



◇ THIS MONTH IN ANESTHESIOLOGY

9A

◆ EDITORIAL VIEWS

Opiates, Sleep, and Pain: The Adenosinergic Link

1175

*Jason T. Moore and Max B. Kelz***Postconditioning and Controlled Reperfusion: The Nerve of It All**

1177

*Jakob Vinten-Johansen***Perioperative Comparative Effectiveness Research: An Opportunity Calling**

1180

*Sachin Kheterpal***CME Too Much of a Good Thing Is Wonderful: Observational Data for Perioperative Research**

1183

*Sachin Kheterpal, Derek T. Woodrum, and Kevin K. Tremper***Perioperative Platelet Activation and the Inhibitory Effect of Milrinone**

1185

*Nauder Faraday***Pain Assessment, Sedation, and Analgesic Administration in the Intensive Care Unit**

1187

*Avinash B. Kumar and Timothy J. Brennan***To Our Authors**

1189

James C. Eisenach

■ SPECIAL ARTICLE

2009 in Review: Advancing Medicine in Anesthesiology

1192

Alain Borgeat, Timothy J. Brennan, James C. Eisenach, Hugh C. Hemmings, Jr., Shiroh Isono, Judy R. Kersten, Eberhard Kochs, Bruno Riou, and David S. Warner

In this review of publications in ANESTHESIOLOGY in 2009, we highlight articles that have advanced clinical care and science in our medical specialty.

■ PERIOPERATIVE MEDICINE

◆ Neuroprotection against Spinal Cord Ischemia-Reperfusion Injury Induced by Different Ischemic Postconditioning Methods: Roles of Phosphatidylinositol 3-Kinase-Akt and Extracellular Signal-regulated Kinase

1197

Xiaojing Jiang, Chunyu Ai, Enyi Shi, Yoshiki Nakajima, and Hong Ma

Standard postconditioning, a series of brief mechanical interruptions of reperfusion, and modified postconditioning, controlled low-pressure perfusion, possess comparable neuroprotection on the spinal cord, in which phosphatidylinositol 3-kinase-Akt and extracellular signal-regulated kinase play crucial roles.

Continued on page 14A

◇ Refers to This Month in Anesthesiology

◆ Refers to Editorial Views

🌐 See Supplemental Digital Content

CME CME Article

- ◆◆ **Perioperative Outcomes after Unilateral and Bilateral Total Knee Arthroplasty** 1206
Stavros G. Memtsoudis, Yan Ma, Alejandro González Della Valle, Madhu Mazumdar, Licia K. Gaber-Baylis, C. Ronald MacKenzie, and Thomas P. Sculco
 An inpatient nationwide database was analyzed for differences in perioperative outcomes between unilateral total knee arthroplasties (UTKAs) and bilateral total knee arthroplasties (BTKAs) from 1998 to 2006. BTKAs performed during the same *versus* different operations at the same hospitalization were also compared. BTKAs carry increased risk of perioperative complications and mortality compared with UTKAs. Staging BTKA procedures during the same hospitalization offered no mortality benefit, and may even expose patients to increased morbidity.
- CME ◆◆ **Intraoperative Hypotension and 1-Year Mortality after Noncardiac Surgery** 1217
Jilles B. Bijker, Wilton A. van Klei, Yvonne Vergouwe, Douglas J. Eleveld, Leo van Wolfswinkel, Karel G. M. Moons, and Cor J. Kalkman
 A simple causal relation between intraoperative hypotension and 1-yr mortality after noncardiac surgery could not be demonstrated. However, advanced analyses did suggest that lower blood pressures are tolerated for shorter durations in elderly patients.
- ◆ **Phosphodiesterase 3 Inhibition Reduces Platelet Activation and Monocyte Tissue Factor Expression in Knee Arthroplasty Patients** 1227
Satoru Beppu, Yasufumi Nakajima, Masayuki Shibasaki, Kyoko Kageyama, Toshiki Mizobe, Nobuaki Shime, and Naoyuki Matsuda
 Continuous milrinone infusion reduces platelet activation, monocyte-platelet conjugate formation, and monocyte tissue factor expression during and after total knee arthroplasty.
- Sevoflurane Ameliorates Gas Exchange and Attenuates Lung Damage in Experimental Lipopolysaccharide-induced Lung Injury** 1238
Stefanie Voigtsberger, Robert A. Lachmann, Anik C. Leutert, Martin Schläpfer, Christa Booy, Livia Reyes, Martin Urner, Julia Schild, Ralph C. Schimmer, and Beatrice Beck-Schimmer
 This study shows for the first time that late postconditioning with a volatile anesthetic, initiated 2 h after the onset of injury, attenuates acute lung injury.
- Hepatic Effects of Thoracic Epidural Analgesia in Experimental Severe Acute Pancreatitis** 1249
Hendrik Freise, Stefan Lauer, Eva Konietzny, Juergen Hinkelmann, Evgeni Minin, Hugo K. Van Aken, Markus M. Lerch, Andreas W. Sielenkaemper, and Lars G. Fischer
 Experimental thoracic epidural anesthesia with 15 μ l/h bupivacaine, 0.5%, did not alter hepatic microcirculation in healthy rats. In severe pancreatitis, however, thoracic epidural anesthesia reduced sinusoidal constriction and prevented intrahepatic apoptotic cell death.
- Differential Role of Pim-1 Kinase in Anesthetic-induced and Ischemic Preconditioning against Myocardial Infarction** 1257
Jan Stumpner, Andreas Redel, Anna Kellermann, Christopher A. Lotz, Christoph A. Blomeyer, Thorsten M. Smul, Franz Kehl, Norbert Roewer, and Markus Lange
 Pim-1 kinase regulates cardiomyocyte survival downstream of protein kinase B/Akt. The authors demonstrate that Pim-1 kinase has a differential role in desflurane-induced and ischemic preconditioning against myocardial infarction in mice *in vivo*.

