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**Reporting the Results of a Study That Did Not Go According to Plan** 957  
*Timothy T. Houle*

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**Etanercept: An Epidural Steroid Alternative for Minimally Invasive Treatment of Radiculitis** 967  
*Marc A. Huntoon*

■ PERIOPERATIVE MEDICINE

◆◆ **Continuous Perioperative Insulin Infusion Decreases Major Cardiovascular Events in Patients Undergoing Vascular Surgery: A Prospective, Randomized Trial** 970  
*Balachundhar Subramaniam, Peter J. Panzica, Victor Novack, Feroze Mahmood, Robina Matyal, John D. Mitchell, Eswar Sundar, Ruma Bose, Frank Pomposelli, Judy R. Kersten, and Daniel S. Talmor*

Continuous infusion of insulin in hyperglycemic patients undergoing vascular surgery, with or without diabetes, substantially reduces perioperative myocardial infarction compared with intermittent insulin bolus therapy.

◆◆ **Reduction in Intraoperative Bacterial Contamination of Peripheral Intravenous Tubing Through the Use of a Novel Device** 978  
*Matthew D. Koff, Randy W. Loftus, Corey C. Burchman, Joseph D. Schwartzman, Megan E. Read, Elliot S. Henry, and Michael L. Beach*

Improvements in intraoperative aseptic practice of anesthesia providers through the provision of a novel device reduces stopcock contamination and subsequent development of 30-day postoperative infections.

◆ **Neuronal Preconditioning by Inhalational Anesthetics: Evidence for the Role of Plasmalemmal Adenosine Triphosphate-sensitive Potassium Channels** 986  
*Carsten Bantel, Mervyn Maze, and Stefan Trapp*

Xenon and sevoflurane precondition neuronal-glial cocultures against damage induced by oxygen-glucose deprivation. The effect of xenon required opening of plasmalemmal adenosine triphosphate-sensitive potassium channels. Xenon, but not sevoflurane, isoflurane, or halothane, activated plasmalemmal adenosine triphosphate-sensitive potassium channels in HEK293 cells expressing Kir6.2/SUR1.

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- ◆ **Volatile Anesthetic Action in a Computational Model of the Thalamic Reticular Nucleus** 996  
*Allan Gottschalk and Sam A. Miotke*  
 Volatile anesthetic modulation of T-type  $\text{Ca}^{2+}$  channels and  $\gamma$ -aminobutyric acid type A receptors was examined in a computer model of the thalamic reticular nucleus. Isobolographic analysis demonstrates how these effects combine to modulate network activity.
- Resistance to D-Tubocurarine of the Rat Diaphragm as Compared to a Limb Muscle: Influence of Quantal Transmitter Release and Nicotinic Acetylcholine Receptors** 1011  
*Tu Nguyen-Huu, Jordi Molgó, Denis Servent, and Philippe Duvaldestin*  
 Resistance of diaphragm to D-tubocurarine in rats can be explained by both increased acetylcholine release and the number of nicotinic acetylcholine receptors binding sites at the neuromuscular junction.
- Influence of Disease Progression on the Neuromuscular Blocking Effect of Mivacurium in Children and Adolescents with Duchenne Muscular Dystrophy** 1016  
*Harald Ihmsen, Joachim Schmidt, Helmut Schwilden, Hubert J. Schmitt, and Tino Muenster*  
 In patients with Duchenne muscular dystrophy, the neuromuscular blocking effect of mivacurium is significantly dependent on the progression of the disease.
- Reversal of Profound Neuromuscular Block by Sugammadex Administered Three Minutes: A Comparison with Spontaneous Recovery from Succinylcholine** 1020  
*Chingmuh Lee, Jonathan S. Jahr, Keith A. Candiotti, Brian Warriner, Mark H. Zornow, and Mohamed Naguib*  
 Reversal of neuromuscular block with sugammadex administered 3 min after rocuronium is significantly faster than spontaneous recovery from succinylcholine and is well tolerated. Sugammadex may have utility when immediate restoration of neuromuscular function is required.
- Influence of Auditory Stimulation Rates on Evoked Potentials during General Anesthesia: Relation between the Transient Auditory Middle-latency Response and the 40-Hz Auditory Steady State Response** 1026  
*Richard R. McNeer, Jorge Bohórquez, and Özcan Özdamar*  
 The 40-Hz auditory steady state response is shown to represent a composite of 40-Hz auditory middle-latency response in patients during general anesthesia.
- Effect of Flumazenil on Bispectral Index Monitoring in Unpremedicated Patients** 1036  
*Ashraf A. Dahaba, Helmar Bornemann, Peter H. Rehak, Geng Wang, Xin Min Wu, and Helfried Metzler*  
 This study demonstrates that flumazenil administered to unpremedicated patients during propofol/remifentanyl anesthesia significantly increased the bispectral index value and allowed earlier emergence from anesthesia; this could be useful for reversing endogenous or exogenous endozepines during anesthesia.
- Lidocaine Protects from Myocardial Damage due to Ischemia and Reperfusion in Mice by Its Antiapoptotic Effects** 1041  
*Dominik J. Kaczmarek, Christine Herzog, Jan Larmann, Hans-Jörg Gillmann, Reinhard Hildebrand, Martina Schmitz, Anik Westermann, Thomas Harendza, Robert Werdehausen, Alexander W. Osthaus, Frank Echtermeyer, Klaus Hahnenkamp, Kai C. Wollert, and Gregor Theilmeier*  
 Lidocaine exerts cardioprotective effects *in vivo* when administered before or after an ischemic myocardial insult. This effect is mediated through an antiapoptotic pathway, not through an antiinflammatory pathway, and it may be therapeutically exploitable.

