



## ON THE COVER:

Discharge from the postanesthesia care unit (PACU) without observation of lower limb motor function after spinal anesthesia might significantly reduce PACU stay and enhance early rehabilitation after total joint replacement. In this issue of *ANESTHESIOLOGY*, Aasvang *et al.* test this hypothesis in a multicenter randomized trial. PACU discharge without assessment of lower limb motor function after spinal anesthesia was noninferior to motor function assessment in reducing hospital length of stay and readmissions.

- Aasvang *et al.*: Safety Aspects of Postanesthesia Care Unit Discharge without Motor Function Assessment after Spinal Anesthesia: A Randomized, Multicenter, Semiblinded, Noninferiority, Controlled Trial, p. 1043

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### Remifentanyl Dosing at Extremes of Body Weight

*S. L. Shafer and D. M. Fisher*

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### ◇ Lost in Translation: The 2016 John W. Severinghaus Lecture on Translational Research

*D. I. Sessler*

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## ■ PERIOPERATIVE MEDICINE

## CLINICAL SCIENCE

### ◆ An Allometric Model of Remifentanyl Pharmacokinetics and Pharmacodynamics

*D. J. Eleveld, J. H. Proost, H. Vereecke, A. R. Absalom, E. Olofson, J. Vuyk, and M. M. R. F. Struys*

1005

A general-purpose remifentanyl pharmacokinetic–pharmacodynamic model was developed using pharmacokinetic data from studies of adults and children and pharmacodynamic data from an adult study. Model parameters were influenced by the patient covariates fat-free mass, weight, age, and sex. The predictive performance of the model was in a clinically acceptable range for all subgroups considered and was better than that of a widely-used model, particularly in young children and children. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

### ◆ Disposition of Remifentanyl in Obesity: A New Pharmacokinetic Model Incorporating the Influence of Body Mass

*T. K. Kim, S. Obara, T. D. Egan, and the Remifentanyl Pharmacokinetics in Obesity Investigators*

1019

A general-purpose remifentanyl pharmacokinetic model was developed using pharmacokinetic data from studies of adults. Model parameters were influenced by the patient covariates total body weight, fat-free mass, and age but not body mass index or sex. This new model provides the pharmacokinetic basis for remifentanyl dosing calculations in obese and elderly adult patients. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◇ Refers to This Month in Anesthesiology

◆ Refers to Editorial Views

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CME Article



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This article has a Video Abstract

## ◆ **Effect of Dexmedetomidine and Propofol on Basal Ganglia Activity in Parkinson Disease: A Controlled Clinical Trial** 1033

A. Martinez-Simon, M. Alegre, C. Honorato-Cia, J. M. Nuñez-Cordoba, E. Cacho-Asenjo, I. F. Trocóniz, M. Carmona-Abellán, M. Valencia, and J. Guridi

Activity in the subthalamic nuclei was similar to the control, unsedated state in patients that received dexmedetomidine. By contrast, propofol produced a dose-dependent reduction in neuronal activity, especially in the beta frequency range. The data support the use of dexmedetomidine for sedation in patients undergoing deep brain stimulator implantation. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

## ◆ **Safety Aspects of Postanesthesia Care Unit Discharge without Motor Function Assessment after Spinal Anesthesia: A Randomized, Multicenter, Semiblinded, Noninferiority, Controlled Trial** 1043

E. K. Aasvang, C. C. Jørgensen, M. B. Laursen, J. Madsen, S. Solgaard, M. Krøigaard, P. Kjærsgaard-Andersen, H. Mandøe, T. B. Hansen, J. U. Nielsen, N. Krarup, A. E. Skøtt, and H. Kehlet

A multicenter, noninferiority study involving 1,376 patients undergoing lower extremity joint replacement surgery under spinal anesthesia was conducted to determine the benefit of motor assessment. Patients not receiving motor examination completed a fast-track course as frequently as those who were assessed. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

## **Risk of Epidural Hematoma after Neuraxial Techniques in Thrombocytopenic Parturients: A Report from the Multicenter Perioperative Outcomes Group** 1053

