced patient safety.

During my quarter century in the field, anesthesia equipment and monitors have come a long way. When I entered anesthesia in 1980, it was fairly easy to deliver 32% halothane, 31% isoflurane or 23% enflurane with copper kettle vaporizers. With older anesthesia machines, it was possible to deliver 100 percent nitrous oxide and zero percent oxygen. We didn't have pulse oximetry or capnography, and we relied heavily on the "art of anesthesia." Occasionally, the first sign of an esophageal intubation was blueish discoloration of the skin (cyanosis) due to deficient oxygen in the blood. New anesthesia delivery systems meet rigorous American Society of Testing and Materials (ASTM) standards. Modern vaporizers and ventilators are substantially safer than older ones, and many of the new intraoperative ventilators provide almost all of the ICU-type ventilator modalities which may lead to better patient outcomes. Newer anesthesia delivery systems have a prioritized alarm system that helps prevent information

overload of anesthesia care providers. In 1993 the U.S. Food and Drug Administration (FDA) introduced the Anesthesia Apparatus Checkout Recommendations which have helped detect anesthesia machine problems preoperatively.

Pulse oximetry and capnography have made the practice of anesthesia substantially safer. In addition to these monitors, other monitors have helped considerably. Multigas analyzers have widespread use, and they assess the inspired and exhaled concentrations of oxygen and inhaled anesthetics. Quantitating the concentration of inhaled anesthetic minimizes the chance of overdose or patient awareness under anesthesia. Most EKG monitors are now capable of ST analysis, and this helps detect cardiac ischemia sooner. The perioperative use of transesophageal echocardiography (TEE) which was once used exclusively for cardiac patients, is now gaining more widespread use for non-cardiac patients throughout the perioperative period enhancing patient safety.

Today our drugs and inhaled anesthetics are better. Propofol has proven to be a useful and reliable drug. Newer muscle relaxants are more predictable than older ones in a variety of disease states, and neuromuscular junction function can be better assessed by our newer sophisticated nerve stimulators. Our new insoluble inhaled anesthetics have rapid onset, and they help provide rapid emergence with very little metabolism or toxicity. In the operating room setting, our drug labels are either color-coded or bar-coded, and this minimizes the chance of medication errors. Our modern IV infusion pumps virtually eliminate the chance of free flow, minimizing side effects of unharnessed vasoactive drugs. Today potassium chloride is supplied relatively dilute concentrations minimizing the chance of a hyperkalemic arrest.

Our specialty reviews closed claims on an ongoing basis to help identify areas where we can improve. In my opinion, we have made the most progress in the area of airway management. We now evaluate several physical criteria to help identify the difficult airway. In the operating room, we have an ever-expanding armamentarium of airway-management devices such as the fiberoptic bronchoscope, the Bullard laryngoscope, jet-ventilation devices, LMAs, and gum elastic stylets to handle just about

any difficult airway. More importantly, however, was the development, implementation, and refinement of the ASA Difficult Airway Algorithm for the management of the difficult airway. In my opinion, widespread use of this algorithm has greatly enhanced patient safety.

Sophisticated simulators are gaining wide-spread use, and they are a valuable resource not only for training anesthesiology residents, but also for maintaining skills and developing new skills throughout our careers. Fortunately, certain types of anesthesia emergencies occur very infrequently. A few examples include malignant hyperthermia (1:30,000), thyroid storm, certain equipment malfunctions, etc. A practitioner may go years without encountering any of these emergencies in his/her practice. In a matter of just a few minutes, simulations of many emergencies and appropriate management techniques can occur. The practitioner can learn to deal with these emergencies in an expeditious manner. In my opinion, wide-spread use of simulators now and in the future will enhance patient safety.

The ASA has always been a leading advocate of patient safety issues, and several ASA Committees are specifically dedicated to patient safety. The Anesthesia Patient Safety Foundation has brought to the forefront numerous important patient safety issues. In 2005, the Joint Commission on Accreditation and Healthcare Organizations (JCAHO) identified a dozen national patient safety goals, and 8 of 12 are directly applicable to perioperative care.

The anesthesia community has done a remarkable job in the area of patient safety, and most anesthesiologists are aware of our progress. However, we have not been so successful in educating the public regarding the safety of our specialty. Thus, this year the ASA Committee on Patient Safety and Risk Management has focused upon preparing additional literature to help educate the public about our advances in safety.