



ON THE COVER:

Ultrasound imaging facilitates many procedures in the perioperative period, and has transformed the approach to many patients in the emergency room. In this issue we present an article and editorial from Italy demonstrating the routine use of ultrasound in the critical care unit to confirm, deny, and establish new diagnoses which alter patient care.

- Pelosi and Corradi: Ultrasonography in the Intensive Care Unit: "Looking at the World through Colored Glasses," p. 696
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■ PERIOPERATIVE MEDICINE

- 2** **Prevention of Intraoperative Awareness with Explicit Recall in an Unselected Surgical Population: A Randomized Comparative Effectiveness Trial** 717
George A. Mashour, Amy Shanks, Kevin K. Tremper, Sachin Kheterpal, Christopher R. Turner, Satya Krishna Ramachandran, Paul Picton, Christa Schueller, Michelle Morris, John C. Vandervest, Nan Lin, and Michael S. Avidan
 This comparative effectiveness trial was unable to determine a difference between protocols based on bispectral index values and anesthetic concentration in the prevention of intraoperative awareness in an unselected surgical population.
- 2** **Additional Cross-sectional Transesophageal Echocardiography Views Improve Perioperative Right Heart Assessment** 726
Jorge Kasper, Daniel Bolliger, Karl Skarvan, Peter Buser, Miodrag Filipovic, and Manfred Daniel Seeberger
 This prospective transesophageal echocardiographic study found that additional cross-sectional views focusing on the right heart can be obtained as reliably as standard views. Several of these views improve comprehensive imaging of the right heart.
- Marked Hyperglycemia Attenuates Anesthetic Preconditioning in Human-induced Pluripotent Stem Cell-derived Cardiomyocytes** 735
Scott G. Canfield, Ana Sepac, Filip Sedlic, Maria Y. Muravyeva, Xiaowen Bai, and Zeljko J. Bosnjak
 We used human-induced pluripotent stem cells generated from diabetic and nondiabetic donors to generate cardiomyocytes for studying anesthetic preconditioning. High glucose levels, but not genetic factors, are responsible for lack of preconditioning in diabetic cardiomyocytes. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*
- Epinephrine Induces Rapid Deterioration in Pulmonary Oxygen Exchange in Intact, Anesthetized Rats: A Flow and Pulmonary Capillary Pressure-dependent Phenomenon** 745
Vijay Krishnamoorthy, David B. Hiller, Richard Ripper, Bocheng Lin, Stephen M. Vogel, Douglas L. Feinstein, Sarah Oswald, Leelach Rothschild, Priscilla Hensel, Israel Rubinstein, Richard Minshall, and Guy L. Weinberg
 Intravenous bolus administration of epinephrine rapidly induces arterial hypoxemia.
- 2** **A Perioperative Smoking Cessation Intervention with Varenicline: A Double-blind, Randomized, Placebo-controlled Trial** 755
Jean Wong, Amir Abrishami, Yiliang Yang, Amna Zaki, Zeev Friedman, Peter Selby, Kenneth R. Chapman, and Frances Chung
 A perioperative smoking cessation intervention with varenicline and counseling significantly increased short- and long-term abstinence (12 months) after elective noncardiac surgery, with no increase in serious adverse events.
- Mutations M287L and Q266I in the Glycine Receptor α 1 Subunit Change Sensitivity to Volatile Anesthetics in Oocytes and Neurons, but Not the Minimal Alveolar Concentration in Knockin Mice** 765
Cecilia M. Borghese, Wei Xiong, S. Irene Oh, Angel Ho, S. John Mihic, Li Zhang, David M. Lovinger, Gregg E. Homanics, Edmond I. Eger 2nd, and R. Adron Harris
 Inhaled anesthetics similarly immobilized wild-type mice and mice carrying mutated α 1 glycine receptor subunits with differential sensitivity to isoflurane, indicating these receptors are not important for the action of inhaled anesthetics.
- 2** **Deficits in Retention for Verbally Presented Medical Information** 772
Elisabeth H. Sandberg, Ritu Sharma, and Warren S. Sandberg
 Healthy subjects remember only a fraction of verbally presented medical information, despite evidence that the information was initially encoded. In a free recall situation, mimicking actual patients' experience, only about 20% of information is remembered.

γ-Aminobutyric Acid Receptor Type A Receptor Potentiation Reduces Firing of Neuronal Assemblies in a Computational Cortical Model 780

Kingsley P. Storer and George N. Reeke

In a computational model of the cortex, $\bar{\alpha}$ -aminobutyric acid receptor type A receptor potentiation reduces formation of neuronal groups. This process may underlie the ability of propofol to abolish new memory formation and consciousness.

Roles of Aldosterone and Oxytocin in Abnormalities Caused by Sevoflurane Anesthesia in Neonatal Rats 791

Wengang Cao, Christopher Pavlinec, Nikolaus Gravenstein, Christoph N. Seubert, and Anatoly E. Martynyuk

The developmental effects of neonatal anesthesia with sevoflurane may involve both central and peripheral actions of the anesthetic and subsequent increases in neuronal activity.

