



## ON THE COVER:

Arterial cannulation is frequently used for continuous blood pressure monitoring and blood sampling in the operating room and intensive care unit. Arterial cannulation in pediatric patients is challenging, even for experienced anesthesiologists. In this issue of *ANESTHESIOLOGY*, Kim *et al.* evaluated the posterior tibial artery as an alternative arterial cannulation site to the radial artery in small children using ultrasound guidance. In an accompanying Editorial View, Adler and Litman advocate for the standard use of ultrasound guidance to facilitate arterial cannulation in children of all ages, and for practitioners to use this technique to evaluate alternate cannulation sites, in addition to the radial artery, when invasive monitoring is required.

- Kim *et al.*: Posterior Tibial Artery as an Alternative to the Radial Artery for Arterial Cannulation Site in Small Children: A Randomized Controlled Study, p. 423
- Adler and Litman: Out of the Darkness and into the Era of Direct Visualization and Deliberate Practice, p. 408

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<p><b>CLINICAL SCIENCE</b></p> <p><b>CME</b> ◆ <b>Intravenous Tranexamic Acid Bolus plus Infusion Is Not More Effective than a Single Bolus in Primary Hip Arthroplasty: A Randomized Controlled Trial</b> P. J. Zufferey, J. Lanoiselée, C. Chapelle, D. B. Borisov, J.-Y. Bien, P. Lambert, R. Philippot, S. Molliex, X. Delavenne; for the investigators of the PeriOperative Tranexamic acid in hip arthroplasty (PORTO) Study</p>	<p>413</p>

In a randomized, blinded trial comparing an initial bolus of tranexamic acid with an initial bolus followed by an infusion, blood loss was comparable in each group. Combining current results with five previous trials in a meta-analysis also shows no benefit of adding an infusion of tranexamic acid to an initial bolus.

◆ Refers to This Month in Anesthesiology

◆ Refers to Editorial Views

This article has an Audio Podcast

See Supplemental Digital Content

**CME** CME Article

This article has a Video Abstract

- ◆ ◆ **Posterior Tibial Artery as an Alternative to the Radial Artery for Arterial Cannulation Site in Small Children: A Randomized Controlled Study** 423  
 *E.-H. Kim, J.-H. Lee, I.-K. Song, J.-T. Kim, W.-J. Lee, and H.-S. Kim*  
 In an observational study of 60 children (median age, 13 months), radial, dorsalis pedis, and posterior tibial artery diameters averaged 1.5, 1.2, and 1.6 mm, respectively. In a prospective randomized study in 234 children (median age, 6 months), arterial cannulation first-attempt success rate was 83, 45, and 75% for radial, dorsalis pedis, and posterior tibial arteries, respectively. For ultrasound-guided arterial cannulation in small children, the posterior tibial artery is a reasonable alternative to the radial artery.
- 🌐 **Videolaryngoscopy versus Fiber-optic Intubation through a Supraglottic Airway in Children with a Difficult Airway: An Analysis from the Multicenter Pediatric Difficult Intubation Registry** 432  
*N. E. Burjek, A. Nishisaki, J. E. Fiadjoe, H. D. Adams, K. N. Peeples, V. T. Raman, P. N. Olomu, P. G. Kovatsis, and N. Jagannathan; for the PeDI Collaborative Investigators*  
 A clinical registry collecting information of 1,603 pediatric anesthesia cases with difficult tracheal intubation with conventional direct laryngoscopy revealed similar first-attempt success rates for fiber-optic intubation *via* supraglottic airway and videolaryngoscopy, whereas the former was more successful than the latter in infants.
- ◆ 🌐 **Reversal of Vecuronium-induced Neuromuscular Blockade with Low-dose Sugammadex at Train-of-four Count of Four: A Randomized Controlled Trial** 441  
*L. Asztalos, Z. Szabó-Maák, A. Gajdos, R. Nemes, A. Pongrácz, S. Lengyel, B. Fülesdi, and E. Tassonyi*  
 Sugammadex 0.5 mg/kg did not produce prompt and satisfactory neuromuscular recovery when administered at a threshold train-of-four count of four after vecuronium administration. Sugammadex 1.0 mg/kg adequately reversed this level of block, although recovery took twice as long as has been reported after rocuronium. Recurrent neuromuscular block occurred after treatment of this level of block with sugammadex doses of 0.5 to 2.0 mg/kg.
- ◆ **Mini-fluid Challenge of 100 ml of Crystalloid Predicts Fluid Responsiveness in the Operating Room** 450  
*M. Biaï, H. de Courson, R. Lanchon, B. Pereira, G. Bardonneau, M. Griton, M. Sesay, and K. Nouette-Gaulain*  
 The authors provide a prospective trial demonstrating that a mini-fluid challenge of 100 ml can predict the hemodynamic effects of larger fluid boluses in neurosurgical patients. The study has important implications to future fluid challenge algorithms and patient management to maximize hemodynamic stability and minimize the risk of fluid overload in the operating room.
- ◆ **Association of Testosterone Replacement Therapy and the Incidence of a Composite of Postoperative In-hospital Mortality and Cardiovascular Events in Men Undergoing Noncardiac Surgery** 457  
*M. Y. Argalious, J. You, G. Mao, D. Ramos, S. Khanna, K. Maheshwari, and C. Trombetta*  
 In a single-center observational analysis, testosterone replacement therapy was not associated with a measurable increase or decrease in cardiovascular events or mortality within 30 days of surgery.
- ◆ **Accuracy of Capillary and Arterial Whole Blood Glucose Measurements Using a Glucose Meter in Patients under General Anesthesia in the Operating Room** 466  
*B. S. Karon, L. J. Donato, C. M. Larsen, L. K. Siebenaler, A. E. Wells, C. M. Wood-Wentz, M. E. Shirk-Marienau, and T. B. Curry*  
 The authors have performed a study in the operating room of new glucose meter technology with hematocrit and interference correction on capillary and arterial blood samples in comparison with reference arterial whole blood glucose measurements by a blood gas analyzer. The authors found that arterial and capillary blood glucose measurements with the glucose meter did not meet established guidelines for intensive blood glucose control, suggesting caution be exercised when using glucose meters for intravenous glycemic control protocols.