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**Individual Probability of Allogeneic Erythrocyte Transfusion in Elective Spine Surgery: The Predictive Model of Transfusion in Spine Surgery** 1050

*Brigitte Lenoir, Paul Merckx, Catherine Paugam-Burtz, Cyril Dauzac, Marie-Madeleine Agostini, Pierre Guigui, and Jean Mantz*

The authors developed a predictive score of the individual probability of transfusion in patients undergoing elective thoracolumbar spine surgery (age > 50 yr, preoperative hemoglobin level < 12 g/dl, fusion of more than two levels, and transpedicular osteotomy).

**Systematic Review of Questionnaires Measuring Patient Satisfaction in Ambulatory Anesthesia** 1061

*Pratamaporn Chanthong, Amir Abrishami, Jean Wong, Francisco Herrera, and Frances Chung*

This systematic review evaluated questionnaires for measuring patient satisfaction in ambulatory anesthesia services. Two questionnaires fulfilled the criteria for good psychometric construction, but they were not developed specifically for ambulatory anesthesia.

**Postoperative Neurocognitive Dysfunction in Elderly Patients after Xenon versus Propofol Anesthesia for Major Noncardiac Surgery: A Double-blinded Randomized Controlled Pilot Study** 1068

*Jan Höcker, Claudia Stapelfeldt, Jörn Leidecker, Patrick Meybohm, Robert Hanss, Jens Scholz, and Berthold Bein*

Compared to propofol, xenon did not reduce postoperative cognitive deficit 1, 6, and 30 days after anesthesia in elderly patients undergoing major noncardiac surgery.

**Dexmedetomidine Attenuates Isoflurane-induced Neurocognitive Impairment in Neonatal Rats** 1077

*Robert D. Sanders, Jing Xu, Yi Shu, Adam Januszewski, Sunil Halder, Antonio Fidalgo, Pamela Sun, Mahmuda Hossain, Daqing Ma, and Mervyn Maze*

Isoflurane administration to neonatal rats induces apoptosis and long-term neurocognitive dysfunction. Treatment with dexmedetomidine attenuated the apoptotic injury, assessed by caspase-3 expression, and ameliorated the cognitive dysfunction induced by isoflurane.

■ **CRITICAL CARE MEDICINE**

◇ **4G/5G Polymorphism of Plasminogen Activator Inhibitor -1 Gene Is Associated with Mortality in Intensive Care Unit Patients with Severe Pneumonia** 1086

*Anil Sapru, Helen Hansen, Temitayo Ajayi, Ron Brown, Oscar Garcia, HanJing Zhuo, Joseph Wiemels, Michael A. Matthay, and Jeanine Wiener-Kronish*

The 4G allele of the 4G/5G polymorphism of the plasminogen activator inhibitor-1 (PAI-1) gene is associated with an increased incidence of hospitalizations for pneumonia. The authors hypothesized that the 4G allele would be associated with worse clinical outcomes in patients with severe pneumonia. Patients admitted to the hospital with severe pneumonia were enrolled in a prospective cohort study and were followed until discharge. The 4G allele of the 4G/5G polymorphism in the PAI-1 gene was associated with fewer ventilator-free days and increased mortality in hospitalized patients with severe pneumonia. These findings suggest that PAI-1 may have a role in pathogenesis and that the 4G/5G polymorphism may be an important biomarker of risk in patients with severe pneumonia.

🌐 **Influence of Respiratory Rate on Stroke Volume Variation in Mechanically Ventilated Patients** 1092

*Daniel De Backer, Fabio Silvio Saccone, Roland Holsten, Fayssal Ibrahim, and Jean-Louis Vincent*

Right and left indices of ventricular preload variation can be dissociated at high respiratory rate. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

*Continued on page 16A*

**Does a Higher Positive End Expiratory Pressure Decrease Mortality in Acute Respiratory Distress Syndrome? A Systematic Review and Meta-analysis** 1098

*Susan I. Phoenix, Sharath Paravastu, Malachy Columb, Jean-Louis Vincent, and Mahesh Nirmalan*

This meta-analysis shows that the use of high positive end expiratory pressure (>10 cm H<sub>2</sub>O), when employed within a protective ventilation strategy, may have an independent clinically relevant mortality benefit in patients with acute respiratory distress syndrome.

