



## ◇ THIS MONTH IN ANESTHESIOLOGY

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## ◆ EDITORIAL VIEWS

### **Anesthetic Effects on the Developing Brain: Insights from Epidemiology**

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*Tom G. Hansen for the Danish Registry Study Group and Randall Flick for the Mayo Clinic Pediatric Anesthesia and Learning Disabilities Study Group*

### **In Search of Excellence in Anesthesiology**

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*Andrew Smith*

### **Laryngoscopy Force, Visualization, and Intubation Failure in Acute Trauma: Should We Modify the Practice of Manual In-line Stabilization?**

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*Seth Manoach and Lorenzo Paladino*

### **Why Obstetric Anesthesiologists Get Sued**

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*Barbara L. Leighton*

### **Filling in the Blanks**

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*David S. Warner*

## ■ SPECIAL ARTICLES

### ◆ **America's First Patented Series of Bubble-Through Anesthetic Vaporizers: Reverend Samuel J. Hayes' Sermons against Asphyxial Anesthesia**

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*George S. Bause*

Opposing the clinical use of 100% nitrous oxide, Rev. Dr. Samuel J. Hayes foot-pumped room air through America's first patented series of bubble-through anesthetic vaporizers to deliver "anesthesia, not asphyxia."

### **Practice Alert for the Perioperative Management of Patients with Coronary Artery Stents: A Report by the American Society of Anesthesiologists Committee on Standards and Practice Parameters**

22

The American Society of Anesthesiologists Committee on Standards and Practice Parameters presents a Practice Alert that reviews published recommendations addressing the perioperative management of surgical patients with recently implanted coronary artery stents. The intent of the Alert is to provide anesthesiologists with information about the increased risk of perioperative myocardial infarction and death in these patients, and the relationship between antiplatelet therapy and acute perioperative stent thrombosis.

## ■ PERIOPERATIVE MEDICINE

### ◆ **Manual In-line Stabilization Increases Pressures Applied by the Laryngoscope Blade during Direct Laryngoscopy and Orotracheal Intubation**

24

*Brandon G. Santoni, Bradley J. Hindman, Christian M. Puttlitz, Julie B. Weeks, Nathaniel Johnson, Mazen A. Maktabi, and Michael M. Todd*

Direct laryngoscopy and intubation conducted with manual in-line stabilization was associated with a doubling of pressure applied by the laryngoscope blade.

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### **Laryngoscopy *via* Macintosh Blade *versus* GlideScope: Success Rate and Time for Endotracheal Intubation in Untrained Medical Personnel**

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*Parichehr Nouruzi-Sedeh, Mark Schumann, and Harald Groeben*

The authors investigate the high success rate with the GlideScope technique performed by untrained medical personnel, as compared with direct laryngoscopy.

### **Rigid Laryngoscope-assisted Insertion of Transesophageal Echocardiography Probe Reduces Oropharyngeal Mucosal Injury in Anesthetized Patients**

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*SungWon Na, Chang Seok Kim, Ji Young Kim, Jin Seon Cho, and Ki Jun Kim*

Rigid laryngoscope-assisted insertion of the transesophageal echocardiography probe reduces the incidence of oropharyngeal mucosal injury.

### **Respiratory and Sleep Effects of Remifentanyl in Volunteers with Moderate Obstructive Sleep Apnea**

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*Christopher M. Bernards, Susan L. Knowlton, Douglas F. Schmidt, William J. DePaso, Matthias K. Lee, Susan B. McDonald, and Oneil S. Bains*

In patients with moderate obstructive sleep apnea, remifentanyl markedly impaired normal sleep architecture and significantly decreased obstructive apneas. However, remifentanyl markedly increased central apneas in a subset of patients.

### **Differential Effects of Propofol and Sevoflurane on Ischemia-induced Ventricular Arrhythmias and Phosphorylated Connexin 43 Protein in Rats**

50

*Naoyuki Hirata, Noriaki Kanaya, Noriko Kamada, Saori Kimura, and Akiyoshi Namiki*

Propofol and sevoflurane have differential effects on ischemia-induced arrhythmias *via* modulation of the autonomic nervous system and/or a principal gap junction protein, connexin 43.

