



Anesthesiology



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■ CLINICAL INVESTIGATIONS

- ◆ **Lateral Position Decreases Collapsibility of the Passive Pharynx in Patients with Obstructive Sleep Apnea** **780**
Shiroh Isono, Atsuko Tanaka, and Takashi Nishino

Lateral position structurally improves maintenance of the passive pharyngeal airway in patients with obstructive sleep apnea and may be a useful treatment technique for less severe upper airway obstruction.

- ◆ **Collapsibility of the Upper Airway during Anesthesia with Isoflurane** **786**
Peter R. Eastwood, Irene Szollosi, Peter R. Platt, and David R. Hillman

This study measured the pressure-flow characteristics of the upper airway and accompanying electromyogram activity to assess its collapsibility in healthy subjects during anesthesia with isoflurane.

- ◆ **Effectiveness of Acute Normovolemic Hemodilution to Minimize Allogeneic Blood Transfusion in Major Liver Resections** **794**
Idit Matot, Olga Scheinin, Oded Jurim, and Ahmed Eid

Acute normovolemic hemodilution significantly reduced the need for allogeneic blood transfusion during major liver resection.

- Hypercapnia Improves Tissue Oxygenation** **801**
Ozan Akça, Anthony G. Doufas, Nobutada Morioka, Steve Iscoe, Joseph Fisher, and Daniel I. Sessler

We found that increasing P_{aCO_2} in healthy volunteers linearly raised their subcutaneous tissue oxygen tension and cardiac index. Since higher oxygen tension increases resistance to wound infections, our data suggest that mild hypercapnia may improve resistance to surgical wound infections.

- ◇ **Cortisol Response to Corticotropin Stimulation in Trauma Patients: Influence of Hemorrhagic Shock** **807**
Sophie Hoen, Karim Asehnoune, Sylvie Brailly-Tabard, Jean-Xavier Mazoit, Dan Benhamou, Pierre Moine, and Alain R. Edouard

A sustained impairment of adrenal reserve was observed following hemorrhagic shock in trauma patients and contributed to a prolonged need for vasopressor therapy.

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Does the A118G Polymorphism at the μ -opioid Receptor Gene Protect against Morphine-6-Glucuronide Toxicity?

814

Jörn Lötsch, Michael Zimmermann, Jutta Darimont, Claudia Marx, Rafael Dudziak, Carsten Skarke, and Gerd Geisslinger

The authors hypothesize that the A118G polymorphism of the μ -opioid receptor gene may protect against morphine-6-glucuronide (M6G) toxicity. Two patients with renal failure are presented; one was G118/G118 genotype and had no opioid side effects despite high plasma M6G, the other was A118/A118 "wild-type" genotype and suffered from M6G related toxicity.

◇ Goal-directed Intraoperative Fluid Administration Reduces Length of Hospital Stay after Major Surgery

820

Tong J. Gan, Andrew Soppitt, Mohamed Maroof, Habib El-Moalem, Kerri M. Robertson, Eugene Moretti, Peter Dwane, and Peter S. A. Glass

For patients undergoing moderate- and high-risk surgery, goal-directed fluid administration improves gastrointestinal function and reduces the length of hospital stay.

🌐 Input Characteristics and Bioavailability after Administration of Immediate and a New Extended-release Formulation of Hydromorphone in Healthy Volunteers

827

David R. Drover, Martin S. Angst, Marta Valle, Bhamini Ramaswamy, Sujata Naidu, Donald R. Stanski, and Davide Verotta

The release characteristics of a new OROS[®] formulation of hydromorphone were quantified using deconvolution methodology.

Hemostatic Activation and Inflammatory Response during Cardiopulmonary Bypass: Impact of Heparin Management

837

Andreas Koster, Thomas Fischer, Michael Praus, Helmut Haberzettl, Wolfgang M. Kuebler, Roland Hetzer, and Herman Kuppe

Compared with heparin management with the activated clotting time, heparin concentration-based anticoagulation management during cardiopulmonary bypass leads to a significant reduction of fibrinolysis, thrombin generation, and the inflammatory response, while there is no difference in fibrin formation and platelet activation.

Risk of Respiratory Complications and Wound Infection in Patients Undergoing Ambulatory Surgery: Smokers *versus* Nonsmokers

842

Paul S. Myles, George A. Iacono, Jennifer O. Hunt, Helen Fletcher, John Morris, David McIlroy, and Lin Fritschi

Smoking was associated with an increased risk of respiratory complications and postoperative wound infection in ambulatory surgery patients.



