

ANESTHESIOLOGY

■ Authors Explore Strategies to Reduce Postoperative Catabolism. Donatelli *et al.* (page 253)

Searching for ways to reduce postoperative loss of body protein, Donatelli *et al.* infused amino acids in patients on the second day after colon surgery. Participants were first randomly assigned to receive either epidural blockade or patient-controlled analgesia with morphine. General anesthesia in both groups consisted of propofol, nitrous oxide in 40% oxygen, desflurane, fentanyl, and rocuronium. After surgery, patients in the epidural blockade group received a continuous epidural infusion of bupivacaine and fentanyl to maintain sensory block from T7 to L3 and a visual analog scale score of less than 4 at rest. The other group of patients was maintained with patient-controlled analgesia with intravenous morphine, also adjusted to obtain the same visual analog scale score of less than 4 at rest. Pain was assessed twice a day.

Studies were conducted on the second postoperative day after overnight fasting. The authors employed a 6-h period of a 3-h fasted state followed by a 3-h fed state to mimic metabolic responses associated with feeding. Stable isotopic tracers were infused to measure whole body glucose kinetics and protein turnover. Measurements were also performed to determine average values of whole body oxygen consumption, carbon dioxide production, and calculated respiratory quotient. After collecting blood and expired-air samples to determine baseline isotope enrichments, the team administered priming doses of glucose and leucine, followed by a continuous infusion. The team found that administration of amino acids decreased the catabolic response caused by surgery, and the effect was greater in the patient-controlled analgesia group.

■ Researchers Develop Scoring System to Evaluate Performance on Human Simulator. Scavone *et al.* (page 260)

As the use of general anesthesia for cesarean deliveries declines, anesthesiology residents have fewer opportunities to become proficient with this technique. Educators have recommended using surrogate training modalities such as simulation-based training to ensure patient safety. In this issue, Scavone *et al.* describe their use of a modified Delphi technique to develop an objective

scoring system for measuring resident performance of use of general anesthesia during a simulated scenario.

Obstetric anesthesiology faculty at the authors' institution generated a list of tasks key to cesarean delivery with general anesthesia. Then, six nationally recognized obstetric anesthesiologists were asked to rank the importance of the tasks. After three rounds of ranking, the authors had produced a training scenario that incorporated a weighted scoring system of 47 tasks, for a total possible score of 196.5 points. Third-year and first-year anesthesiology residents (eight of each) were recruited to validate the scoring system. Before the simulation of a cesarean delivery with general anesthesia, residents rated their own confidence level for performing the procedure. The scenario consisted of a "patient" with an umbilical cord prolapse, a normal Mallampati class I airway, and no significant medical problems. Residents chose how to monitor the patient, how to induce general anesthesia, and how to secure the airway. Members of the research team acted as a "surgeon" and a "circulating nurse" and responded to the residents' questions and intraoperative communications, such as when to begin incision. Residents were videotaped throughout the procedure, and the videotapes were scored, using the weighted checklist, by four different attending obstetric anesthesiologists.

Third-year residents scored an average of 150.5 points, and the first-year residents scored an average of 128 points. The scoring instrument demonstrated high interrater reliability, and may prove useful for future studies investigating the effect of simulator training on objective assessment of resident performance.

■ A Model Developed to Classify Anesthetic Drug Interactions. Fidler and Kern (page 286)

Fidler and Kern developed a novel pharmacodynamic interaction model, combining principles from other models such as that developed by Minto *et al.* with a flexible interaction approach. The authors developed the new model to identify pharmacologically meaningful interaction-related parameters and address mathematical limitations of previous models. Both the flexible interaction and the Minto models can test for interactions (defined by Loewe) that are synergistic, antagonistic, and additive when E_{max} and γ are constant for all drug combinations being fit. The authors compared their model to the Minto model using the same data set from 400

women undergoing elective gynecologic surgery who received combinations of propofol, alfentanil, and midazolam. Response to verbal command to open the eyes was assessed at the time when the peak concentrations for the anesthetics were estimated to occur—propofol and alfentanil at 2 min, midazolam at 4 min.

The authors found that their flexible interaction model was able to accurately classify drug interactions for two or three agents and determine additivity, synergism, and antagonism. Their new proposed model also fit the clinical interaction data as well or slightly better than did the Minto model.

■ Review of Anesthesia in Cases of Congenital Hyposensitivity to Pain. Weingarten *et al.* (page 338)

Weingarten *et al.* searched the Mayo Clinic medical records database for patients with congenital hyposensitivity to pain who underwent general anesthesia from January 1996 to November 2005. They were able to identify seven patients with hereditary sensory and autonomic neuropathy II, IV, and V who had had a total of 17 general anesthesia procedures: 12 for orthopedic

operations, 3 for sural nerve biopsies, and 2 for ophthalmologic procedures. Because there is currently no consensus regarding anesthetic risks or intraoperative analgesic needs of patients with hereditary sensory and autonomic neuropathy, the authors reviewed the courses of these cases to see if they could contribute to the knowledge regarding management of their cases.

All of the patients had been under the age of 16 at the time of their procedures. Their anesthesia was conducted using concentrations of volatile agents expected to be administered to patients without hyposensitivity to pain. In eight patients, opioids were used intraoperatively, and only one received an opioid in the recovery room. Even after major orthopedic operations, these patients did not require additional analgesia. All were hemodynamically stable during uneventful anesthesia, and most experienced mild hypothermia, easily managed with warming blankets or by adjusting environment temperatures. Due to the infrequency of these disorders, large-scale studies are not possible. It is hoped that reviews of anesthetic management, such as this one, can contribute to knowledge regarding the safety of anesthesia in these patients.

Gretchen Henkel