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James P. Rathmell and Matthew J. Miller

■ SPECIAL ARTICLES

Development of a System for the Evaluation of the Teaching Qualities of Anesthesiology Faculty

709

Kiki M. J. M. H. Lombarts, Martin J. L. Bucx, and Onyebuchi A. Arah

A valid, reliable, and feasible system for the evaluation of teaching qualities of anesthesiology faculty in an academic medical center was developed and tested, including instruments for residents' evaluations of faculty and faculty self-evaluations.

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◇ Refers to This Month in Anesthesiology

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CME CME Article

■ PERIOPERATIVE MEDICINE

- ◆ **Effect of β -blocker Prescription on the Incidence of Postoperative Myocardial Infarction after Hip and Knee Arthroplasty** 717
Wilton A. van Klei, Gregory L. Bryson, Homer Yang, and Alan J. Forster
 Investigators evaluated the effect of perioperative β -blockade on postoperative myocardial infarction (POMI) in low-risk patients undergoing elective hip or knee arthroplasty between 2002 and 2006. Propensity analysis and logistic regression were used to determine the independent association of β -blocker exposure on POMI. Nine hundred arthroplasty patients were treated with β -blockers on the day of surgery. After adjustment for confounders, discontinuation of β -blocker prescription during the first week after surgery was significantly associated with POMI and death.
- ◆ **Basal Forebrain Histaminergic Transmission Modulates Electroencephalographic Activity and Emergence from Isoflurane Anesthesia** 725
Tao Luo and L. Stan Leung
 Microinfusion of histamine into the basal forebrain induced electroencephalographic activation, increased respiratory rate, and accelerated emergence from isoflurane anesthesia *via* activating the H1 receptor, suggesting a role of the basal forebrain histaminergic pathway in modulating arousal/emergence from anesthesia.
- ◆ **A Population-based Analysis of Outpatient Colonoscopy in Adults Assisted by an Anesthesiologist** 734
Othman Alharbi, Linda Rabeneck, Lawrence F. Paszat, Duminda N. Wijesundera, Rinku Sutradhar, Lingsong Yun, Christopher M. Vinden, and Jill Timmouth
 This population-based study demonstrates the increased use of anesthesiologist services for colonoscopy. Anesthesiologist-assisted colonoscopy is more common in low-volume community hospitals and when a surgeon is performing the procedure.
- 🌐 **Nitrous Oxide Plus Isoflurane Induces Apoptosis and Increases β -Amyloid Protein Levels** 741
Yu Zhen, Yuanlin Dong, Xu Wu, Zhipeng Xu, Yan Lu, Yiyang Zhang, David Norton, Ming Tian, Shuren Li, and Zhongcong Xie
 Nitrous oxide (70%) plus 1% isoflurane induces apoptosis and increases β -amyloid protein levels *in vitro*. Pending *in vivo* confirmation, these results suggest that nitrous oxide plus isoflurane may cause neurotoxicity. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT
- Hemodynamic Effects of Ephedrine, Phenylephrine, and the Coadministration of Phenylephrine with Oxytocin during Spinal Anesthesia for Elective Cesarean Delivery** 753
Robert A. Dyer, Anthony R. Reed, Dominique van Dyk, Michelle J. Arcache, Owen Hodges, Carl J. Lombard, Jaime Greenwood, and Michael F. James
 Bolus phenylephrine produced an absolute reduction in maternal cardiac output and decreased cardiac output when compared with ephedrine during elective spinal anesthesia for Cesarean delivery. Coadministered phenylephrine obtunded hemodynamic responses to oxytocin.
- Amnestic Concentrations of Etomidate Modulate GABA_{A,slow} Synaptic Inhibition in Hippocampus** 766
Shuiping Dai, Misha Perouansky, and Robert A. Pearce
 Concentrations of etomidate that impair hippocampal-dependent memory prolonged the decay of slow but not fast inhibitory currents in the dendrites of hippocampal pyramidal neurons. This effect may be instrumental in producing anesthetic-induced amnesia.

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γ -Amino Butyric Acid Type A Receptor Mutations at β 2N265 Alter Etomidate Efficacy While Preserving Basal and Agonist-dependent Activity

774

Rooma Desai, Dirk Ruesch, and Stuart A. Forman

γ -Aminobutyric acid type A receptor mutations β 2(N265S) and β 2(N265M) or replacement of β 2 with β 1 subunits affect etomidate efficacy much more than binding affinity.

