



# Anesthesiology



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 American Society of Critical Care Anesthesiologists  
 Society for Obstetric Anesthesia and Perinatology



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- Mutations in type-1 ryanodine receptor (*RYR1*) gene may be causal for malignant hyperthermia (MH). Human B lymphocyte expresses *RYR1*. We found that  $Ca^{2+}$  responses to ryanodine receptor-stimulating agents in B cells from MH-susceptible (MHS) individuals were significantly greater than  $Ca^{2+}$  responses in B cells from MH-negative (MHN) and control individuals.

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*Nicole Monnier, Renée Krivosic-Horber, Jean-François Payen, Geneviève Kozak-Ribbens, Yves Nivoche, Pascal Adnet, Hugo Reyford, and Joël Lunardi*  
 The characterization of homozygous and compound heterozygous malignant hyperthermia-susceptible patients raised questions regarding the definition of genetic heterogeneity and the incidence of the malignant hyperthermia susceptibility in the general population.
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*Paul F. White, Tijani Issioui, Jie Hu, Stephanie B. Jones, Jayne E. Coleman, Jean P. Waddle, Scott D. Markowitz, Margarita Coloma, Amy R. Macaluso, and Caleb H. Ing*  
 When used for antiemetic prophylaxis in patients also receiving low-dose droperidol, a commercial acustimulation device compared favorably with ondansetron (4 mg intravenously) for preventing postoperative nausea and vomiting. In addition, the concurrent use of the acustimulation device improved the antiemetic efficacy of ondansetron.
- Concentration-Effect Relation of Succinylcholine Chloride during Propofol Anesthesia** **1082**  
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 A significant number of children who undergo outpatient surgery experience new-onset postoperative sleep-related problems. The clinical significance of this finding, however, is unclear.
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*Andreas E. Biedler, Sven O. Schneider, Ullrich Seyfert, Hauke Rensing, Sasha Grenner, Matthias Girndt, Inge Bauer, and Michael Bauer*  
 Banked whole blood has an immunosuppressive effect as reflected in depressed proinflammatory and enhanced antiinflammatory cytokine release. This effect is only partially prevented by prestorage leukodepletion and depends primarily on storage-associated factors, while alloantigens seem to be of limited significance.
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*Mihai V. Podgoreanu, Robert G. Stout, Habib E. El-Moalem, and David G. Silverman*  
 Skin microvascular blood flow displays rhythmic oscillations with characteristic frequencies during nonpulsatile cardiopulmonary bypass, reflecting modifications in the sympatho-vagal balance at the level of the microvasculature. In the forehead microcirculation, the oscillations become progressively more synchronized and may represent an important homeostatic process.
- ◇ **Platelet P1<sup>A2</sup> Polymorphism and Platelet Activation Are Associated with Increased Troponin I Release after Cardiopulmonary Bypass** **1118**  
*Christine S. Rinder, Joseph P. Mathew, Henry M. Rinder, J. Greg Howe, Manuel Fontes, Jill Crouch, Stephen Pfau, Parag Patel, and Brian R. Smith*  
 The P1<sup>A2</sup> polymorphism of platelet glycoprotein IIIa has been identified as a prothrombotic risk factor in a number of cardiovascular settings. Patients who were positive for the P1<sup>A2</sup> allele had significantly greater troponin I release following cardiopulmonary bypass than P1<sup>A1</sup> homozygotes.




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*Nobuya Kato, Kazuhiro Nakanishi, Shinichi Yoshino, and Ryo Ogawa*

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**The Minimum Alveolar Concentration of Xenon in the  
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*Takahisa Goto, Yoshinori Nakata, and Shigeho Morita*

The minimum alveolar concentration of xenon in patients aged 65 yr or older was 69% (95% CI, 63–76%) for men and 51% (45–58%) for women. The value for men was significantly greater than that for women.

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*Rainer J. Litz, Matthias Hübler, Wolfram Lorenz, Volker K. Meier, and D. Michael Albrecht*

Desflurane and isoflurane did not lead to a deterioration of renal parameters in renal-compromised patients.

**Intravenous Magnesium Sulfate Administration Reduces  
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*Jae Chan Choi, Kyung Bong Yoon, Dae Ja Um, Chan Kim, Jin Soo Kim, and Sang Gyu Lee*

Intravenous magnesium sulfate administration reduces propofol infusion requirements during maintenance of propofol-N<sub>2</sub>O anesthesia.