◆◆🌐 **Simulation-based Assessment of the Management of Critical Events by Board-certified Anesthesiologists** 475



*M. B. Weinger, A. Banerjee, A. R. Burden, W. R. McIvor, J. Boulet, J. B. Cooper, R. Steadman, M. S. Shotwell, J. M. Slagle, S. DeMaria, Jr., L. Torsher, E. Sinz, A. I. Levine, J. Rask, F. Davis, C. Park, and D. M. Gaba*

To assess the technical and behavioral performance of board-certified anesthesiologists, those who were already attending simulation courses for American Board of Anesthesiology Maintenance of Certification participated in standardized study simulation scenarios that were video recorded for later scoring by blinded trained raters. In simulated emergencies, participants successfully completed approximately 80% of critical performance elements, while approximately 25% received low holistic rating. Higher-rated performances were not associated with previous simulation experience.

## BASIC SCIENCE

**Propofol Affects Neurodegeneration and Neurogenesis by Regulation of Autophagy via Effects on Intracellular Calcium Homeostasis** 490

*H. Qiao, Y. Li, Z. Xu, W. Li, Z. Fu, Y. Wang, A. King, and H. Wei*

In neural progenitor cell cultures, only extremely high concentrations of propofol for 24 h caused cell damage and impaired neuronal proliferation. Propofol effects appeared related to autophagy.

◆ **A Subregion of the Parabrachial Nucleus Partially Mediates Respiratory Rate Depression from Intravenous Remifentanyl in Young and Adult Rabbits** 502



*J. R. Miller, E. J. Zuperku, E. A. E. Stuth, A. Banerjee, F. A. Hopp, and A. G. Stucke*

Respiratory rate depression produced by intravenously administered remifentanyl could be substantially reversed with localized naloxone injection into a subregion of the parabrachial nucleus of the decerebrate rabbit, confirming the relevance of that area in opioid-induced respiratory depression.

## ■ PAIN MEDICINE

## BASIC SCIENCE

**Inhibition of Metabotropic Glutamate Receptor Subtype 1 Alters the Excitability of the Commissural Pyramidal Neuron in the Rat Anterior Cingulate Cortex after Chronic Constriction Injury to the Sciatic Nerve** 515

*S.-H. Gao, L.-L. Shen, H.-Z. Wen, Y.-D. Zhao, and H.-Z. Ruan*

In a rodent model of chronic constrictive injury, injury-induced hyperactivity of commissural fibers was associated with a reduction in voltage-gated potassium channel subunit 2-mediated current; metabotropic glutamate receptor inhibition produced an analgesic effect, restored voltage-gated potassium channel subunit 2 currents, and reduced hyperexcitability. The data support the notion that the analgesic efficacy of metabotropic glutamate receptor inhibition is in part mediated by reducing anterior cingulate cortex output to the contralateral cerebral cortex.

🌐 **Liver X Receptor  $\alpha$  Is Involved in Counteracting Mechanical Allodynia by Inhibiting Neuroinflammation in the Spinal Dorsal Horn** 534

*J. Xu, Y.-W. Feng, L. Liu, W. Wang, X.-X. Zhong, X.-H. Wei, and X.-G. Liu*

In male rodent models of spared nerve injury, intrathecal liver X receptor (LXR) agonists reduced mechanical allodynia. This effect was not observed in animals with a mutation in the LXR $\alpha$  receptor subtype. LXR agonist inhibited glial cell activation and expression of cytokines in the spinal dorsal horn.

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*S. Zhang, X.-N. Yang, T. Zang, J. Luo, Z. Pan, L. Wang, H. Liu, D. Liu, Y.-Q. Li, Y.-D. Zhang, H. Zhang, H.-L. Ding, and J.-L. Cao*

MiR-219-5p expression in the ventral tegmental area is reduced in the setting of hind paw inflammation and nociceptive sensitization. Nociceptive sensitization related to reduced miR-219-5p expression was related to astrocytic activation.

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*R. Kruisselbrink, V. Chan, G. A. Cibinel, S. Abrahamson, and A. Goffi*

The I-AIM (Indication, Acquisition, Interpretation, Medical decision-making) model is a conceptive framework uniquely applicable to every point of care ultrasound application. We present a systematic comprehensive approach to lung ultrasound based on the I-AIM framework.

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