



Anesthesiology

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American Society of Critical Care Anesthesiologists

Society for Obstetric Anesthesia and Perinatology



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■ CLINICAL INVESTIGATIONS

◆ On-line Monitoring of End-tidal Propofol Concentration in Anesthetized Patients 659

Akira Takita, Kenichi Masui, and Tomiei Kazama

Volatile propofol in expired breath of anesthetized patients can be detected and measured in real time by proton transfer reaction mass spectrometry. Bland-Altman analysis shows agreement between the exhaled propofol concentration and the plasma propofol concentration.

- ◇ Refers to This Month in Anesthesiology
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- ◆ **Real-time Monitoring of Propofol in Expired Air in Humans Undergoing Total Intravenous Anesthesia** **665**
Cyrill Hornuss, Siegfried Praun, Johannes Villinger, Albert Dornauer, Patrick Moehnle, Michael Dolch, Ernst Weninger, Alexander Chouker, Christian Feil, Josef Briegel, Manfred Thiel, and Gustav Schelling
 This pilot study shows that propofol is eliminated in measurable quantities by the lung and that concentrations of propofol in expiratory air correlate strongly with blood concentrations. Ion-molecule reaction mass spectrometry may allow the continuous and noninvasive monitoring of expiratory propofol levels in patients undergoing general anesthesia.
- ◆ **Analysis of Deaths Related to Anesthesia in the Period 1996–2004 from Closed Claims Registered by the Danish Patient Insurance Association** **675**
Lars Dahlgaard Hove, Jacob Steinmetz, Jens Krogh Christoffersen, Ann Møller, Jacob Nielsen, and Henrik Schmidt
 This article is a closed claims analysis of deaths related to anesthesia in Denmark in the period 1996–2004.
- Factor V Leiden Does Not Affect Bleeding in Aprotinin Recipients after Cardiopulmonary Bypass** **681**
Johannes Boehm, Joachim Burkhard Grammer, Fabian Lehnert, Wulf Dietrich, Stefan Wagenpfeil, Stephen Michael Wildhirt, Michael Wottke, Siegmund Braun, Rüdiger Lange, and Robert Bauernschmitt
 Factor V Leiden carriers undergoing cardiopulmonary bypass with aprotinin have neither reduced blood loss nor reduced transfusion requirements compared with noncarriers.
- CME** **Current Practices in Sedation and Analgesia for Mechanically Ventilated Critically Ill Patients: A Prospective Multicenter Patient-based Study** **687**
Jean-Francois Payen, Gérald Chanques, Jean Mantz, Christiane Hercule, Igor Auriat, Jean-Luc Leguillou, Michèle Binhas, Céline Genty, Carole Rolland, and Jean-Luc Bosson, for the DOLOREA Investigators
 Current practices in the management of sedation and analgesia are reported for a large number of critically ill patients at multiple French hospitals. This study emphasizes the lack of assessment of sedation and pain, the lack of specific treatment during painful procedures, and the role of protocols/guidelines for the management of pain and sedation.

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Behavior of Entropy/Complexity Measures of the Electroencephalogram during Propofol-induced Sedation: Dose-dependent Effects of Remifentanyl 696

Rain Ferenets, Ann Vanluchene, Tarmo Lipping, Björn Heyse, and Michel M. R. F. Struys

The influence of remifentanyl and electroencephalographic frequency content on a set of electroencephalogram-based depth-of-anesthesia measures is studied. This study shows that the ability of these measures to follow anesthetic depth is highly dependent on electroencephalographic frequency band as well as the dose of opiates administered.

◆ Identification of Sensory Blockade by Somatosensory and Pain-induced Evoked Potentials 707

Gunter N. Schmidt, Eckehard Scharein, Markus Siegel, Jakob Müller, Stefan Debener, Rainer Nitzschke, Andreas Engel, and Petra Bischoff

The anesthesia-induced blockade of nociceptive inputs is insufficiently reflected by commercially available electroencephalographic depth-of-anesthesia monitors. The current study demonstrates that the late components of the somatosensory evoked potentials seem able to discriminate between the analgesic effect induced by remifentanyl and the sedation induced by propofol. Further studies are needed to clarify whether late somatosensory evoked potentials components can be routinely used to specifically monitor the depth of analgesia during general anesthesia.

Oxygen Tension Modulates Inhibition of L-type Calcium Currents by Isoflurane in Human Atrial Cardiomyocytes 715

Pascal Kowark, Rocco Hüneke, Eberhard Jüngling, Rolf Rossaint, and Andreas Lückhoff

Isoflurane-induced inhibition of L-type calcium currents in human atrial cardiomyocytes is considerably reduced when the partial pressure of oxygen (P_{O_2}) is decreased from 150 mmHg to 12 mmHg. The P_{O_2} does not affect calcium currents in the absence of isoflurane.

■ LABORATORY INVESTIGATIONS

◆ Regional Gas Exchange and Cellular Metabolic Activity in Ventilator-induced Lung Injury 723

Guido Musch, Jose G. Venegas, Giacomo Bellani, Tilo Winkler, Tobias Schroeder, Bodil Petersen, R. Scott Harris, and Marcos F. Vidal Melo

Using positron emission tomography with [^{18}F]fluorodeoxyglucose and [^{13}N]nitrogen, the authors could detect metabolic activation of neutrophils in a lung exposed to dynamic overdistension even in the absence of impairment in regional gas exchange. Addition of end-expiratory derecruitment to end-inspiratory overdistension rapidly converted this activation into a profound inflammatory cell response with impairment of gas exchange.