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Responses to Skin Incision in Children and Adults** **1142**

*Hernán R. Muñoz, Luis I. Cortínez, Fernando R. Altermatt, and Jorge A. Dagnino*

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*Wouter de Ruijter, Ger J. M. Stienen, Jan van Klarenbosch, and Jacob J. de Lange*

The net inotropic effect of propofol may be the result of its counteracting influence on the function of the L-type calcium channel and the sodium-calcium exchanger.

- ◇ Influence of Hemorrhage on Propofol Pseudo-Steady State Concentration** **1156**

*Tomiei Kazama, Tadayoshi Kurita, Koji Morita, Jun Nakata, and Shigehito Sato*

During the pseudo-steady state of hemorrhage, while continuously infusing propofol, the plasma concentration of propofol increased less than 20% during compensated shock. However, with uncompensated shock, it increased to 3.75 times that of prehemorrhage concentrations.

- Sulfite Supported Lipid Peroxidation in Propofol Emulsions** **1162**

*Max T. Baker, Deborah J. Dehring, and Marc S. Gregerson*

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*Yasushi Mio, Norio Fukuda, Yoichiro Kusakari, Yasumasa Tanifuji, and Satoshi Kurihara*

Bupivacaine decreased  $Ca^{2+}$  sensitivity of myofilaments in intact and skinned ventricular muscle of the rat.

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*Peter J. Soja, Niwat Taepavarapruk, Walton Pang, Brian E. Cairns, Shelly A. McErlane, and Miguel C. Fragoso*

The state of general anesthesia induced by intravenously administered thiopental was accompanied by a profound suppression of spontaneous, peripherally evoked, and excitatory amino acid-evoked responses of dorsal spinocerebellar tract and spinoreticular tract neurons. These actions occurred concomitantly with profound motor suppression and transient cortical synchronization. These results provide direct evidence that the state of general barbiturate anesthesia is accompanied by a reduction of afferent input to higher brain centers through proprioceptive and nociceptive spinal pathways.

**Mild Hypothermia Has Minimal Effects on the Tolerance to Severe Progressive Normovolemic Anemia in Swine** **1189**

*Valéria Perez-de-Sá, Roger Roscher, Doris Cunha-Goncalves, Anders Larsson, and Olof Werner*

During progressive hemodilution in pigs, hypothermia did not significantly change the critical hemoglobin concentration, but it prolonged short-term survival.

**Protein Tyrosine Kinase-Dependent Modulation of Isoflurane Effects on Cardiac Sarcolemmal  $K_{ATP}$  Channel** **1198**

*Anna Stadnicka, Wai-Meng Kwok, David C. Wartier, and Zeljko J Bosnjak*

The protein tyrosine kinase inhibitor, genistein, activated whole cell adenosine triphosphate-dependent potassium ( $K_{ATP}$ ) current and increased open probability of single sarcolemmal  $K_{ATP}$  channels. Genistein-activated whole cell  $K_{ATP}$  current was potentiated by isoflurane. However, to increase open probability of single  $K_{ATP}$  channel isoflurane required genistein and protein tyrosine phosphatase 1B.

**Biphasic Effects of Isoflurane on the Cardiac Action Potential: An Ionic Basis for Anesthetic-induced Changes in Cardiac Electrophysiology** **1209**

*Akihiro Suzuki, Kei Aizawa, Susanne Gassmayr, Zeljko J. Bosnjak, and Wai-Meng Kwok*

Isoflurane induced a biphasic concentration-dependent effect on the cardiac action potential in guinea pig ventricular myocytes. Ionic currents monitored during a dynamic voltage clamp mimicking an action potential revealed that the underlying mechanism involves differential effects of the anesthetic on L-type  $Ca^{2+}$ , delayed-rectifier  $K^{+}$  current.

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*Diederik K. Van Sassenbroeck, Peter De Paepe, Frans M. Belpaire, Paul A. Boon, and Walter A. Buylaert*

In contrast to propofol, hypovolemia does not influence the pharmacokinetics and the electroencephalographic effect of  $\gamma$ -hydroxybutyrate in the rat, which may be due to its smaller volume of distribution and its hypertensive properties.

- Reactive Oxygen Species Scavengers Attenuate Endotoxin-induced Impairment of Hypoxic Pulmonary Vasoconstriction in Mice 1227

*Hemanth A. Baboolal, Fumito Ichinose, Roman Ullrich, Noriko Kawai, Kenneth D. Bloch, and Warren M. Zapol*

Reactive oxygen species scavengers prevent impairment of hypoxic pulmonary vasoconstriction in mice challenged with endotoxin.