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■ LABORATORY INVESTIGATIONS

Effects of the Nonimmobilizer Hexafluoroethane on the Model Membrane Dimyristoylphosphatidylcholine 848

Laure Koubi, Mounir Tarek, Sanjoy Bandyopadhyay, Michael L. Klein, and Daphna Scharf

Molecular dynamics computer simulations have been carried out to probe the effects caused by the presence of the nonimmobilizer hexafluoroethane (HFE), an analog of the anesthetic halothane, on a dimyristoyl phosphatidyl choline (DMPC) membrane. HFE is found to exhibit a more uniform distribution along the lipid acyl chains compared with halothane, which has a distinct preference for the upper part of the chains, just below the head-groups. HFE causes the bilayer thickness to expand and the lateral area to contract, whereas halothane has the opposite effects.

Changes in the Effect of Isoflurane on *N*-methyl-D-aspartic Acid-gated Currents in Cultured Cerebral Cortical Neurons with Time in Culture: Evidence for Subunit Specificity 856

Zhen Ming, Benjamin L. Griffith, George R. Breese, Robert A. Mueller, and Hugh E. Criswell

Sensitivity to isoflurane of NMDA receptors on cultured cortical neurons changes with time in culture and with the ratio of NR2B-to-NR2A NMDA receptor subunits. Tachyphylaxis to inhibition of NMDA-gated currents by isoflurane occurs after one 10-s application.

◇ Early Effects of Acid-Base Management during Hypothermia on Cerebral Infarct Volume, Edema, and Cerebral Blood Flow in Acute Focal Cerebral Ischemia in Rats 868

Rainer Kollmar, Thomas Frietsch, Dimitrios Georgiadis, Wolf-Rüdiger Schäbitz, Klaus F. Waschke, Wolfgang Kuschinsky, and Stefan Schwab

Cerebral blood flow is increased by pH-stat management during prolonged moderate hypothermia in a model of transient focal cerebral ischemia compared with α -stat management. This effect is associated with decreased cerebral infarct volume and cerebral edema.

Hemodynamic Benefit of Positive End-expiratory Pressure during Acute Descending Aortic Occlusion 875

William E. Johnston, Brendan P. Conroy, Gregory S. Miller, Cheng Y. Lin, and Donald J. Deyo

Fifteen cm H₂O positive end-expiratory pressure (PEEP) reduces the hypertensive response to acute descending aortic occlusion in pigs. The combination of PEEP with volume expansion significantly attenuates declamp hypotension by maintaining stroke volume.

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Ketamine Stereoselectively Affects Vasorelaxation Mediated by ATP-sensitive K⁺ Channels in the Rat Aorta 882

Mayuko Dojo, Hiroyuki Kinoshita, Hiroshi Iranami, Katsutoshi Nakahata, Yoshiki Kimoto, and Yoshio Hatano

Clinically relevant concentrations of ketamine racemate but not S(+) ketamine reduce vasorelaxation induced by an ATP-sensitive K⁺ channel opener levromakalim in the isolated rat aorta.

Myeloperoxidase-associated Tyrosine Nitration after Intratracheal Administration of Lipopolysaccharide in Rats 887

Ryuji Hataishi, Hirosuke Kobayashi, Yuko Takahashi, Seishiro Hirano, Warren M. Zapol, and Rosemary C. Jones

As shown by neutrophil depletion, the myeloperoxidase pathway plays a major role in lung tissue nitration and chlorination in lipopolysaccharide-treated rats; NO inhalation decreases lung tissue nitration and chlorination *via* this pathway, possibly by reducing neutrophil sequestration.

Ischemic Preconditioning Is Capable of Inducing Mitochondrial Tolerance in the Rat Brain 896

Ren-Zhi Zhan, Hideyoshi Fujihara, Hiroshi Baba, Tomohiro Yamakura, and Koki Shimoji

Ischemic preconditioning is capable of inducing mitochondrial tolerance in the rat brain.

Heteromeric Nicotinic Inhibition by Isoflurane Does Not Mediate MAC or Loss of Righting Reflex 902

Pamela Flood, James M. Sonner, Diane Gong, and Kristen M. Coates

Nicotinic pharmacologic agents do not modify MAC or LORR induced by isoflurane.

◇ Sleep Deprivation Potentiates the Onset and Duration of Loss of Righting Reflex Induced by Propofol and Isoflurane 906

Avery Tung, Martin J. Szafran, Bryan Bluhm, and Wallace B. Mendelson

The effect of sleep deprivation on anesthetic potency was evaluated in a rat model. A 24-hour period of sleep deprivation significantly enhanced the ability of isoflurane and propofol to induce a defined state of reduced responsiveness to external stimuli.

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Sevoflurane Preconditioning before Moderate Hypothermic Ischemia Protects against Cytosolic $[Ca^{2+}]$ Loading and Myocardial Damage in Part *via* Mitochondrial K_{ATP} Channels 912

Qun Chen, Amadou K. S. Camara, Jianzhong An, Enis Novalija, Matthias L. Riess, and David F. Stowe

Sevoflurane given before hypothermic ischemia protects hearts against reperfusion injury. Sevoflurane preconditioning is associated with decreased Ca^{2+} loading and reduced infarct size mediated in part by mitochondrial K_{ATP} channel opening.

