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■ SPECIAL ARTICLES

🌐 **Practice Guidelines for the Prevention, Detection, and Management of Respiratory Depression Associated with Neuraxial Opioid Administration: An Updated Report by the American Society of Anesthesiologists Task Force on Neuraxial Opioids** 218

The American Society of Anesthesiologists Task Force on Neuraxial Opioids presents updated Practice Guidelines for the prevention, detection, and management of respiratory depression associated with neuraxial opioid administration. These Guidelines are intended to improve patient safety and enhance the quality of anesthetic care by reducing the incidence and severity of neuraxial opioid-related respiratory depression or hypoxemia. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

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## ■ PERIOPERATIVE MEDICINE

- ◆◆◆ **Perioperative Acute Ischemic Stroke in Noncardiac and Nonvascular Surgery: Incidence, Risk Factors, and Outcomes** 231  
*Brian T. Bateman, H. Christian Schumacher, Shuang Wang, Shahzad Shaefi, and Mitchell F. Berman*  
 This study examines the epidemiology of perioperative acute ischemic stroke (AIS) in three common surgeries—hemicolecotomy, total hip replacement, and lobectomy/segmental lung resection. Patients 18 yr and older who underwent any of the surgical procedures listed above were extracted from the Nationwide Inpatient for years 2000 to 2004. Multivariate logistic regression was performed to identify independent predictors of perioperative AIS. For patients older than 65, AIS rose to 1.0% for hemicolecotomy, 0.3% for hip replacement, and 0.8% for pulmonary resection. Perioperative AIS is an important source of morbidity and mortality associated with noncardiac, nonvascular surgery, particularly in elderly patients. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT
- ◆◆ **Factor XIII Substitution in Surgical Cancer Patients at High Risk for Intraoperative Bleeding** 239  
*Wolfgang C. Korte, Christine Szadkowski, Anita Gähler, Konrad Gabi, Edward Kownacki, Monika Eder, Priska Degiacomi, Norbert Zoller, Jan Devay, Jochen Lange, and Thomas Schnider*  
 Early use of factor XIII in patients at high risk for intraoperative bleeding results in significant reduction of loss of clot firmness, reduction of fibrinogen consumption, and reduction of blood loss.
- ◆ **Perioperative Ischemic Optic Neuropathy: A Case Control Analysis of 126,666 Surgical Procedures at a Single Institution** 246  
*Sarah E. Holy, Jonathan H. Tsai, Russell K. McAllister, and Kyle H. Smith*  
 Ischemic optic neuropathy is the most common cause of perioperative vision loss. The authors performed a retrospective case-control study to determine the incidence of and the risk factors for perioperative ischemic optic neuropathy associated with nonophthalmologic surgery. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT
- Neurocognitive Performance in Hypertensive Patients after Spine Surgery** 254  
*Gene T. Yocum, John G. Gaudet, Lauren A. Teverbaugh, Donald O. Quest, Paul C. McCormick, E. Sander Connolly, Jr., and Eric J. Heyer*  
 Postoperative cognitive dysfunction is a common occurrence in elderly patients. This study suggests that there may be an association between intraoperative minimum mean arterial pressure and postoperative cognition in older hypertensive patients undergoing spine surgery.
- Prospective Clinical and Fiberoptic Evaluation of the Supreme Laryngeal Mask Airway™** 262  
*Arnd Timmermann, Stefan Cremer, Christoph Eich, Stephan Kazmaier, Anselm Bräuer, Bernhard M. Graf, and Sebastian G. Russo*  
 This prospective clinical evaluation of the LMA Supreme™ showed easy insertion, optimal laryngeal fit (as assessed by fiberoptic view), oropharyngeal leak pressures comparable to data known from the LMA ProSeal™, and low airway morbidity.
- High Body Mass Index Is a Weak Predictor for Difficult and Failed Tracheal Intubation: A Cohort Study of 91,332 Consecutive Patients Scheduled for Direct Laryngoscopy Registered in the Danish Anesthesia Database** 266  
*Lars H. Lundstrøm, Ann M. Møller, Charlotte Rosenstock, Grethe Astrup, and Jørn Wetterslev*  
 High body mass index is a weak predictor of difficult and failed tracheal intubation and may be more appropriate than weight in multivariate models of prediction of difficult intubation.

