



## ON THE COVER:

This month's issue includes two articles highlighting very different approaches to coordination of preoperative assessment and an editorial about why multiple solutions are needed in the real world. The cover art depicts the role described by the editorialist of the anesthesiologist as the best-placed individual to direct the multiple pieces of information, testing and consultation needed to determine the path forward to surgery.

- Newman *et al.*: The Evolution of Anesthesiology and Perioperative Medicine, p. 1005
- Thilen *et al.*: Patterns of Preoperative Consultation and Surgical Specialty in an Integrated Healthcare System, p. 1028
- Phillips *et al.*: Global Health Implications of Preanesthesia Medical Examination for Ophthalmic Surgery, p. 1038

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### Targeting Purinergic Signaling for Perioperative Organ Protection

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### The Evolution of Anesthesiology and Perioperative Medicine

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### Trust, but Verify: Examining the Role of Observational Data in Perioperative Decision-making

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## SPECIAL ARTICLES

### Military Anesthesia Trainees in WWII at the University of Wisconsin: Their Training, Careers, and Contributions

Colby L. Parks and Mark E. Schroeder

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During World War II, military physicians received anesthesia training at academic institutions across the country. Ralph Waters and the Wisconsin General Hospital anesthesia department trained 17 officers, many of whom went on to productive careers in anesthesiology.

◇ Refers to This Month in Anesthesiology

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CME CME Article

## ■ PERIOPERATIVE MEDICINE

- ◆ **Patterns of Preoperative Consultation and Surgical Specialty in an Integrated Healthcare System** 1028

*Stephan R. Thilen, Christopher L. Bryson, Robert J. Reid, Duminda N. Wijeyesundera, Edward M. Weaver, and Miriam M. Treggiari*

There is substantial practice variation among surgical specialties with regard to the use of preoperative consultations and these are frequently provided for patients with low cardiac risk presenting for low-risk surgeries.

- ◆ **Global Health Implications of Preanesthesia Medical Examination for Ophthalmic Surgery** 1038

*Michael B. Phillips, Rick E. Bendel, Julia E. Crook, and Nancy N. Diehl*

Ophthalmic preanesthesia medical examination frequently detects new or unstable medical conditions, which do not typically alter perioperative procedures. However, these conditions are relevant to long-term health and should be conveyed to primary care physicians for further evaluation.

- CME ◆ **Perioperative Comparative Effectiveness of Anesthetic Technique in Orthopedic Patients** 1046

*Stavros G. Memtsoudis, Xuming Sun, Ya-Lin Chiu, Ottokar Stundner, Spencer S. Liu, Samprit Banerjee, Madhu Mazumdar, and Nigel E. Sharrock*

The impact of anesthetic technique on perioperative outcomes remains controversial. Analyzing a large national sample, the authors demonstrate superior postoperative outcomes associated with the utilization of neuraxial *versus* general anesthesia for primary joint arthroplasty.

- ◆ **Retrograde Light-guided Laryngoscopy for Tracheal Intubation: Clinical Practice and Comparison with Conventional Direct Laryngoscopy** 1059

*Tao Yang, Jiong Hou, Jinbao Li, Xu Zhang, Xiaoyan Zhu, Wen Ni, Yanfei Mao, and Xiaoming Deng*

Retrograde light-guided laryngoscopy for tracheal intubation uses transtracheal light transmission from a source attached to the skin to illuminate the glottis. Nine residents, six medical students and five nurses who had never intubated a patient each attempted to intubate 10 patients, using direct laryngoscopy in five of them and retrograde light-guided laryngoscopy in five in a randomly assigned order. The overall success rate using direct laryngoscopy was 47% while that with retrograde light-guided laryngoscopy was 72%. The median cumulative times to glottis exposure and to tracheal intubation were decreased and glottic exposure was improved when retrograde light-guided laryngoscopy was used.

- ◆ **Isoflurane Regulates Atypical Type-A  $\gamma$ -Aminobutyric Acid Receptors in Alveolar Type II Epithelial Cells** 1065

*Yun-Yan Xiang, Xuanmao Chen, Jingxin Li, Shuanglian Wang, Gil Faclier, John F. MacDonald, James C. Hogg, Beverley A. Orser, and Wei-Yang Lu*

Isoflurane increases the activity of  $\gamma$ -aminobutyric acid type A receptors in human alveolar type II epithelial cells and reduces the expression of cyclooxygenase-2 in these cells by regulating these receptors.

- Involvement of the Tyr Kinase/JNK Pathway in Carbachol-induced Bronchial Smooth Muscle Contraction in the Rat** 1076

*Hiroyasu Sakai, Yu Watanabe, Mai Honda, Rika Tsuiki, Yusuke Ueda, Yuki Nagai, Minoru Narita, Miwa Misawa, and Yoshihiko Chiba*

The aim of the current study was to investigate the involvement of the Tyr kinase pathway in the contraction of bronchial smooth muscle. The Tyr kinase/JNK pathway may play a role in bronchial smooth muscle contraction.

- Early Exposure to General Anesthesia Disturbs Mitochondrial Fission and Fusion in the Developing Rat Brain** 1086

*Annalisa Boscolo, Desanka Milanovic, John A. Starr, Victoria Sanchez, Azra Oklopacic, Laurie Moy, Carlo Ori C, Alev Erisir, and Vesna Jevtovic-Todorovic*

General anesthesia impairs the fine balance between mitochondrial fusion and fission, leading to acute mitochondrial fragmentation. The mechanism involves sequestration and polymerization of fission protein, Drp-1 and downregulation of fusion protein, Mfn-2.