### **Preoperative and Intraoperative Predictors of Cardiac Adverse Events after General, Vascular, and Urological Surgery**

58

*Sachin Kheterpal, Michael O'Reilly, Michael J. Englesbe, Andrew L. Rosenberg, Amy M. Shanks, Lingling Zhang, Edward D. Rothman, Darrell A. Campbell, and Kevin K. Tremper*

Analysis of 7,740 general surgery operations allowed the development of a cardiac adverse event risk model superior to current risk stratification techniques because of the inclusion of intraoperative variables.

### **◇ Preoperative Use of Statins Is Associated with Reduced Early Delirium Rates after Cardiac Surgery**

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*Rita Katznelson, George N. Djaiani, Michael A. Borger, Zeev Friedman, Susan E. Abbey, Ludwik Fedorko, Jacek Karski, Nicholas Mitsakakis, Jo Carroll, and W. Scott Beattie*

Preoperative statins administration is associated with a lower risk of postoperative delirium in cardiac surgery.

### **Effects of Propofol on Cyclic Strain-induced Endothelin-1 Expression in Human Umbilical Vein Endothelial Cells**

74

*Tzu-Hung Cheng, Jin-Jer Chen, Cheng-Hsien Chen, and Kar-Lok Wong*

The propofol-induced nitric oxide production and suppression of cyclic strain-induced endothelin-1 secretion in endothelial cells may contribute to the protective effects of propofol in the cardiovascular system.

*Continued on page 16A*

### **Glucose Infusion Suppresses Surgery-induced Muscle Protein Breakdown by Inhibiting Ubiquitin-proteasome Pathway in Rats**

81

*Mayumi Mikura, Ippei Yamaoka, Masako Doi, Yuichi Kawano, Mitsuo Nakayama, Reiko Nakao, Katsuya Hirasaka, Yuushi Okumura, and Takeshi Nikawa*

The present study demonstrates that glucose infusion, even at a relatively low rate, suppresses protein breakdown during the early postoperative period in rats. Glucose infusion down-regulates mRNA expression of atrogin-1/MAFbx and muscle ring finger-1.

### **Trends and Outcomes of Malignant Hyperthermia in the United States, 2000 to 2005**

89

*Eric B. Rosero, Adebola O. Adesanya, Carlos H. Timaran, and Girish P. Joshi*

Recent nationwide data suggest that the incidence and mortality of malignant hyperthermia in the United States are higher than previously reported.

### **Pharmacokinetic-Pharmacodynamic Model for the Reversal of Neuromuscular Blockade by Sugammadex**

95

*Bart A. Ploeger, Jean Smeets, Ashley Strougo, Henk-Jan Drenth, Ge Ruigt, Natalie Houwing, and Meindert Danhof*

Model-based evaluation is consistent with the hypothesis that the rapid reversal of rocuronium- and vecuronium-induced neuromuscular blockade by sugammadex results from a decrease in the free rocuronium and vecuronium concentrations in plasma and neuromuscular junction.

## ■ CRITICAL CARE MEDICINE

### **Midazolam Inhibits Tumor Necrosis Factor- $\alpha$ -induced Endothelial Activation: Involvement of the Peripheral Benzodiazepine Receptor**

106

*Hee Kyoung Joo, Sae Cheol Oh, Eun Jung Cho, Kyoung Sook Park, Ji Young Lee, Eun Ji Lee, Sang Ki Lee, Hyo Shin Kim, Jin Bong Park, and Byeong Hwa Jeon*

These results suggest that midazolam has an inhibitory action on the endothelial activation, and that its action is related to the activation of peripheral benzodiazepine receptor localized in mitochondria of the endothelial cells.

### **◆ Prevention of the Pulmonary Vasoconstrictor Effects of HBOC-201 in Awake Lambs by Continuously Breathing Nitric Oxide**

113

*Binglan Yu, Gian Paolo Volpato, Keqin Chang, Kenneth D. Bloch, and Warren M. Zapol*

Pretreatment with inhaled nitric oxide followed by continuous breathing of a low concentration of nitric oxide prevents systemic and pulmonary vasoconstriction induced by HBOC-201 administration in sheep without causing methemoglobinemia.

