



ON THE COVER:

Some recent FAER awardees, as well as the current and former FAER Presidents (Denham S. Ward, M.D., Ph.D., foreground, Alan D. Sessler, M.D., background), in celebration of FAER's 25th anniversary.

THIS MONTH IN ANESTHESIOLOGY

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FAER Indicates that one or more authors on the paper have received FAER funding

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Journal-related Activities and Other Special Activities at the 2011 American Society of Anesthesiologists Annual Meeting 689

Michael J. Avram, Alain Borgeat, James C. Eisenach, Hugh C. Hemmings, Jr., Shiroh Isono, and Jeanine P. Wiener-Kronish

FAER Evan D. Kharasch, M.D., Ph.D., Recipient of the 2011 Excellence in Research Award 696

Alex. S. Evers

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Kevin K. Tremper

PERIOPERATIVE MEDICINE

FAER Rapid Eye Movement Sleep Debt Accrues in Mice Exposed to Volatile Anesthetics 702

Jeremy Pick, Yihan Chen, Jason T. Moore, Yi Sun, Abraham J. Wyner, Eliot B. Friedman, and Max B. Kelz

Mice anesthetized for 6 h with sevoflurane, isoflurane, or halothane accrue a rapid eye movement sleep deficit as evidenced by a significant rapid eye movement sleep rebound following anesthesia.

FAER Autopsy Utilization in Medicolegal Defense of Anesthesiologists 713

Lorri A. Lee, Linda S. Stephens, Corinne L. Fligner, Karen L. Posner, Frederick W. Cheney, Robert A. Caplan, and Karen B. Domino

This study of anesthetic malpractice claims found that autopsy findings are more often helpful than harmful in the defense of anesthesia care. Autopsies should be encouraged for unexpected deaths or death with ambiguous causes.

Transient Effects of Anesthetics on Dendritic Spines and Filopodia in the Living Mouse Cortex 718

Guang Yang, Paul C. Chang, Alex Bekker, Thomas J. J. Blanck, and Wen-Biao Gan

Exposure to general anesthetics has no significant effect on dendritic spine dynamics in the living mouse cortex but transiently alters the dynamics of dendritic filopodia, spine precursors.

FAER Human Alzheimer and Inflammation Biomarkers after Anesthesia and Surgery 727

Junxia X. Tang, Dimitry Baranov, Mary Hammond, Leslie M. Shaw, Maryellen F. Eckenhoff, and Roderic G. Eckenhoff

Human cerebrospinal fluid biomarkers for Alzheimer disease and inflammation are altered within 48 h of endoscopic nasal surgery toward an injury and neuroinflammatory pattern. Differences between inhalational and total intravenous anesthetic approaches were detected.

Norepinephrine Infusion into Nucleus Basalis Elicits Microarousal in Desflurane-anesthetized Rats 733

Siveshigan Pillay, Jeannette A. Vizuete, J. Bruce McCallum, and Anthony G. Hudetz

Microinfusion of norepinephrine into nucleus basalis produces transient electrocortical and behavioral arousal in desflurane-anesthetized rats.

Buprenorphine Disrupts Sleep and Decreases Adenosine Concentrations in Sleep-regulating Brain Regions of Sprague Dawley Rat 743

Elizabeth A. Gauthier, Sarah E. Guzick, Chad M. Brummett, Helen A. Baghdoyan, and Ralph Lydic

Buprenorphine decreased adenosine concentrations in the basal forebrain and pontine reticular formation, disrupted sleep architecture, and inhibited rapid eye movement sleep. The sedative-hypnotic eszopiclone prevented sleep disruption by buprenorphine.

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- FAER** **Isoflurane Decreases Self-renewal Capacity of Rat Cultured Neural Stem Cells** 754
Deborah J. Culley, Justin D. Boyd, Arvind Palanisamy, Zhongcong Xie, Koji Kojima, Charles A. Vacanti, Rudolph E. Tanzi, and Gregory Crosby
This study demonstrates that concentrations of isoflurane at and above minimum alveolar concentrations impair proliferation of rat embryonic neural stem cells in culture but lower concentrations do not.
- FAER** **Closed-loop Continuous Infusions of Etomidate and Etomidate Analogs in Rats: A Comparative Study of Dosing and the Impact on Adrenocortical Function** 764
Joseph F. Cotten, Ri Le Ge, Natalie Banacos, Ervin Pejo, S. Shaukat Husain, James H. Williams, and Douglas E. Raines
During continuous infusion, methoxycarbonyl etomidate and etomidate suppressed adrenocortical function; however, postinfusion recovery occurred more quickly with methoxycarbonyl etomidate. Carboetomidate had no significant effect on adrenocortical function during or after continuous infusion.
- FAER** **Continuous Femoral Nerve Blocks: Varying Local Anesthetic Delivery Method (Bolus versus Basal) to Minimize Quadriceps Motor Block while Maintaining Sensory Block** 774
Matthew T. Charous, Sarah J. Madison, Preetham J. Suresh, NavParkash S. Sandhu, Vanessa J. Loland, Edward R. Mariano, Michael C. Donohue, Pascual H. Dutton, Eliza J. Ferguson, and Brian M. Ilfeld
This study did not find evidence to support the hypothesis that varying the method of local anesthetic administration—basal infusion versus repeated bolus doses—influences continuous femoral nerve block effects to a clinically significant degree.
- FAER** **Deleterious Impact of a γ -Aminobutyric Acid Type A Receptor Preferring General Anesthetic When Used in the Presence of Persistent Inflammation** 782
Kevin Boegel, Ferenc E. Gyulai, Kerry K. Moore, and Michael S. Gold
General anesthetics preferring γ -aminobutyric acid receptor type A and used during surgery in the presence of persistent inflammation significantly delay recovery from incision-induced hypersensitivity. Thus, the use of these anesthetics may increase suffering, morbidity, and overall healthcare costs.
- FAER** **Methylphenidate Actively Induces Emergence from General Anesthesia** 791
Ken Solt, Joseph F. Cotten, Aylin Cimenser, Kin F. K. Wong, Jessica J. Chemali, and Emery N. Brown
Methylphenidate induces emergence from isoflurane anesthesia in rats by increasing arousal and respiratory drive. Methylphenidate may be useful clinically as an agent to reverse general anesthetic-induced unconsciousness and respiratory depression at the end of surgery.