Operation Timing Does Not Affect Outcome after Coronary Artery Bypass Graft Surgery

785

Paul J. Tan, Meng Xu, Daniel I. Sessler, and C. Allen Bashour

Hour, day of the week, month, and moon phase do not affect the outcome after coronary artery bypass grafting.

Response Surface Modeling of the Interaction between Propofol and Sevoflurane

790

Peter M. Schumacher, Jan Dossche, Eric P. Mortier, Martin Luginbuehl, Thomas W. Bouillon, and Michel M. R. F. Struys

The investigated interaction of propofol and sevoflurane was found to be additive for electroencephalographic and tolerance of stimulation endpoints. Full response surfaces were identified for all endpoints with small standard errors for all structural parameters. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

Early Phase Pharmacokinetics but Not Pharmacodynamics Are Influenced by Propofol Infusion Rate

805

Kenichi Masui, Marimo Kira, Tomiei Kazama, Satoshi Hagihira, Eric P. Mortier, and Michel M. R. F. Struys

Propofol early phase kinetics and dynamics are appropriately described when using an enlarged two-compartmental model influenced by infusion rate and a sigmoidal E_{\max} model with a time delay of the applied Bispectral Index values. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

Epidural Cooling Minimizes Spinal Cord Injury after Aortic Cross-clamping through Induction of Nitric Oxide Synthase

818

Akiko Ishikawa, Atsuo Mori, Nobuyuki Kabei, Akihiro Yoshitake, Takeshi Suzuki, Nobuyuki Katori, Hiroshi Morisaki, Ryohei Yozu, and Junzo Takeda

This study demonstrates in a porcine model that regional epidural cooling during aortic cross-clamping minimized the risk of paraplegia, possibly through induction of nitric oxide synthase and prevention of delayed hypoperfusion to spinal cord.

CRITICAL CARE MEDICINE

Tidal Volume Lower than 6 ml/kg Enhances Lung Protection: Role of Extracorporeal Carbon Dioxide Removal

826

Pier Paolo Terragni, Lorenzo Del Sorbo, Luciana Mascia, Rosario Urbino, Erica L. Martin, Alberto Birocco, Chiara Faggiano, Michael Quintel, Luciano Gattinoni, and V. Marco Ranieri

Tidal volume lower than 6 ml/kg minimizes ventilator-induced lung injury when plateau pressure ranges between 28 and 30 cm H₂O; extracorporeal carbon dioxide removal may manage consequent respiratory acidosis. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

◆◆ **Mechanical Ventilation Induces a Toll/Interleukin-1 Receptor Domain-containing Adapter-inducing Interferon β -dependent Inflammatory Response in Healthy Mice** 836

Michiel Vaneker, Leo M. A. Heunks, Leo A. Joosten, Hieronymus W. H. van Hees, Dirk G. Srijdelaar, Feico J. Halbertsma, Jan van Egmond, Mihai G. Netea, Johannes G. van der Hoeven, and Gert Jan Scheffer

The inflammatory response after mechanical ventilation is Toll/interleukin-1 receptor domain-containing adapter-inducing interferon β -dependent. Modulation of this pathway could serve as a therapeutic target in ventilator-induced lung injury.

Response of Serum Proteome in Patients Undergoing Infrarenal Aortic Aneurysm Repair 844

Pietro Amedeo Modesti, Tania Gamberi, Cristina Bazzini, Marina Borro, Salvatore Mario Romano, Giulia Elisa Cambi, Andrea Corvi, Walter Dorigo, Laura Paparella, Carlo Pratesi, Marco Carini, GianFranco Gensini, and Alessandra Modesti

Changes of plasma proteoma after aortic surgery are described. The inhibitory effect of thrombin generation on cardiac function *in vivo* is supported by the reduction of rat cardiomyocyte contractility in response to plasma.

Uncalibrated Stroke Volume Variations Are Able to Predict the Hemodynamic Effects of Positive End-Expiratory Pressure in Patients with Acute Lung Injury or Acute Respiratory Distress Syndrome after Liver Transplantation 855

Matthieu Blais, Karine Nouette-Gaulain, Alice Quinart, Stéphanie Rouillet, Philippe Revel, and François Sztark

Positive end-expiratory pressure may reduce cardiac output and total hepatic blood flow after liver transplantation. Uncalibrated stroke volume variations are useful to predict cardiac output decrease induced by positive end-expiratory pressure.