### ■ PAIN AND REGIONAL ANESTHESIA

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- Long-term Pain and Activity during Recovery from Major Thoracotomy Using Thoracic Epidural Analgesia 1234

*E. Andrew Ochroch, Allan Gottschalk, John Augostides, Kathryn A. Carson, Laura Kent, Nini Malayaman, Larry R. Kaiser, and Stanley J. Aukburg*

Long-term pain and activity following major thoracotomy was prospectively evaluated as a function of intraoperative analgesic technique, gender, and incision type. In the face of aggressive perioperative analgesia, long-term pain following thoracotomy was less than reported in previous retrospective studies, was worse for women, and was associated with long-term decrements in postoperative physical activity.

- Brachial Plexus Nerve Block Exhibits Prolonged Duration in the Elderly 1245

*Xavier Paqueron, Gilles Boccara, Mouhssine Bendahou, Pierre Coriat, and Bruno Riou*

Mid-humeral block performed with 5 ml ropivacaine, 0.75%, onto each of the four terminal nerves of the brachial plexus produces a longer duration of anesthesia in patients aged > 70 yr compared with younger patients.

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◆ **Comparative Spinal Neurotoxicity of Prilocaine and Lidocaine** **1250**

*Tomomune Kishimoto, Andrew W. Bollen, and Kenneth Drasner*

Prilocaine and lidocaine induce similar functional impairment and morphologic damage when administered intrathecally in the rat.

**Role of Prostaglandin Receptor EP<sub>1</sub> in the Spinal Dorsal Horn in Carrageenan-induced Inflammatory Pain** **1254**

*Yoshito Nakayama, Keiichi Omote, and Akiyoshi Namiki*

An activation of spinal EP<sub>1</sub> receptors by prostaglandin E<sub>2</sub> and the subsequent increases in intracellular calcium ion concentrations in the spinal dorsal horn are involved in carrageenan-induced hyperalgesia in the late phase. The mechanisms underlying peripheral inflammation-induced plastic changes in the spinal cord are mediated by activation of the cascade including EP<sub>1</sub> receptors.

**Gabapentin and Pregabalin Can Interact Synergistically with Naproxen to Produce Antihyperalgesia** **1263**

*Robert W. Hurley, Debika Chatterjea, Meihua Rose Feng, Charles P. Taylor, and Donna L. Hammond*

Mixtures of gabapentin or pregabalin with the nonsteroidal antiinflammatory analgesic naproxen interact in a synergistic or additive manner to alleviate carrageenan-induced thermal hyperalgesia.

◇ **Major Complications of Regional Anesthesia in France: The SOS Regional Anesthesia Hotline Service** **1274**

*Yves Auroy, Dan Benhamou, Laurent Bagues, Claude Ecoffey, Bruno Falissard, Frédéric Mercier, Hervé Bouaziz, and Kamran Samii*

During a 10-month period, 487 anesthesiologists voluntarily reported complications related to regional anesthesia and the number of regional anesthesia procedures performed. Among 158,083 regional blocks performed, 56 (3.5/10,000) major complications were found to be related to regional anesthesia.



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### ■ REVIEW ARTICLE

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- ◆ **Fatigue in Anesthesia: Implications and Strategies for Patient and Provider Safety** **1281**

*Steven K. Howard, Mark R. Rosekind, Jonathan D. Katz, and Arnold J. Berry*

Fatigue is commonplace in contemporary society and is especially likely in individuals working in industries that must be in continuous operation. This article reviews the physiological challenges that face anesthesia care providers and the safety risks of working while fatigued. Data-based strategies are suggested for individual management of fatigue. The review concludes that the discipline of anesthesiology should take a leadership role in formulating health system-wide approaches for scheduling that are based on evidence rather than tradition.

### ■ CLINICAL CONCEPTS AND COMMENTARY

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- Current Techniques for Perioperative Lung Isolation in Adults** **1295**

*Javier H. Campos*

Lung isolation techniques are used to provide one-lung ventilation in patients undergoing thoracic, mediastinal, vascular, esophageal, or nonthoracic surgical procedures. This review discusses current technology with left- or right-sided double-lumen tubes and bronchial blockers (Fogarty catheters, Univent<sup>®</sup> bronchial blockers, and wire-guided endobronchial blockers), with an emphasis on placement and confirmation of optimal position with the fiberoptic bronchoscope.

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### GUIDE FOR AUTHORS

The Guide for Authors is published in the January and July issues and is available at [www.anesthesiology.org](http://www.anesthesiology.org). Please refer to the Guide for the preparation of any material for submission to ANESTHESIOLOGY.

### WEB SITE ANNOUNCEMENT

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