Kinetic Modulation of *HERG* Potassium Channels by the Volatile Anesthetic Halothane 921

Jichang Li and Ana M. Correa

Halothane inhibits *HERG* K^+ currents expressed in *Xenopus* oocytes by modulating kinetic properties of *HERG* channels, decreasing their open probability.

■ PAIN AND REGIONAL ANESTHESIA

Cost-efficacy of Rofecoxib *versus* Acetaminophen for Preventing Pain after Ambulatory Surgery 931

Tijani Issioui, Kevin W. Klein, Paul F. White, Mehernoor F. Watcha, Gary D. Skrivanek, Stephanie B. Jones, Jie Hu, Bradley F. Marple, and Caleb Ing

Oral premedication with rofecoxib (50 mg) was more effective than acetaminophen (2 g) in reducing postoperative pain and in improving the quality of recovery and patient satisfaction with pain management after outpatient otolaryngologic surgery.

Dose Response of Intrathecal Adenosine in Experimental Pain and Allodynia 938

James C. Eisenach, Regina Curry, and David D. Hood

Intrathecal injection of adenosine, 0.5 and 2.0 mg exhibited similar antiallodynic effects in an experimental model of mechanical hypersensitivity, but side effects were more common with 2.0 mg. Intravenous aminophylline failed to reverse adenosine's effects.



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Thomas Schricker, Linda Wykes, Leopold Eberhart, Ralph Lattermann, Louise Mazza, and Franco Carli

Epidural blockade accentuates the stimulating effect of parenteral administration of glucose and amino acids on whole body protein synthesis after surgery.

Postoperative Wound Oxygen Tension with Epidural or Intravenous Analgesia: A Prospective, Randomized, Single-blind Clinical Trial 952

Donal J. Buggy, Warren L. Doherty, Elaine M. Hart, and Edward J. Pallett

Patients receiving combined general and epidural anesthesia and continuous epidural analgesia for 24 hours have higher directly-measured, subcutaneous wound tissue oxygen tension than patients receiving general anesthesia with intravenous morphine analgesia.

Continuous Popliteal Sciatic Nerve Block for Postoperative Pain Control at Home: A Randomized, Double-Blinded, Placebo-Controlled Study 959

Brian M. Ilfeld, Timothy E. Morey, R. Doris Wang, and F. Kayser Enneking

This randomized, double-blinded, placebo-controlled study demonstrates that ropivacaine infused with a portable, mechanical pump *via* a sciatic perineural catheter in the popliteal fossa for 3 days at home significantly decreases postoperative pain after moderately painful orthopedic surgery of the lower extremity. In addition to providing potent analgesia, perineural ropivacaine infusion decreases oral opioid requirements, opioid-related side effects, and sleep disturbances, and increases patient satisfaction.

Pharmacology of Opioid Inhibition to Noxious Uterine Cervical Distension 966

Andreas Sandner-Kiesling, and James C. Eisenach

Uterine cervical distension-induced nocifensive reflexes are inhibited by central μ -opioid receptor activation and by nonclassical peripheral κ -opioid receptors.



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Patricia M. Lavand'homme, Weiya Ma, Marc De Kock, and James C. Eisenach

Peripheral nerve injury in rats results in an accumulation of α_{2A} adrenoceptors in neuronal and immune cells at the site of injury, and peripheral nerve block with clonidine alone in this model reduces mechanical hypersensitivity and abnormal expression of a gene transcription factor in the spinal cord.

■ ECONOMICS

PACU Bypass after Outpatient Knee Surgery Is Associated with Fewer Unplanned Hospital Admissions but More Phase II Nursing Interventions 981

Brian A. Williams, Michael L. Kentor, John P. Williams, Molly T. Vogt, Stacey V. DaPos, Christopher D. Harner, and Freddie H. Fu

Retrospective analysis of PACU bypass for outpatient knee surgery showed that the listed criteria predicted postoperative nursing interventions and unplanned hospital admissions.

■ REVIEW ARTICLE

◆ Practical Guidelines for Acute Care of Victims of Bioterrorism: Conventional Injuries and Concomitant Nerve Agent Intoxication 989

Ron Ben Abraham, Valery Rudick, and Avi A. Weinbroum

This overview represents an effort to establish cogent guidelines for administering acute medical care and anesthesia on a large scale for individuals suffering from both conventional injuries and intoxication by nerve agents, which are potent acetylcholinesterase inhibitors that cause cholinergic crisis. Understanding the interdependence between the toxic and the traumatic occurrences and the drugs that are used to prevent or treat intoxication by nerve agents is essential because they may further jeopardize the function of all organ systems in adult and pediatric populations and interfere with resuscitation protocols.

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John D. Michenfelder

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GUIDE FOR AUTHORS

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