CRITICAL CARE MEDICINE

- Cysteinyl Leukotrienes Impair Hypoxic Pulmonary Vasoconstriction in Endotoxemic Mice** 804
Bodil Petersen, K. Frank Austen, Kenneth D. Bloch, Yukako Hotta, Fumito Ichinose, Yoshihide Kanaoka, and Warren M. Zapol

In sepsis, hypoxic pulmonary vasoconstriction is impaired and concentrations of cysteinyl leukotrienes in the bronchial alveolar fluid are increased. However, the precise role of cysteinyl leukotrienes in sepsis-induced impairment of hypoxic pulmonary vasoconstriction is unknown.

PAIN MEDICINE

- FAER** **A Single Subanesthetic Dose of Ketamine Relieves Depression-like Behaviors Induced by Neuropathic Pain in Rats** 812
Jing Wang, Yossef Goffer, Duo Xu, David S. Tukey, D. B. Shamir, Sarah E. Eberle, Anthony H. Zou, Thomas J. J. Blanck, and Edward B. Ziff

This study shows that depression is an important feature of pain. Ketamine can selectively provide immediate and enduring relief of pain-induced depression-like behaviors without targeting the sensory component of pain in rats.

Lidocaine Blocks the Hyperpolarization-activated Mixed Cation Current, I_h , in Rat Thalamocortical Neurons 822

Igor Putrenko and Stephan K. W. Schwarz

In this *in vitro* electrophysiologic study, the local anesthetic, lidocaine, concentration-dependently inhibited the hyperpolarization-activated cation current, I_h , in rat ventrobasal thalamocortical neurons with high efficacy and a potency in the micromolar range (IC_{50} , 72 μ M).

FAER Perineural Dexmedetomidine Added to Ropivacaine for Sciatic Nerve Block in Rats Prolongs the Duration of Analgesia by Blocking the Hyperpolarization-activated Cation Current 836

Chad M. Brummett, Elizabeth K. Hong, Allison M. Janda, Francesco S. Amodeo, and Ralph Lydic

Unlike with intravenous and epidural administration, perineural dexmedetomidine acts by inhibiting the hyperpolarization-activated cation current (I_h current), not through agonism of the α_2 -adrenoceptor.

FAER Strategy-dependent Dissociation of the Neural Correlates Involved in Pain Modulation 844

Jane M. Lawrence, Fumiko Hoeft, Kristen E. Sheau, and Sean C. Mackey

Functional magnetic resonance imaging revealed distinct patterns of neural activity during the use of two different cognitive strategies (attention and reappraisal) to modulate chronic pain.

EDUCATION

CASE SCENARIO

FAER Perioperative Management of a Multigravida at 34-week Gestation Diagnosed with Abnormal Placentation 852

Elena Reitman, Patricia C. Devine, Sherelle Lea Laifer-Narin, and Pamela Flood

IMAGES IN ANESTHESIOLOGY

Two Complications of Tracheal Intubation in a Neonate: Gastric Perforation and Lung Collapse 858

Jae Jun Lee, Byoung Yoon Ryu, Ji Su Jang, and Sung Mi Hwang

ANESTHESIA LITERATURE REVIEW 859

ORIGINAL INVESTIGATIONS IN EDUCATION

FAER Determining Resident Clinical Performance: Getting Beyond the Noise 862

Keith Baker

There is an ongoing need for valid and reliable measures of resident clinical performance. From July 2008 to June 2010, 140 faculty members returned 14,469 evaluations on 108 residents. Many faculty scores were positively biased relative to unbiased faculty. Positive bias effects were eliminated by normalizing each performance score to the unique scoring characteristics of each faculty member (Z scores). Individual Z scores had low amounts of performance information but signal averaging allowed determination of reliable performance scores. Average Z scores were stable over time, related to external measures of medical knowledge, identified residents referred to the clinical competency committee, and increased when performance improved due to an intervention. This study demonstrates a reliable and valid clinical performance assessment system for residents at all levels of training.

REVIEW ARTICLE

CME Perioperative Stroke in Noncardiac, Nonneurosurgical Surgery 879

Julie L. W. Ng, Matthew T. V. Chan, and Adrian W. Gelb

Perioperative stroke is more common than generally acknowledged. Increased awareness, management of predisposing risk factors, and early detection should improve outcomes.

MIND TO MIND

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