L. O. Lee, B. T. Bateman, S. Kheterpal, T. T. Klumpner, M. Housey, M. F. Aziz, K. W. Hand, M. MacEachern, C. G. Goodier, J. Bernstein, and M. E. Bauer, on behalf of the Multicenter Perioperative Outcomes Group Investigators

The Multicenter Perioperative Outcomes Group database and a systematic literature review were combined to estimate the relationship between platelet count and the risk of epidural hematoma requiring surgical decompression after neuraxial techniques. The upper bound of the 95% CI for epidural hematoma risk was 11% for a platelet count of 0 to 49,000 mm<sup>-3</sup>, 3% for 50,000 to 69,000 mm<sup>-3</sup>, and 0.2% for 70,000 to 100,000 mm<sup>-3</sup>. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

## **Brachial Arterial Pressure Monitoring during Cardiac Surgery Rarely Causes Complications** 1065

A. Singh, B. Bahadorani, B. J. Wakefield, N. Makarova, P. A. Kumar, M. Z.-Y. Tong, D. I. Sessler, and A. E. Duncan

Brachial artery cannulation for hemodynamic monitoring during cardiac surgery rarely causes complications.

## BASIC SCIENCE

## **Growth Arrest and DNA-damage-inducible Protein 45β-mediated DNA Demethylation of Voltage-dependent T-type Calcium Channel 3.2 Subunit Enhances Neuropathic Allodynia after Nerve Injury in Rats** 1077

C.-Y. Lai, M.-C. Hsieh, Y.-C. Ho, A.-S. Lee, H.-H. Wang, J.-K. Cheng, Y.-P. Chau, and H.-Y. Peng

The ligation of nerves in the rat hind limb both caused nociceptive sensitization and expression of growth arrest and DNA-damage-inducible protein 45β (Gadd45β) in spinal cord tissue. The abundance of Gadd45β controlled the expression of the calcium ion channel *voltage-dependent T-type calcium channel 3.2 subunit* through demethylation, which in turn appeared to modulate nociceptive sensitization.

## ◆ **Effect of Thoracic Epidural Anesthesia on Ventricular Excitability in a Porcine Model** 1096

K. Howard-Quijano, T. Takamiya, E. A. Dale, K. Yamakawa, W. Zhou, U. Buckley, and A. Mahajan

A porcine animal model was used to characterize the effects of thoracic epidural anesthesia on sympathetic stimulation and critical parameters of cardiac excitability. Thoracic epidural anesthesia reduced ventricular excitability and the proarrhythmic effects of sympathetic hyperactivity. The study adds important mechanistic insight to support the treatment of ventricular arrhythmias by thoracic epidural anesthesia.

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### ■ CRITICAL CARE MEDICINE

#### CLINICAL SCIENCE

-  **Prevalence and Impact on Weaning of Pleural Effusion at the Time of Liberation from Mechanical Ventilation: A Multicenter Prospective Observational Study** 1107

*M. Dres, D. Roux, T. Pham, A. Beurton, J.-D. Ricard, M. Fartoukh, and A. Demoule*

Pleural effusion was detected in 37% of patients and was significant in 13%. However, the presence of significant effusion was not associated with an increase in duration of—or weaning from—mechanical ventilation or with length of intensive care unit stay. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

- Clinical Judgment Is Not Reliable for Reducing Whole-body Computed Tomography Scanning after Isolated High-energy Blunt Trauma** 1116

*T. Mistral, V. Brenckmann, L. Sanders, J.-L. Bosson, G. Ferretti, F. Thony, S. M. Galvagno, J.-F. Payen, and P. Bouzat*

The diagnostic performance of clinical judgment in the prediction of the presence of significant lesions on computed tomography scan (CT) was modest and was considered to be insufficient. However, in patients with a completely normal physician examination, clinical judgment predicted the lack of a lesion on CT scan. The data suggest that clinical judgment is not sufficient to reduce the need for whole-body CT scans in patients with high-energy trauma.

