

ANESTHESIOLOGY

■ Avoiding Mucosal Damage during Airway Management. Ulrich-Pur *et al.* (page 933)

In this experimental cadaver investigation, Ulrich-Pur *et al.* compared the pressures exerted on the pharyngeal, tracheal, and esophageal mucosa by different airway management devices. In fresh cadavers, the researchers strategically placed microchip sensors on the anterior, lateral, and posterior surfaces of the proximal balloons or distal cuffs of seven different airway management devices. Included in the investigation were conventional endotracheal tubes, intubating laryngeal masks, and mask airways, as well as a laryngeal tube airway device.

Depending on the respective airway device, the cuff volume was increased in 10-ml increments (from 0–100 ml) at the proximal balloon, or in 2-ml increments (from 0–12 ml) at the distal cuff. In addition, mucosal pressures exerted by proximal cuffs were compared to the amount of inflation pressure recommended by manufacturers for emergency situations. The researchers found that, using a pharyngeal cuff volume of 40 ml, the intubating mask airway and the laryngeal mask airway devices exerted significantly higher pressures compared to the other devices. Although it is important to follow recommended pressure volumes, the observed differences in devices seen here did not appear to be clinically relevant. The authors note, however, that measurements and results in cadavers may not be comparable to those in awake and anesthetized patients.

■ Is Geography a Factor in Responsiveness to Rocuronium Bromide? Dahaba *et al.* (page 950)

Stimulated by other studies which have reported transatlantic differences in patients' sensitivity to neuromuscular blocking agents, Dahaba *et al.* conducted a prospective, controlled clinical study to ascertain how patients in different countries, with different lifestyle, diet, and ambient habits, responded to incremental doses of rocuronium bromide.

The team recruited 18 patients each from New Jersey; Graz, Austria; and Dalian Hospital in the People's Republic of China. Patients in the first two groups were Caucasian, whereas those in the Chinese group were of Han ancestry. The study drug for all three groups was obtained from the same European production line, transported under strict manufacturers' instructions, and was given within its shelf life, and its

administration was supervised by the same investigator in all three countries.

In all study patients, anesthesia was induced with 1.5 $\mu\text{g/kg}$ fentanyl and 2–3 mg/kg propofol until eye-lash reflexes were obtunded. Mechanical ventilation was maintained at 25–35 mmHg end-tidal carbon dioxide; anesthesia was maintained with propofol and remifentanyl. Neuromuscular block at the adductor pollicis muscle was evaluated using a mechanomyograph. After induction of anesthesia, a force transducer was attached to patients' thumbs and their ulnar nerves were stimulated supramaximally at the wrist *via* surface electrodes. After T₁% baseline stabilization, six consecutive incremental doses of 50 $\mu\text{g/kg}$ rocuronium were administered in a rapidly running infusion. After all six incremental doses, or if 100% twitch depression was achieved after any incremental dose, 300 $\mu\text{g/kg}$ rocuronium was administered in addition to the remainder of the incremental doses. After administration of the last incremental dose, patients were allowed to recover spontaneously from the neuromuscular block, and the times to 25% first twitch and 0.8 train-of-four ratios were recorded.

The effective doses required for 50%, 90%, and 95% first twitch depression (ED₅₀, ED₉₀, and ED₉₅) were significantly higher in Austrian and Han Chinese patients compared to American patients, and times to recovery of first twitch were shorter in Austrian and Chinese than in American patients. Due to the significant difference in rocuronium potency and duration of action between patients in these three countries, the authors recommend larger studies to determine dosage recommendations of rocuronium bromide for different geographic regions.

■ Practice Guidelines for Managing Patients with Sleep Apnea Reported. ASA Task Force (page 1081)

Pediatric and adult patients with obstructive sleep apnea (OSA), even if asymptomatic, present special challenges which clinicians must address in order to minimize the risk of perioperative morbidity or mortality. The American Society of Anesthesiologists appointed a 12-member Task Force to review published evidence, obtain opinions of consultants, and build consensus for practice guidelines for the perioperative management of patients with OSA. The Task Force included anesthesiologists in private and aca-

demic practices, a bariatric surgeon, an otolaryngologist, and two methodologists from the ASA Committee on Practice Parameters.