Comparison of Standard Polyvinyl Chloride Tracheal Tubes and Straight Reinforced Tracheal Tubes for Tracheal Intubation through Different Sizes of the Airtraq Laryngoscope in Anesthetized and Paralyzed Patients: A Randomized Prospective Study

1265

Vassilios K. Dimitriou, Ioannis D. Zogogiannis, Amalia K. Douma, Nikolaos D. Pentilas, Despoina G. Liotiri, Mitchell S. Wachtel, and Dimitrios Karakitsos

The angle of straight reinforced tracheal tubes emerging from the Airtraq laryngoscope (Prodol Meditec S.A., Vizcaya, Spain) seems to be the most important factor for successful intubation. Polyvinyl chloride tracheal tubes were found to be superior compared with straight reinforced tracheal tubes.

Propofol Facilitates Glutamatergic Transmission to Neurons of the Ventrolateral Preoptic Nucleus

1271

Ke Y. Li, Yan-zhong Guan, Kresimir Krnjević, and Jiang H. Ye

Propofol enhances glutamate release onto neurons of the ventrolateral preoptic area by potentiating the function of γ -aminobutyric acid type A receptors on the glutamatergic afferents. These effects may contribute to its sedative action.



Susceptibility to Fraud in Systematic Reviews: Lessons from the Reuben Case

1279

Emmanuel Marret, Nadia Elia, Jørgen B. Dahl, Henry J. McQuay, Steen Møiniche, R. Andrew Moore, Sebastian Straube, and Martin R. Tramèr

Carefully performed systematic reviews proved robust against the impact of Reuben reports. Meta-analyses were vulnerable if the fraudulent data were more than 30% of the total. Qualitative systematic reviews seemed at greater risk than quantitative. SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

Healthcare Provider and Parent Behavior and Children's Coping and Distress at Anesthesia Induction

1290

Jill MacLaren Chorney, Carrie Torrey, Ronald Blount, Christine E. McLaren, Wen-Pin Chen, and Zeev N. Kain

The data presented here provide evidence for a relation between discrete anesthesiologist, nurse, and parent behaviors and children's distress and coping at anesthesia induction.

Xenon Attenuates Excitatory Synaptic Transmission in the Rodent Prefrontal Cortex and Spinal Cord Dorsal Horn

1297

Rainer Haseneder, Stephan Kratzer, Eberhard Kochs, Corinna Mattusch, Matthias Eder, and Gerhard Rammes

In acute brain slice preparations of the mouse prefrontal cortex and rat spinal cord dorsal horn, xenon depresses excitatory synaptic transmission without affecting inhibitory synaptic transmission.

■ **CRITICAL CARE MEDICINE**

◆◆ **Pain Assessment Is Associated with Decreased Duration of Mechanical Ventilation in the Intensive Care Unit: A *Post Hoc* Analysis of the DOLOREA Study**

1308

Jean-Francois Payen, Jean-Luc Bosson, G  rald Chanques, Jean Mantz, and Jos   Labarere, for the DOLOREA Investigators

Pain assessment, with concomitant high rates of sedation assessment and a restricted use of midazolam, is independently associated with a decreased duration of mechanical ventilation in the intensive care unit.

Continued on page 18A

Differential Effects of Buffered Hypercapnia *versus* Hypercapnic Acidosis on Shock and Lung Injury Induced by Systemic Sepsis

1317

Brendan D. Higgins, Joseph Costello, Maya Contreras, Patrick Hassett, Daniel O' Toole, and John G. Laffey

Both hypercapnic acidosis and buffered hypercapnia attenuate the hemodynamic consequences of systemic sepsis. In contrast, hypercapnic acidosis, but not buffered hypercapnia, reduced the severity of the lung injury induced by systemic sepsis.

■ PAIN MEDICINE

◆◆ Opioid-induced Decreases in Rat Brain Adenosine Levels Are Reversed by Inhibiting Adenosine Deaminase

1327

Ariana M. Nelson, Alanna S. Battersby, Helen A. Baghdoyan, and Ralph Lydic

Opioids significantly decreased adenosine levels in the substantia innominata and pontine reticular formation. The morphine-induced decrease in adenosine was blocked by naloxone and reversed by an adenosine deaminase inhibitor.

