



ON THE COVER:

Disparity exists in anesthesia practices between high- and low-to-middle income countries. The establishment of international collaborations and appropriate practice guidelines may improve care. In this issue of ANESTHESIOLOGY, Yuill *et al.* assess the impact of a multiyear collaboration on obstetric anesthesia practices in the Republic of Armenia. A multinational team of physicians conducted six visits to Armenia between 2006 and 2015 to observe current practice and establish standards of obstetric anesthesia care. Over the course of the collaboration, guidelines for obstetric anesthesia were drafted and approved by the Armenian Ministry of Health. Collaboration to update and standardize obstetric anesthesia practices led to national practice guidelines and sustained improvements in clinical care in the Republic of Armenia.

- Yuill *et al.*: Establishing Obstetric Anesthesiology Practice Guidelines in the Republic of Armenia: A Global Health Collaboration, p. 220

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■ SPECIAL ARTICLE

◆ Establishing Obstetric Anesthesiology Practice Guidelines in the Republic of Armenia: A Global Health Collaboration

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G. Yuill, A. Amroyan, S. Millar, E. Vardapetyan, A. S. Habib, and M. D. Owen

There is little information describing the dissemination of guidelines for obstetric anesthesia care from high- to low-to-middle income countries. This article describes the development and implementation of national obstetric anesthesia practice guidelines in Armenia.

◆ Refers to This Month in Anesthesiology

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■ PERIOPERATIVE MEDICINE

CLINICAL SCIENCE

- ◆ Association between Exposure of Young Children to Procedures Requiring General Anesthesia and Learning and Behavioral Outcomes in a Population-based Birth Cohort 227

D. Hu, R. P. Flick, M. J. Zaccariello, R. C. Colligan, S. K. Katusic, D. R. Schroeder, A. C. Hanson, S. L. Buenvenida, S. J. Gleich, R. T. Wilder, J. Sprung, and D. O. Warner

In a more recent population-based birth cohort in which contemporary anesthetic techniques were used, multiple, but not single, exposures before age 3 yr are associated with increased frequency of learning disabilities and attention-deficit/hyperactivity disorder. However, single exposures are associated with deficits in some domains of academic achievement tests. Although these data confirm previous reports and thus demonstrate a robust association, they do not permit evaluation of whether anesthesia *per se* is causal.

- ◆◆ CME Left Lateral Table Tilt for Elective Cesarean Delivery under Spinal Anesthesia Has No Effect on Neonatal Acid–Base Status: A Randomized Controlled Trial 241

A. J. Lee, R. Landau, J. L. Mattingly, M. M. Meenan, B. Corradini, S. Wang, S. R. Goodman, and R. M. Smiley

Maternal supine position during elective cesarean delivery with spinal anesthesia in healthy term women did not impair neonatal acid–base status compared to 15° left tilt when maternal systolic blood pressure was maintained with a phenylephrine infusion.

- ◆◆ Monitoring Anesthesia Care Delivery and Perioperative Mortality in Kenya Utilizing a Provider-driven Novel Data Collection Tool 250

B. Sileshi, M. W. Newton, J. Kiptanui, M. S. Shotwell, J. P. Wanderer, M. Mungai, J. Scherdin, P. A. Harris, S. H. Vermund, W. S. Sandberg, and M. D. McEvoy

Prospective real-time collection of postoperative mortality data for 21 months in a lower- to middle-income country showed procedure-specific differences in 7-day mortality. Mortality was highest in emergency surgery and lowest in cesarean delivery, the most common surgical procedure.

- ◆ Validation of Innovative Techniques for Monitoring Nociception during General Anesthesia: A Clinical Study Using Tetanic and Intracutaneous Electrical Stimulation 272

S. Funcke, S. Sauerlaender, H. O. Pinnschmidt, B. Saugel, K. Bremer, D. A. Reuter, and R. Nitzschke

Changes in the Analgesia Nociception Index and Surgical Pleth Index, as well as pupillary dilatation, were sensitive and specific for painful stimulation. The bispectral index is neither sensitive to painful stimuli nor the effects of analgesics and therefore is a poor marker of analgesia.

- ◆ Pupillometry-guided Intraoperative Remifentanyl Administration *versus* Standard Practice Influences Opioid Use: A Randomized Study 284

N. Sabourdin, J. Barrois, N. Louvet, A. Rigouzzo, M.-L. Guye, C. Dadure, and I. Constant

Objective pupil measurements were used to guide intraoperative remifentanyl dosing in order to maintain postinduction pupil diameter. In a randomized study, compared with standard approaches, patients in whom remifentanyl dosing was pupillometry guided received 50% less intraoperative remifentanyl and needed slightly less postoperative patient-controlled analgesia morphine.