**Prediction of Neurological Outcome Using Bispectral Index Monitoring in Patients with Severe Ischemic-Hypoxic Brain Injury Undergoing Emergency Surgery** 1106

*Paul S. Myles, David Daly, Andrew Silvers, and Sesto Cairo*

Bispectral index monitoring may predict poor outcome in patients with severe ischemic-hypoxic brain injury undergoing emergency surgery.

■ PAIN MEDICINE

◆◆ **Randomized, Double-blind, Placebo-controlled, Dose-response, and Preclinical Safety Study of Transforaminal Epidural Etanercept for the Treatment of Sciatica** 1116

*Steven P. Cohen, Nikolai Bogduk, Anthony Dragovich, Chester C. Buckenmaier III, Scott Griffith, Connie Kurihara, JoLynne Raymond, Philip J. Richter, Necia Williams, and Tony L. Yaksh*

This randomized, controlled study evaluating epidural etanercept demonstrated benefits over placebo. No evidence of toxicity was found in humans or animals.

**Lidocaine Concentration in Cerebrospinal Fluid after Epidural Administration: A Comparison between Epidural and Combined Spinal–Epidural Anesthesia** 1127

*Yoshinori Kamiya, Tatsuaki Kikuchi, Gaku Inagawa, Hiroshi Miyazaki, Masashi Miura, Satoshi Morita, and Takahisa Goto*

Meningeal puncture of spinal anesthesia preceding the epidural component of combined spinal–epidural anesthesia, with probable spread of local anesthetic from the epidural to subarachnoid space, resulted in similar cerebrospinal fluid lidocaine concentrations as epidural anesthesia alone.

**Opioid Tolerance Blunts the Reduction in the Sevoflurane Minimum Alveolar Concentration Produced by Remifentanil in the Rat** 1133

*Ignacio A. Gómez de Segura, Javier Benito de la Vibora, and Delia Aguado*

Remifentanil reduces the sevoflurane minimum alveolar concentration in the rat. However, acute opioid tolerance quickly develops and blunts this reduction, so higher remifentanil doses are needed to reach the initial minimum alveolar concentration reduction.

■ REVIEW ARTICLES

**Postoperative Urinary Retention: Anesthetic and Perioperative Considerations** 1139

*Gabriele Baldini, Hema Bagry, Armen Aprikian, and Franco Carli*

The pathophysiology, clinical assessment, and management of postoperative urinary retention are reviewed.

🌐 **Quality and Safety Indicators in Anesthesia: A Systematic Review** 1158

*Guy Haller, Johannes Stoelwinder, Paul S. Myles, and John McNeil*

This systematic review identifies, describes, and assesses existing clinical indicators for quality and safety measurement in anesthesia.

SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

## ■ CLINICAL CONCEPTS AND COMMENTARY

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### **Perioperative Drug Therapy in Elderly Patients** 1176

*Richard Rivera and Joseph F. Antognini*

Elderly patients have decreased reserves and altered responses to drugs used perioperatively. These patients are often volume depleted and are sensitive to anesthetics, opioids, and muscle relaxants. Reduced doses and careful titration can minimize side effects.

## ■ CASE REPORTS

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### **Not All Swelling Is Edema in Eclampsia: A Rare and Life-threatening Potential Complication of Eclamptic Seizures** 1183

*Hale Aksu, Terrence Bogard, and Peter H. Pan*

### **Cardiopulmonary Resuscitation in the Lateral Position: Is It Feasible during Pediatric Intracranial Surgery?** 1185

*Mary Abraham, Manju Wadhawan, Vikas Gupta, and Anil K. Singh*

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### **Antiinflammatory Effect of Peripheral Nerve Blockade** 1189

*Dermot R. O' Donnell, Arun Prasad, and Richard Brull*

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### **Multiplane Reconstruction Is Better Than Plain X-ray to Measure the Tracheobronchial Tree** 1189

*Marc Fischler and Pierre-Antoine Laloë*

### **Modified and Newly Designed Right-sided Double-lumen Endobronchial Tubes Are Complementary**

*Jean S. Bussièrès and Jacques Somma*

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### **Infection Control Practices by the Anesthesiologist** 1191

*Steven M. Neustein and Robert Williams*

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### **Increased Impedance on Nerve Stimulator Display May Actually Reflect a Decrease in Total System Impedance** 1192

*Phillip C. Cory*

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### **Nitrous Oxide: A Global Toxicological Effect to Consider** 1195

*Nathaniel W. Parker and Elizabeth C. Behringer*

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#### INSTRUCTIONS FOR AUTHORS

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