Pronociceptive Effects of Remifentanyl in a Mouse Model of Postsurgical Pain: Effect of a Second Surgery

1334

David Cabañero, Ana Campillo, Evelyne Célérier, Asunción Romero, and Margarita M. Puig

The pronociceptive effects of remifentanyl are influenced by the dose ($\mu\text{g} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$) rather than by the infusion duration. A second surgery enhances postoperative hyperalgesia, which is further increased by remifentanyl administration.

Serious Complications Associated with External Intrathecal Catheters Used in Cancer Pain Patients: A Systematic Review and Meta-analysis

1346

Daniel Aprili, Oliver Bandschapp, Christoph Rochlitz, Albert Urwyler, and Wilhelm Ruppen

A systematic review and a pooled analysis of observational studies were performed. The authors found that serious complications such as infection, bleeding, and neurologic damage are rare in both hospitalized and homebound patients with intrathecal catheters.

Modulation of Morphine-induced Antinociception in Acute and Chronic Opioid Treatment by Ibudilast

1356

Tuomas O. Lilius, Pekka V. Rauhala, Oleg Kambur, and Eija A. Kalso

Ibudilast, an inhibitor of phosphodiesterase and glial activation, had only a modest antinociceptive effect in thermal nociception in rats. However, it potently reversed morphine tolerance but did not prevent its development.

■ CLINICAL CONCEPTS AND COMMENTARY

Neurotoxicity of General Anesthetics: Cause for Concern?

1365

Misha Perouansky and Hugh C. Hemmings, Jr.

Accumulating evidence indicates that general anesthetics can have persistent adverse neurologic effects. Identification of risk factors and understanding their mechanisms is important to identify and minimize the risks.

■ CLASSIC PAPERS REVISITED

Succinylcholine-induced Hyperkalemia and Beyond

1372

Gerald A. Gronert

This article is a revisiting of original material published as Gronert GA, Theye RA: Pathophysiology of hyperkalemia induced by succinylcholine. *ANESTHESIOLOGY* 1975; 43:89-99.

Continued on page 22A

■ CORRESPONDENCE

Does B-type Natriuretic Peptide or Its Gene Polymorphism Predict Patient Outcome after Coronary Artery Bypass Graft Surgery?

1378

Hai Yu, Da Zhu, and Bin Liu

In Reply *Amanda A. Fox, Charles D. Collard, Stanton K. Shernan, Christine E. Seidman, Jonathan G. Seidman, Kuang-Yu Liu, Jochen D. Muehlschlegel, Tjorvi E. Perry, Sary F. Aranki, Christoph Lange, Daniel S. Herman, Thomas Meitinger, Peter Lichtner, and Simon C. Body*

Learning Disabilities May Be Related to Undetected Hypoxia

1379

James A. Mitchell

Learning Disability and Repeated Anesthetics: Drugs or Airway Management Issues?

Charles J. Coté

The Elephant in the Room

G. Suren Arul and Karl-Christian Thies

“If the Odds Are a Million to One against Something Occurring, Chances Are 50–50 It Will”

Daniel A. Tolpin and Charles D. Collard

Anesthesia in Infancy Linked to Later Disabilities: Causation, Association, or Coincidence?

Susan P. Taylor

Surgical Diagnosis Is an Important Variable to Consider in Postanesthesia Exposure-associated Learning Disabilities

Christopher L. Pysyk, Kimmo Murto, Sally Kuehn, and Dermot R. Doherty

Hyperoxia in Pediatric Anesthesia: Time for Reconsideration?

Vincent J. Kopp

In Reply *Brian P. Head and Piyush M. Patel*

In Reply *Randall P. Flick, Robert T. Wilder, Juraj Sprung, Slavica K. Katusic, Robert Voigt, Robert Colligan, Darrell R. Schroeder, Amy L. Weaver, and David O. Warner*

The Need for Perspective

1386

Karthik Raghunathan, Donald A. Schwartz, and Neil Roy Connelly

In Reply *Timothy T. Houle and James C. Eisenach*

“Innocent Prattle” and the Quality of Scientific Discourse

1387

Guohua Li and Lena S. Sun

In Reply *Robert S. Lagasse*

Outpatients Do Not Need to Void after Short Neuraxial Blocks

1388

Michael F. Mulroy

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

Continued on page 24A

High Positive End-expiratory Pressure and Mortality in Acute Respiratory Distress Syndrome

David Pestaña

1389

In Reply Susan I. Phoenix and Mahesh Nirmalan

Is It Time for a Glidescope Letter?

Glynne D. Stanley

1391

■ ANESTHESIOLOGY REFLECTIONS

Great Lakers' Anesthesia Machines

George S. Bause

1182

Fourneau Synthesizes Stovaine

George S. Bause

1226

Noel Gillespie's Diaries

George S. Bause

1270

Sertürner Crystallizes Morphine

George S. Bause

1307

■ REVIEWS OF EDUCATIONAL MATERIAL

1392

■ ANNOUNCEMENTS

1395

■ AWARDS

1397

■ ACKNOWLEDGMENT

1398

■ CLASSIFIED ADS

42A

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