- A Prospective Study of Age-dependent Changes in Propofol-induced Electroencephalogram Oscillations in Children 293

J. M. Lee, O. Akeju, K. Terzakis, K. J. Pavone, H. Deng, T. T. Houle, P. G. Firth, E. S. Shank, E. N. Brown, and P. L. Purdon

In 97 patients 0–21 yr old, propofol-induced electroencephalogram oscillations were qualitatively similar among patients 1 yr through adulthood (slow and coherent alpha oscillations), but not for children less than 1 yr (noncoherent alpha oscillations). Such age-dependent changes in electroencephalogram oscillations likely reflect critical neurodevelopmental changes and have implications for brain monitoring in children.

Blind Intubation through Self-pressurized, Disposable Supraglottic Airway Laryngeal Intubation Masks: An International, Multicenter, Prospective Cohort Study

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K. Ruetzler, S. E. Guzzella, D. W. Tscholl, T. Restin, M. Cribari, A. Turan, J. You, D. I. Sessler, B. Seifert, T. Gaszynski, M. T. Ganter, and D. R. Spahn

In this multicenter, prospective study, 99% of 1,000 patients with a supraglottic airway could be oxygenated and ventilated. Blind intubation succeeded in 78% of all patients, although the success rate significantly varied among the three centers (41, 80, and 84%), but when possible was easy, quick, and did not cause serious complications.

Predicting Perioperative Transfusion in Elective Hip and Knee Arthroplasty: A Validated Predictive Model

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J. To, R. Sinha, S. W. Kim, K. Robinson, B. Kearney, D. Howie, and L. B. To

Preoperative hemoglobin and hip (rather than knee) replacement predicts transfusion requirement. There was an interaction between age and gender, with transfusions being more often given in women more than 65 yr old.

Frequency and Type of Situational Awareness Errors Contributing to Death and Brain Damage: A Closed Claims Analysis

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C. M. Schulz, A. Burden, K. L. Posner, S. L. Mincer, R. Steadman, K. J. Wagner, and K. B. Domino

Situational awareness errors resulting in death or brain damage remain prevalent causes of malpractice claims in the 21st century.

CRITICAL CARE MEDICINE

CLINICAL SCIENCE

Extubation Success Prediction in a Multicentric Cohort of Patients with Severe Brain Injury

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K. Asehnoune, P. Seguin, S. Lasocki, A. Roquilly, A. Delater, A. Gros, F. Denou, P.-J. Mahé, N. Nessler, D. Demeure-dit-Latte, Y. Launey, K. Lakhal, B. Rozec, Y. Mallédant, V. Sébille, S. Jaber, A. Le Thuaud, F. Feuillet, R. Cinotti, and ATLANREA group

In patients who met at least three of the four VISAGE criteria (visual pursuit, swallowing, age, and Glasgow for extubation), successful extubation was achieved in the majority of patients with severe brain injury. The VISAGE score, which can be readily applied at the bedside, has the potential to predict successful extubation, permit earlier extubation, and reduce complications associated with prolonged mechanical ventilation.

BASIC SCIENCE

Ketamine and Etomidate Down-regulate the Hypothalamic–Pituitary–Adrenal Axis in an Endotoxemic Mouse Model

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E. Besnier, T. Clavier, M.-C. Tonon, J. Selim, A. Lefevre-Scelles, F. Morin, F. Tamion, B. Dureuil, H. Castel, and V. Compere

Induction of endotoxemia in mice by injection of lipopolysaccharide induced the relative failure of the hypothalamic–pituitary–adrenal axis function by down-regulation of the expression of major adrenocortical enzymes and likely relative adrenal insufficiency. Both etomidate and ketamine produced an early deficit of adrenal function in the endotoxemic model that was reversible within 48 h.

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N. Ohashi, D. Uta, M. Sasaki, M. Ohashi, Y. Kamiya, and T. Kohno

Direct application of *N*-acylphenolamine but not of acetaminophen reduced excitatory transmission in the spinal cord dorsal horn by direct activation of transient receptor potential vanilloid 1 receptors on presynaptic C-fiber terminals. Increased activity of transient receptor potential vanilloid 1 in inflammatory pain provides a mechanism by which acetaminophen may reduce inflammatory pain through its metabolite *N*-acylphenolamine.



Assessment of Behavioral Disruption in Rats with Abdominal Inflammation Using Visual Cue Titration and the Five-choice Serial-reaction Time Task

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T. J. Martin, T. J. Strassburg, A. L. Grigg, S. A. Kim, D. G. Ririe, and J. C. Eisenach

Performance in an operant task requiring sustained visual attention was developed as a rat model to study responses to nociception from intraperitoneal lactic acid-induced acute abdominal inflammation. Known analgesics morphine and ketoprofen dose-dependently reversed the effects of abdominal inflammation, but not the effects of the attention disruptor scopolamine, on performance deficits.

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Crisis checklists and emergency manuals are cognitive aids that help team performance and adherence to evidence-based practices during operating room crises. Resources to enable local implementation and training (key for effective use) are linked at <http://www.emergencymanuals.org>.

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