Adaptive Support Ventilation: An Appropriate Mechanical Ventilation Strategy for Acute Respiratory Distress Syndrome? 863

Demet Sulemanji, Andrew Marchese, Paul Garbarini, Marc Wysocki, and Robert M. Kacmarek

In a lung model with varying compliance, adaptive support ventilation is better able to prevent excessive plateau pressure (PP) (>28 cm H₂O) than a fixed tidal volume of 6 ml/kg by automatically adjusting airway pressure, resulting in a decreased tidal volume.

■ PAIN MEDICINE

◆◆ **Epidural Analgesia in the Latent Phase of Labor and the Risk of Cesarean Delivery: A Five-year Randomized Controlled Trial** 871

FuZhou Wang, XiaoFeng Shen, XiRong Guo, YuZhu Peng, and XiaoQi Gu, The Labor Analgesia Examining Group (LAEG)

How early can parturients benefit from epidural labor pain control is still debated. Herein epidural analgesia at cervical dilation ≥ 1.0 cm does not prolong the progression of labor and not increase the rate of Cesarean section. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

◆◆ **Mortality Associated with Implantation and Management of Intrathecal Opioid Drug Infusion Systems to Treat Noncancer Pain** 881

Robert J. Coffey, Mary L. Owens, Steven K. Broste, Michel Y. Dubois, F. Michael Ferrante, David M. Schultz, Lisa J. Stearns, and Michael S. Turner

This investigation reveals higher than expected mortality among noncancer pain patients treated with intrathecal opioids, and it suggests that mortality risks may be mitigated by physician awareness of this information. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

S(+)-ketamine Effect on Experimental Pain and Cardiac Output: A Population Pharmacokinetic-Pharmacodynamic Modeling Study in Healthy Volunteers

892

Marnix Sigtermans, Albert Dahan, René Mooren, Martin Bauer, Benjamin Kest, Elise Sarton, and Erik Olofsen

S(+)-ketamine displays clinically relevant sex differences in its pharmacokinetics and is a potent analgesic at already low plasma concentrations, but it is associated with intense side effects.

■ REVIEW ARTICLES

Adenosine: An Old Drug Newly Discovered

904

Holger K. Eltzschig

Adenosine can function as an extracellular signaling molecule regulating diverse physiologic outcomes. This review addressed the biology of extracellular adenosine generation, signaling, uptake, and metabolism, in addition to potential therapeutic applications in perioperative medicine.

■ CASE REPORTS

Fluoroscopic Observation of the Occipitoatlantoaxial Complex during Intubation Attempt in a Rheumatoid Patient with Severe Atlantoaxial Subluxation

917

Ichiro Takenaka, Kazuyoshi Aoyama, Tamao Iwagaki, Hiroshi Ishimura, Yukari Takenaka, and Tatsuo Kadoya

■ CORRESPONDENCE

Paradigm Consciousness: A New Approach to Understanding Anesthesia Knowledge and Education

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Alice A. Edler

Body Mass Index: An Illogical Correlate of Obesity

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Matthias L. Riess, Lois A. Connolly, and Harvey J. Woehlck

In Reply *Lars Hyldborg Lundstrøm, Ann M. Møller, and Jørn Wetterslev*

Ventilator-associated Pneumonia or Endotracheal Tube-associated Pneumonia or None of the Above? Lessons Learned from Laboratory Animal Studies

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Lorenzo Berra and Theodor Kolobow

Endotracheal Tube-associated Pneumonia

Subramanian Sathishkumar and Jens Fassl

In Reply *Ioannis A. Pneumatikos, Christos K. Dragoumanis, and Demosthenes E. Bouros*

Wren, Boyle, and the Origins of Intravenous Injections and the Royal Society of London

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In Reply *George S. Bause*

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Esmolol May Abolish Volatile Anesthetic-induced Postconditioning by Scavenging Reactive Oxygen Species

Zhengyuan Xia and Michael G. Irwin

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In Reply Markus Lange and Matthias L. Riess

Goals Neither Validated Nor Met in Goal-directed Colloid *versus* Crystalloid Therapy

David A. Lubarsky, Kenneth G. Proctor, and Miguel Cobas

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In Reply Oliver Kimberger, Luzius B. Hildebrand, and Gisli H. Sigurdsson

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Portrait of Paul M. Wood, M.D.

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