### **CU-2010—A Novel Small Molecule Protease Inhibitor with Antifibrinolytic and Anticoagulant Properties**

123

*Wulf Dietrich, Silke Nicklisch, Andreas Koster, Michael Spannagl, Helmut Giersiefen, and Andreas van de Locht*

CU-2010 is a novel synthetic protease inhibitor with antifibrinolytic potency comparable to aprotinin; it is more potent than tranexamic acid and has anticoagulant properties.

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## ■ PAIN MEDICINE

### ◆◆ **Liability Associated with Obstetric Anesthesia: A Closed Claims Analysis** 131

*Joanna M. Davies, Karen L. Posner, Lorri A. Lee, Frederick W. Cheney, and Karen B. Domino*

Obstetric anesthesia claims for injuries from 1990 to 2003 were compared with obstetric claims for injuries prior to 1990. Compared with pre-1990 obstetric claims, the proportion of maternal death and newborn death/brain damage decreased, whereas maternal nerve injury and maternal back pain increased. Although newborn death/brain damage decreased, it yet remains a leading cause of obstetric anesthesia malpractice claims over time. Potentially preventable anesthetic causes of newborn injury included delays in anesthesia care and poor communication between the obstetrician and anesthesiologist.

### **Expression Profile of Nerve Growth Factor after Muscle Incision in the Rat** 140

*Chaoan Wu, Mark A. Erickson, Jun Xu, Kenneth D. Wild, and Timothy J. Brennan*

Nerve growth factor is produced by fibroblasts and contributes to muscle incisional pain.

### **Comparison of Continuous Infusion *versus* Automated Bolus for Postoperative Patient-controlled Analgesia with Popliteal Sciatic Nerve Catheters** 150

*Manuel Taboada, Jaime Rodríguez, Maria Bermudez, Marcos Amor, Beatriz Ulloa, Francisco Aneiros, Sergi Sebaste, Joaquin Cortés, Julian Alvarez, and Peter G. Atanassoff*

In continuous popliteal block, local anesthetic administered as automated regular bolus combined with patient-controlled analgesia provided similar pain relief and lowered consumption of local anesthetic when compared to a continuous infusion combined with patient-controlled analgesia.

### **Activation of p38 Mitogen-activated Protein Kinase in Spinal Microglia Contributes to Incision-induced Mechanical Allodynia** 155

*Yeong-Ray Wen, Marc R. Suter, Ru-Rong Ji, Geng-Chang Yeh, Yen-Sheng Wu, Kuo-Ching Wang, Tatsuro Kohno, Wei-Zen Sun, and Chia-Chuan Wang*

Incision-induced mechanical allodynia is partially attributed to p38 activation in spinal microglia and can be prevented by p38 inhibitor. These suggest p38 activation participates in the development of incision-induced mechanical allodynia in rats.

## ■ REVIEW ARTICLES

### **Modulation of Opioid Actions by Nitric Oxide Signaling** 166

*Noboru Toda, Shiroh Kishioka, Yoshio Hatano, and Hiroshi Toda*

Endogenously formed nitric oxide either enhances or reduces antinociception by opioids acting on supraspinal, spinal, and peripheral sites. Tolerance to and dependence on morphine or its withdrawal syndrome are prevented by nitric oxide synthase inhibition.

## ■ CLINICAL CONCEPTS AND COMMENTARY

### **Infectious Risk of Continuous Peripheral Nerve Blocks** 182

*Xavier Capdevila, Sophie Bringuier, and Alain Borgeat*

Risk factors related to inflammation during continuous peripheral nerve blocks are catheter duration, no antibiotic prophylaxis, frequent dressing change, intensive care unit patients, and axillary or femoral catheter sites.

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### **Acute Airway Obstruction Caused by the New Single Use Laryngeal Mask Airway Supreme™** 189

*Maren Kleine-Brueggeney, Lorenz G. Theiler, Cedric Luyet, and Robert Greif*

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### INSTRUCTIONS FOR AUTHORS

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