#### BASIC SCIENCE

- Up-regulation of Intracellular Calcium Handling Underlies the Recovery of Endotoxemic Cardiomyopathy in Mice** 1125

*J. C. Morse, J. Huang, N. Khona, E. J. Miller, D. A. Siwik, W. S. Colucci, and I. A. Hobai*

The authors have performed a functional and molecular assessment of myocardial calcium handling in surviving mice in a preclinical model of sepsis. The authors have found a supernormal augmentation of heart function and myocytes calcium handling during the recovery phase of sepsis-induced cardiomyopathy that was associated with distinct changes in the expression and function of calcium-handling proteins in the heart. The work suggests the existence of an active myocardial recovery mechanism in sepsis, with significant implications toward possible future therapies.

### ■ PAIN MEDICINE


#### CLINICAL SCIENCE

-   **A Three-arm Randomized Clinical Trial Comparing Continuous Femoral Plus Single-injection Sciatic Peripheral Nerve Blocks *versus* Periarticular Injection with Ropivacaine or Liposomal Bupivacaine for Patients Undergoing Total Knee Arthroplasty** 1139

*A. W. Amundson, R. L. Johnson, M. P. Abdel, C. B. Mantilla, J. K. Panchamia, M. J. Taunton, M. E. Kralovec, J. R. Hebl, D. R. Schroeder, M. W. Pagnano, and S. L. Kopp*

In a three-arm randomized trial involving 165 adult knee arthroplasty patients, femoral and sciatic nerve blocks, ropivacaine-based periarticular injection, and liposomal bupivacaine-based periarticular injection all provided good analgesia. The peripheral nerve block strategy provided some advantages in terms of pain relief and opioid sparing at early time points after surgery.

#### BASIC SCIENCE

-  **Oral Application of Magnesium-L-Threonate Attenuates Vincristine-induced Allodynia and Hyperalgesia by Normalization of Tumor Necrosis Factor- $\alpha$ /Nuclear Factor- $\kappa$ B Signaling** 1151

*T. Xu, D. Li, X. Zhou, H.-D. Ouyang, L.-J. Zhou, H. Zhou, H.-M. Zhang, X.-H. Wei, G. Liu, and X.-G. Liu*

Vincristine-induced allodynia and hyperalgesia are reduced by oral magnesium-L-threonate administration. Oral magnesium-L-threonate administration also blocked tumor necrosis factor- $\alpha$ /nuclear factor- $\kappa$ B signaling and spinal cord neuroplasticity after vincristine administration. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

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- Carotid Body Paraganglioma: A Rare Tumor with Serious Anesthetic Challenges** 1170  
*A. T. Truong, S. Thakar, and D.-T. Truong*

#### EDUCATION

- ◇ 🌐 **Effectiveness of Written and Oral Specialty Certification Examinations to Predict Actions against the Medical Licenses of Anesthesiologists** 1171  
*Y. Zhou, H. Sun, D. J. Culley, A. Young, A. E. Harman, and D. O. Warner*

Using medical license action (most common types were substance use, license/board violation, malpractice, and unprofessional conduct) as an outcome, those passing neither examination and those passing only the written examination had a greater risk of receiving an action from a state medical board compared with those passing both examinations. Passing both the oral and written examinations, but not just written examination, is associated with a lower risk of subsequent license actions. These results suggest that the oral examination assesses domains not fully assessed in the written examination. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

#### CLINICAL CONCEPTS AND COMMENTARY

- ◇ **To Stop or Not, That Is the Question: Acute Pain Management for the Patient on Chronic Buprenorphine** 1180  
*T. A. Anderson, A. N. A. Quaye, E. N. Ward, T. E. Wilens, P. E. Hilliard, and C. M. Brummett*

Perioperative pain management suggestions for patients taking buprenorphine and presenting for elective and urgent/emergent surgery have been developed and are described here.

#### REVIEW ARTICLE

- 📄 ◇ **Cerebral Autoregulation-oriented Therapy at the Bedside: A Comprehensive Review** 1187  
*L. Rivera-Lara, A. Zorrilla-Vaca, R. G. Geocadin, R. J. Healy, W. Ziai, and M. A. Mirski*

In this review, the authors discuss the methodology and clinical applications of cerebral autoregulation monitoring, including an innovative application in which optimal cerebral perfusion pressure is calculated at the bedside.

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*S. Crowe*

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