■ CRITICAL CARE MEDICINE

Deep Impact of Ultrasound in the Intensive Care Unit: The “ICU-sound” Protocol 801

Emilpaolo Manno, Mauro Navarra, Luciana Faccio, Mohsen Motevallian, Luca Bertolaccini, Abdou Mfochivè, Marco Pesce, and Andrea Evangelista

The aim of this study was to determine whether ultrasound examination can be performed to detect occult anomalies, to prompt urgent changes in therapy or induce further testing or interventions, and to confirm or modify diagnosis of patients admitted to a general intensive care unit. One hundred twenty-five consecutive patients were assessed under a critical care ultrasonography protocol, and the data were analyzed prospectively. Systematic ultrasound examination of the optic nerve, thorax, heart, abdomen, and venous system prompted further testing in 23/125 patients (18.4%) and led to changes in medical therapy in 22/125 (17.6%) and to invasive procedures in 27/125 (21.6%). The highest number of new ultrasound abnormalities was detected in patients with septic shock. This ultrasound protocol holds potential for improving health care quality.

Multifractal Analysis of Hemodynamic Behavior: Intraoperative Instability and Its Pharmacological Manipulation 810

Steven M. Bishop, Sarah I. Yarham, Vilas U. Navapurkar, David K. Menon, and Ari Ercole

Intraoperative heart rate and blood pressure fluctuations were characterized using multifractal techniques. Physiological instability is characterized by increased signal complexity, suggesting that homeokinetic mechanisms are recruited. Underlying system dynamics are amenable to pharmacological manipulation. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

Alveolar Macrophages and Toll-like Receptor 4 Mediate Ventilated Lung Ischemia Reperfusion Injury in Mice 822

Arun Prakash, Kailin R. Mesa, Kevin Wilhelmsen, Fengyun Xu, Jeffrey M. Dodd-o, and Judith Hellman

Alveolar macrophages and toll-like receptor 4 are required for inflammatory cytokine production and neutrophil recruitment in ventilated lung ischemia reperfusion injury in mice. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

Intralipid, a Clinically Safe Compound, Protects the Heart Against Ischemia-Reperfusion Injury More Efficiently Than Cyclosporine-A 836

Jingyuan Li, Andrea Iorga, Salil Sharma, Ji-Youn Youn, Rod Partow-Navid, Soban Umar, Hua Cai, Siamak Rahman, and Mansoureh Eghbali

Although intralipid inhibits the mitochondrial permeability transition pore opening as efficiently as cyclosporine-A by increasing mitochondrial resistance to Ca^{2+} overload and reducing mitochondrial superoxide production, intralipid is also more effective in protecting the heart against ischemia-reperfusion injury than cyclosporine-A.

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Masami Suzuki, Minoru Narita, Minami Hasegawa, Sadayoshi Furuta, Tomoyuki Kawamata, Maho Ashikawa, Kanako Miyano, Kazuyoshi Yanagihara, Fumiko Chiwaki, Takahiro Ochiya, Tsutomu Suzuki, Motohiro Matoba, Hiroki Sasaki, and Yasuhito Uezono

Mice with peritoneal carcinomatosis exhibit hypersensitivity to mechanical stimulation and visceral pain-like behavior, which is accompanied by an increase in the expression of substance P and the down-regulation of μ -opioid receptors.

Quantitative Changes in Regional Cerebral Blood Flow Induced by Cold, Heat and Ischemic Pain: A Continuous Arterial Spin Labeling Study 857

Michael A. Frölich, Hrishikesh Deshpande, Timothy Ness, and Georg Deutsch

It was observed that quantitative regional cerebral blood flow changes in response to pain evoke consistent regional cerebral blood flow change in Brodmann area 6, an area responsible for the integration of a motor activity.

Effect of Subanesthetic Ketamine on Intrinsic Functional Brain Connectivity: A Placebo-controlled Functional Magnetic Resonance Imaging Study in Healthy Male Volunteers 868

Marieke Niesters, Najmeh Khalili-Mahani, Christian Martini, Leon Aarts, Joop van Gerven, Mark A. van Buchem, Albert Dahan, and Serge Rombouts

Resting-state functional magnetic resonance imaging is a useful and efficient method for assessing drug effect on the brain. Ketamine induced connectivity changes in brain areas involved in motor function, psychedelic effects, and pain processing.

■ EDUCATION

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Emily J. Baird and Valerie A. Arkoosh

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Unanticipated Difficult Airway in Obstetric Patients: Development of a New Algorithm for Formative Assessment in High-fidelity Simulation 883

Mrinalini Balki, Mary Ellen Cooke, Susan Dunington, Aliya Salman, and Eric Goldszmidt

This study illustrates the development of a new consensus-based algorithm for the management of unanticipated difficult airway in obstetric patients, and demonstrates its feasibility in formative assessment using high-fidelity simulation.

CLINICAL CONCEPTS AND COMMENTARY

Acquired Liver Injury in the Intensive Care Unit 898

Thomas Lescot, Constantine Karvellas, Marc Beaussier, and Sheldon Magder

In critically ill patients, hepatic impairment can occur. The authors review the causes and mechanisms of acquired liver injury in the intensive care unit and discuss possible clinical implications.

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Comparative Performance of Direct and Video Laryngoscopes in Patients with Predicted Difficult Airway 911

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At Higher Risk of Difficulty Is Not True Difficulty: The Challenge of Device Performance Assessment in the Difficult Airway

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Stephen M. Rupp, Jeffrey L. Apfelbaum, Richard T. Connis, and David G. Nickinovich, on behalf of the American Society of Anesthesiologists Task Force on Central Venous Access.

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David Faraoni, Yannick Ciccarella, and Philippe Van der Linden

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