**Surgery Results in Exaggerated and Persistent Cognitive Decline in a Rat Model of the Metabolic Syndrome** 1098

*Xiaomei Feng, Vincent Degos, Lauren G. Koch, Steven L. Britton, Yinggang Zhu, Susana Vacas, Niccolò Terrando, Jeffrey Nelson, Xiao Su, and Mervyn Maze*

Rats with Metabolic Syndrome have exaggerated memory decline in the immediate postoperative period. Also, postoperative Metabolic Syndrome rats have long-lasting learning and memory dysfunction that persists for no less than 5 months.

**Magnetic Resonance Imaging Analysis of the Spread of Local Anesthetic Solution after Ultrasound-guided Lateral Thoracic Paravertebral Blockade: A Volunteer Study** 1106

*Daniela Marhofer, Peter Marhofer, Stephan C. Kettner, Edith Fleischmann, Daniela Prayer, Melanie Schernthaner, Edith Lackner, Harald Willschke, Pascal Schwetz, and Markus Zeitlinger*

The authors investigated the spread of local anesthetic after thoracic paravertebral blockade *via* magnetic resonance imaging. Whereas the spread was constant with approximately four vertebral levels, the sensory distribution was within a wide range.

**Postoperative Recovery with Bispectral Index *versus* Anesthetic Concentration-guided Protocols** 1113

*Bradley A. Fritz, Preetika Rao, George A. Mashour, Arbi ben Abdallah, Beth A. Burnside, Eric Jacobsohn, Lini Zhang, and Michael S. Avidan*

Use of a bispectral index-guided anesthetic protocol did not lead to faster recovery or decreased incidence of nausea, vomiting, or pain, compared with an end-tidal anesthetic concentration-guided protocol.

**Neuroprotective Effects of Dexmedetomidine against Glutamate Agonist-induced Neuronal Cell Death Are Related to Increased Astrocyte Brain-derived Neurotrophic Factor Expression** 1123

*Vincent Degos, Tifenn Le charpentier, Vibol Chhor, Olivier Brissaud, Sophie Lebon, Leslie Schwendimann, Nathalie Bednareck, Sandrine Passemard, Jean Mantz, and Pierre Gressens*

The authors' study showed that dexmedetomidine neuroprotective effects are mediated by brain-derived neurotrophic factor modulation in perinatal brain injury. Dexmedetomidine increased astrocyte expression of brain-derived neurotrophic factor through extracellular signal regulated kinase-dependent pathway.

**Operating Room Fires: A Closed Claims Analysis** 1133

*Sonya P. Mehta, Sanjay M. Bhananker, Karen L. Posner, and Karen B. Domino*

Electrocautery-induced fires during monitored anesthesia care were the most common cause of operating room fire claims. Supplemental oxygen by an open delivery system served as the oxidizer in nearly all of the fires.

■ CRITICAL CARE MEDICINE

**Activation of Triggering Receptor Expressed on Myeloid Cells-1 Protects Monocyte from Apoptosis through Regulation of Myeloid Cell Leukemia-1** 1140

*MeiTing Cai, QiXing Chen, Chi Chen, XiWang Liu, JinChao Hou, CongLi Zeng, Qiang Shu, and XiangMing Fang*

TREM-1 protected monocytes from apoptosis through activation of both Erk and Akt pathways and increased expression of Mcl-1 protein. TREM-1 levels were inversely correlated to the magnitude of apoptosis in monocytes in septic patients.

◆ **Impact of the Prone Position in an Animal Model of Unilateral Bacterial Pneumonia Undergoing Mechanical Ventilation** 1150

*Sylvain Ladoire, Laure-Anne Pauchard, Saber-Davide Barbar, Pierre Tissieres, Delphine Croisier-Bertin, and Pierre-Emmanuel Charles*

Mechanical ventilation promotes tissue damages and inflammation if applied to preinjured lungs, worsening in turn bacterial pneumonia. Prone position improved bacterial clearance, decreased injury and inflammatory mediators release as well in ventilated rabbits.

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*Delia Aguado, Mariana Abreu, Javier Benito, Javier Garcia-Fernandez, and Ignacio A. Gómez de Segura*

An ultra-low dose of naloxone blocked remifentanyl-induced hyperalgesia and the associated minimum alveolar concentration increase but did not change opioid tolerance under inhalant anesthesia.

#### **Predicting Acute Pain after Cesarean Delivery Using Three Simple Questions** 1170

*Peter H. Pan, Ashley M. Tonidandel, Carol A. Aschenbrenner, Timothy T. Houle, Lynne C. Harris, and James C. Eisenach*

A three-item preoperative screening questionnaire in assessing anxiety, anticipated postcesarean pain and analgesic need provides a meaningful parsimonious combination of predictors that reliably yields a validated predictive model accounting for 20% of the variance in postcesarean pain.

#### **Treatment with Carbon Monoxide-releasing Molecules and an HO-1 Inducer Enhances the Effects and Expression of $\mu$ -Opioid Receptors during Neuropathic Pain** 1180

*Arnau Hervera, Sergi Leáñez, Roberto Motterlini, and Olga Pol*

Carbon monoxide-releasing molecules or inducible heme oxygenase inducer treatments enhance the local antinociceptive effects of morphine during neuropathic pain through enhancing  $\mu$ -opioid receptors peripheral expression and inhibiting microglial activation and neuronal/inducible nitric oxide synthases overexpression.

### ■ EDUCATION

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#### ◆ **Anesthesia for *In Utero* Repair of Myelomeningocele** 1211

*Marla Ferschl, Robert Ball, Hanmin Lee, and Mark D. Rollins*

Fetal myelomeningocele repair may be preferable to postnatal repair. The pathophysiology of myelomeningocele and anesthetic management of open fetal myelomeningocele surgery are discussed. The success of this unique procedure relies on a well-coordinated multidisciplinary approach.

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