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Isoflurane Depresses the Response of Inspiratory Hypoglossal Motoneurons to Serotonin *In Vivo* 736

Ivo F. Brandes, Edward J. Zuperku, Astrid G. Stucke, Francis A. Hopp, Danica Jakovcevic, and Eckehard A. E. Stuth

Subanesthetic concentrations of isoflurane, which strongly depress canine inspiratory hypoglossal motoneurons *in vivo*, did not enhance the neuronal response to serotonin as predicted by *in vitro* data. These results suggest that anesthetic activation of leak K⁺ channels is not a dominant anesthetic mechanism involved in the depression of these neurons.

Xenon Mitigates Isoflurane-induced Neuronal Apoptosis in the Developing Rodent Brain 746

Daqing Ma, Peter Williamson, Adam Januszewski, Marie-Caroline Nogaro, Mahmuda Hossain, Lay Ping Ong, Yi Shu, Nicholas P. Franks, and Mervyn Maze

Xenon prevents isoflurane-induced apoptosis in the neonatal rat brain by modulating the intrinsic apoptotic pathways.

Subhypnotic Doses of Isoflurane Impair Auditory Discrimination in Rats 754

Rita H. Burlingame, Sneha Shrestha, Michael R. Rummel, and Matthew I. Banks

Subhypnotic doses of isoflurane impaired performance by rats on an auditory sensory discrimination task in a dose- and task difficulty-dependent manner. These data indicate that anesthetic modulation of cellular and network activity alters cortical sensory processing even before loss of consciousness.

Neuromuscular Blocking Agents' Differential Bronchoconstrictive Potential in Guinea Pig Airways 763

Edmund Jooste, Yi Zhang, and Charles W. Emala

In vivo airway interactions of neuromuscular blocking agents confirm previous *in vitro* studies: Rapacuronium is unique in that it exhibits dual detrimental interactions with airway M2 and M3 muscarinic receptors. Vecuronium, cisatracurium, rocuronium, and mivacurium are devoid of significant interactions with muscarinic receptors within clinically achieved concentrations.

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Nicolai B. Foss, Billy B. Kristensen, Morten Bundgaard, Mikkel Bak, Christian Heiring, Christina Virkelyst, Sine Hougaard, and Henrik Kehlet

Fascia iliaca compartment blockade gave superior analgesia compared with systemic opioids.

- Magnetic Resonance Imaging in Patients with Spinal Neurostimulation Systems 779

Jose De Andres, Juan Carlos Valía, German Cerda-Olmedo, Carolina Quiroz, Vincente Villanueva, Vincente Martinez-Sanjuan, and Oscar de Leon-Casasola

The safety of performing magnetic resonance imaging in patients with an implanted spinal cord stimulator is mandatory, and complications that occur as a result of the procedure must be documented.

- Spinal Cannabinoid Receptor Type 2 Activation Reduces Hypersensitivity and Spinal Cord Glial Activation after Paw Incision 787

Alfonso Romero-Sandoval and James C. Eisenach

Hypersensitivity and glial activation after paw incision are diminished by spinal administration of a cannabinoid receptor-2 agonist without concomitant central side effects.

- Spinal Prostaglandins Facilitate Exaggerated A- and C-fiber-mediated Reflex Responses and Are Critical to the Development of Allodynia Early after L5-L6 Spinal Nerve Ligation 795

Darren D. O'Rielly and Christopher W. Loomis

Mechanical allodynia, induced by L5-L6 spinal nerve ligation, featured the up-regulation of cyclooxygenase-1 and prostaglandin E₂ receptors in the lumbar dorsal horn, and exaggerated A- and C-fiber-mediated reflex responses 24 h after injury. The latter effect was dependent on spinal prostaglandins derived primarily from cyclooxygenase-1.

■ ECONOMICS

- ◇ Gender Differences in Anesthesiologists' Annual Incomes 806

William B. Weeks, Amy E. Wallace, and Todd A. Mackenzie

This study found that, during the 1990s, female anesthesiologists had incomes that were 20% lower than that for males, after correcting for work effort, practice characteristics, and provider characteristics.

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Assessment of Competency in Anesthesiology 812

John E. Tetzlaff

The traditional approach to assessment in graduate medical education has changed from global evaluations to an assessment of competencies. This manuscript describes approaches to assessment and how competency assessment can interface with anesthesiology residency education.

■ SPECIAL ARTICLES

◆ We Are What We Make: Transforming Research in Anesthesiology. The 45th Rovenstine Lecture 826

J. G. Reves

An assessment of anesthesiology research and a plan to improve this performance are provided.

◆ Career National Institutes of Health Funding and Scholarship of Chairpersons of Academic Departments of Anesthesiology and Surgery 836

Deborah J. Culley, Gregory Crosby, Zhongcong Xie, Charles A. Vacanti, Richard J. Kitz, and Warren M. Zapol

Chairpersons of academic anesthesiology departments have received less National Institutes of Health funding and have fewer publications than chairs of academic departments of surgery.

◆ Practice Guidelines for Obstetric Anesthesia: An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia 843

The American Society of Anesthesiologists Task Force on Obstetric Anesthesia presents an updated practice guideline to enhance the quality of anesthetic care for obstetric patients, improve patient safety by reducing the incidence and severity of anesthesia-related complications, and increase patient satisfaction.

■ CLASSIC PAPERS REVISITED

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Clifford J. Woolf

This article is a revisiting of original material published as: Woolf CJ: Evidence for a central component of post-injury pain hypersensitivity. *Nature* 1983; 306:686-8.

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