A comprehensive literature review identified 290 articles containing direct linkage-related evidence, culled from an initial 2000 journal citations. Each pertinent outcome was initially classified as supporting evidence linkage, refuting a linkage, or equivocal. Interobserver agreement among Task Force members and two methodologists was established by interrater reliability testing. Consensus was obtained from multiple sources: opinion surveys of consultants with expertise in the area; testimony from attendees at open forums held at national anesthesia meetings; and task force opinion and interpretation.

The resulting guidelines include recommendations for: preoperative evaluation and preparation of OSA patients; intra- and postoperative management; and criteria for discharge to unmonitored settings, from both inpatient and outpatient settings. The recommendations are weighted based on the strength of published evidence and the consensus among experts on the task force. For instance, regarding preoperative evaluation of patients with suspected OSA, the consultants agreed that, in the absence of a formal sleep study, a presumptive diagnosis of OSA may be made based on the following criteria: elevated body mass index, a weight or body mass index greater than the 95th percentile for their age in pediatric patients, increased neck circumference, snoring, congenital airway abnormalities, daytime hypersomnolence, inability to visualize the soft palate, and tonsillar hypertrophy. The consultants strongly agreed that observed apnea (by a spouse or family member) during sleep is an additional criterion. The guidelines proceed to outline proper preoperative preparation of patients, recommended precautions to be taken during surgery (such as extubation when patients are fully awake), and postoperative concerns regarding analgesia, oxygenation, patient positioning, and monitoring.

■ Changing Role Of Anesthesiology Surveyed in Rovenstine Lecture. Warner (page 1094)

The 44th Rovenstine Lecture was presented by Mark A. Warner, M.D., at the American Society of Anesthesiologists Annual Meeting, on October 24, 2005, in Atlanta, Georgia. The meeting, moved from its originally scheduled venue in New Orleans, commemorated the 100th anniversary of the specialty. In his address, Dr. Warner described his dreams for the future of the specialty. Anesthesiology, he said, must

cleave to its core values—commitment to the critically ill and patients in pain and commitment to improving the care and safety of patients—while adapting to a changing health care environment.

In the next decades, the practice of anesthesiology will be influenced by several new realities, according to Dr. Warner: changing patient demographics (notably, the influx of immigrants and the aging of the population), advances in genomics, and increased use of minimally invasive procedures. With the continuing elucidation of the human genome, anesthesiologists will be able to tailor perioperative drug therapy to target the unique genetic makeup of their patients. For instance, investigations of β -adrenergic receptor polymorphisms may allow targeting of perioperative β blockade and better management of patients with impaired vascular responsiveness. Similarly, knowledge of pharmacogenomic markers may soon yield information to predict patients' metabolism of common perioperative drugs such as warfarin and ondansetron.

Miniaturization and minimalization of surgical procedures also promise to modify anesthesia practices, Dr. Warner contended. In view of these shifting dynamics, anesthesiologists must prepare to change their models for delivering anesthesia care. With too few anesthesiologists and shrinking reimbursements, physician-intensive, one-on-one care will not be possible. Indeed, in healthy patients undergoing minimally invasive procedures, direct delivery of care may not be necessary. Physician oversight of well-trained sedation and critical care nurses, nurse anesthetists, and anesthesiology assistants offers a cost-effective model for delivering care to appropriately selected patients, Dr. Warner said.

In his conclusion, Dr. Warner noted that anesthesiologists possess unique skills which could be extended to new areas, expanding the influence and scope of the specialty. For example, anesthesiologists are already well trained and experienced in the intricacies of supervising care for medically complex patients, and could step into administrative roles entailing oversight of perioperative services to care for the increasing percentage of acutely ill, physiologically unstable patients who make up an increasing percentage of hospital-based practice. To take advantage of and expand upon scientific progress and process changes, the field of anesthesiology must develop, fund, and implement specialty-sponsored fellowships. In this way, anesthesiology can make significant contributions in the House of Medicine in the next 100 yr of its existence.

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