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## **Effects of Intraoperative Reading on Vigilance and Workload during Anesthesia Care in an Academic Medical Center**

275

*Jason M. Slagle and Matthew B. Weinger*

Intraoperative reading typically occurs during periods of low workload and does not appear to adversely affect the response latency to an alarm light.

## **Reversal of Rocuronium-induced Neuromuscular Blockade with Sugammadex in Pediatric and Adult Surgical Patients**

284

*Benoît Plaud, Olli Meretoja, Rainer Hofmockel, Julien Raft, Peter A. Stoddart, Jacqueline H. M. van Kuijk, Yvonne Hermens, and Rajinder K. Mirakhor*

Sugammadex effectively reverses rocuronium-induced neuromuscular blockade in both adults and pediatric patients.

## **Propofol and Midazolam Inhibit Conscious Memory Processes Very Soon after Encoding: An Event-related Potential Study of Familiarity and Recollection in Volunteers**

295

*Robert A. Veselis, Kane O. Pryor, Ruth A. Reinsel, Yuelin Li, Meghana Mehta, and Ray Johnson, Jr.*

Event-related potentials can distinguish brain processes underlying similar behavioral impairments. Low doses of propofol and midazolam inhibited processes supporting recognition of pictures 27 s after encoding in somewhat different ways.

## ◆ **Increased Volatile Anesthetic Requirement in Short-sleeping *Drosophila* Mutants**

313

*Bernd Weber, Christian Schaper, Daniel Bushey, Marko Rohlf, Markus Steinfath, Giulio Tononi, Chiara Cirelli, Jens Scholz, and Berthold Bein*

The authors show that the severity of the short-sleeping *Drosophila* phenotype correlates with an increase in anesthetic requirement among the different *Drosophila* mutants, thereby linking sleep and anesthesia on a molecular level.

## **Role of Heat Shock Protein 90 and Endothelial Nitric Oxide Synthase during Early Anesthetic and Ischemic Preconditioning**

317

*Julien Amour, Anna K. Brzezinska, Dorothee Weihrauch, Amie R. Billstrom, Jacek Zielonka, John G. Krolkowski, Martin W. Bienengraeber, David C. Warltier, Philip F. Pratt, Jr., and Judy R. Kersten*

Heat shock protein 90 and its binding partners, such as endothelial nitric oxide synthase, play crucial roles in nitric oxide-mediated signaling during anesthetic and ischemic preconditioning of myocardium.

## **Behavior and Cellular Evidence for Propofol-induced Hypnosis Involving Brain Glycine Receptors**

326

*Hai T. Nguyen, Ke-yong Li, Ralph L. daGraca, Ellise Delphin, Ming Xiong, and Jiang H. Ye*

Strychnine, the glycine receptor antagonist, dose-dependently reduced propofol-induced loss of righting reflex in rats and propofol-induced current of rat hypothalamic neurons. These results suggest that neuronal glycine receptors partially contribute to propofol-induced hypnosis.

## ■ **CRITICAL CARE MEDICINE**

### ◆ **Predictors Associated with Terminal Renal Function in Deceased Organ Donors in the Intensive Care Unit**

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*Annabel Blasi-Ibanez, Ryutaro Hirose, John Feiner, Chris Freise, Peter G. Stock, John P. Roberts, and Claus U. Niemann*

Hyperglycemia is prevalent in organ donors and may contribute to decline in renal function before organ recovery. Implementation of improved glucose monitoring and control is desirable.

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- ◆ **Effects of Different Levels of Pressure Support Variability in Experimental Lung Injury** 342  
*Peter M. Spieth, Alysson R. Carvalho, Andreas Güldner, Paolo Pelosi, Oleg Kirichuk, Thea Koch, and Marcelo Gama de Abreu*  
 The authors demonstrated that gas exchange and lung mechanics respond differently to diverse levels of pressure support variability and that a variability level of 30% yields the best compromise between gas exchange and respiratory system mechanics.
- ◆ **Early Packed Red Blood Cell Transfusion and Acute Respiratory Distress Syndrome after Trauma** 351  
*Onuma Chaiwat, John D. Lang, Monica S. Vavilala, Jin Wang, Ellen J. MacKenzie, Gregory J. Jurkovich, and Frederick P. Rivara*  
 Early packed red blood cell transfusion is an independent predictor of acute respiratory distress syndrome in adult trauma patients, and each additional unit of packed red cell transfused conferred a 6% higher risk.
- Activation of Sensory Neurons Reduces Ischemia/Reperfusion-induced Acute Renal Injury in Rats** 361  
*Akio Mizutani, Kenji Okajima, Kazunori Murakami, Sachiko Mizutani, Kyosuke Kudo, Tetsuya Uchino, Yuji Kadoi, and Takayuki Noguchi*  
 Sensory neurons play a critical role in reducing ischemia/reperfusion-induced acute renal injury in rats by attenuating leukocyte activation through promotion of endothelial production of prostaglandin I<sub>2</sub>.
- Critical Closing Pressure as the Arterial Downstream Pressure with the Heart Beating and during Circulatory Arrest** 370  
*Eva Kottenberg-Assenmacher, Ivan Aleksic, Mareike Eckholt, Nils Lehmann, and Jürgen Peters*  
 Arterial critical closing pressure during arrest is predictable after  $\geq 7$  s, but is lower than calculated with the heart beating. Irrespective of the "true" critical closing pressure prevailing physiologically, it should be considered the arterial downstream pressure.
- **PAIN MEDICINE**
- 🌐 **Binding of Long-lasting Local Anesthetics to Lipid Emulsions** 380  
*Jean-Xavier Mazoit, Régine Le Guen, Hélène Beloeil, and Dan Benhamou*  
 Bupivacaine or ropivacaine binding to lipid emulsions is important: 100 ml of a 20%-Intralipid emulsion has the same capacity as the amount of albumin contained in 7–12 l of serum.  
 SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT
- Thiamine Suppresses Thermal Hyperalgesia, Inhibits Hyperexcitability, and Lessens Alterations of Sodium Currents in Injured, Dorsal Root Ganglion Neurons in Rats** 387  
*Xue-Song Song, Zhi-Jiang Huang, and Xue-Jun Song*  
 This study demonstrates new effects of thiamine on hyperexcitability and Na<sup>+</sup> currents in dorsal root ganglion neurons that have been altered by injury, and implicates novel mechanisms contributing to the analgesic effects of thiamine on neuropathic pain.
- $\alpha$ -1-Adrenergic Receptor Agonist Activity of Clinical  $\alpha$ -Adrenergic Receptor Agonists Interferes with  $\alpha$ -2-Mediated Analgesia** 401  
*Daniel W. Gil, Cynthia V. Cheevers, Karen M. Kedzie, Cynthia A. Manlapaz, Sandhya Rao, Elaine Tang, and John E. Donello*  
 $\alpha$ -1 receptor agonist activity interferes with  $\alpha$ -2 receptor-mediated analgesia. Greater  $\alpha$ -2 selectivity may enhance the therapeutic window of  $\alpha$ -2 agonists in the treatment of pain.

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## ■ REVIEW ARTICLES

### ◆◆ **Perioperative Glycemic Control: An Evidence-based Review** 408

*Angela K. M. Lipshutz and Michael A. Gropper*

Hyperglycemia in the perioperative period is associated with increased morbidity and mortality. Intensive insulin therapy has been shown to reduce morbidity and mortality in this period, but is associated with severe hypoglycemia and adverse events.

## ■ CLASSIC PAPERS REVISITED

### 🌐 **Glutamate, Microdialysis, and Cerebral Ischemia: Lost in Translation?** 422

*Helene Benveniste*

This article is a revisiting of original material published as: Benveniste H, Drejer J, Schousboe A, Diemer NH: Elevation of the extracellular concentrations of glutamate and aspartate in rat hippocampus during transient cerebral ischemia monitored by intracerebral microdialysis. *J Neurochem* 1984; 43:1369–74. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

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*Ian J. Smith, David A. Sidebotham, Alastair D. McGeorge, Edwin B. Dorman, Margaret L. Wilsher, and John Kolbe*

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**Innovative Thinking in the Care of Cardiac Surgical Patients**

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**INSTRUCTIONS FOR AUTHORS**

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