



Anesthesiology



The Journal of the American Society of Anesthesiologists, Inc.
 American Society of Critical Care Anesthesiologists
 Society for Obstetric Anesthesia and Perinatology



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Tanja A. Treschan, Christian Zimmer, Christoph Nass, Bernd Stegen, Joachim Esser, and Jürgen Peters
- An inspired oxygen fraction of 0.8 during general anesthesia does not diminish postoperative nausea and vomiting in patients undergoing strabismus repair.

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- Attenuated Brain Response to Auditory Word Stimulation with Sevoflurane: A Functional Magnetic Resonance Imaging Study in Humans** **11**
- Chantal Kerssens, Stephan Hamann, Scott Peltier, Xiaoping P. Hu, Michael G. Byas-Smith, and Peter S. Sebel*
- Using functional magnetic resonance imaging, the authors studied brain activation in response to auditory word stimuli in healthy volunteers breathing 0.0, 2.0, and 1.0% end-tidal sevoflurane. After recovery, recognition memory for presented stimuli was tested.
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- Sympathetic and Hemodynamic Effects of Moderate and Deep Sedation with Propofol in Humans** **20**
- Thomas J. Ebert*
- Sedative doses of propofol inhibit sympathetic nerve activity, leading to substantial decreases in blood pressure.
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- ◇ **Effect of Intraoperative Fluid Management on Outcome after Intraabdominal Surgery** **25**
- Vadim Nisanevich, Itamar Felsenstein, Gidon Almogy, Charles Weissman, Sharon Einav, and Idit Matot*
- In patients undergoing elective intraabdominal surgery, intraoperative use of restrictive fluid management may be advantageous because it reduces postoperative morbidity and shortens hospital stay.
-
- ◇ **Management of the Difficult Airway: A Closed Claims Analysis** **33**
- Gene N. Peterson, Karen B. Domino, Robert A. Caplan, Karen L. Posner, Lorri A. Lee, and Frederick W. Cheney*
- Death or brain damage in claims from difficult airway management associated with induction of anesthesia but not other phases of anesthesia decreased in 1993–1999 compared with 1985–1992. Development of additional management strategies for difficult airways encountered during maintenance, emergence, or recovery from anesthesia may improve patient safety.

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■ LABORATORY INVESTIGATIONS

- ◆ **Anaphylactic Shock: A Form of Distributive Shock without Inhibition of Oxygen Consumption** 40

Pascale Dewachter, Valérie Jouan-Hureaux, Patricia Franck, Patrick Menu, Nicole de Talancé, Faiez Zannad, Marie-Claire Laxenaire, Dan Longrois, and Paul Michel Mertes

Ovalbumin-induced anaphylactic shock in sensitized anesthetized rats resulted in severe reduction of skeletal muscle blood flow. However, persistent oxygen consumption results in rapidly decreased tissue oxygen partial pressure and rapid substrate depletion through anaerobic glycolysis, leading to complete failure of cellular energy production. This profile could explain the difficulties to restore cardiovascular homeostasis when anaphylactic shock occurs even in previously apparently healthy anesthetized patients.

- Sevoflurane Depresses Glutamatergic Neurotransmission to Brainstem Inspiratory Premotor Neurons but Not Postsynaptic Receptor Function in a Decerebrate Dog Model** 50

Astrid G. Stucke, Edward J. Zuperku, Viseslav Tonkovic-Capin, Mirko Krolo, Francis A. Hopp, John P. Kampine, and Eckehard A. E. Stuth

A decerebrate dog model shows that sevoflurane depresses the activity of inspiratory premotor neurons in the ventral respiratory group *via* reduction of overall glutamatergic excitation, whereas postsynaptic glutamate receptor function remains unaltered.

- Sevoflurane Enhances γ -Aminobutyric Acid Type A Receptor Function and Overall Inhibition of Inspiratory Premotor Neurons in a Decerebrate Dog Model** 57

Astrid G. Stucke, Edward J. Zuperku, Mirko Krolo, Ivo F. Brandes, Francis A. Hopp, John P. Kampine, and Eckehard A. E. Stuth

A decerebrate dog model shows that sevoflurane greatly enhances γ -aminobutyric acid type A receptor function in inspiratory premotor neurons in the ventral respiratory group. Overall synaptic inhibition is enhanced to a much lesser extent, which suggests that sevoflurane also reduces presynaptic inhibitory input to these neurons.

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Pyruvate Modulates Hepatic Mitochondrial Functions and Reduces Apoptosis Indicators during Hemorrhagic Shock in Rats 65

Pushpa Sharma, Kane T. Walsh, Kimberly A. Kerr-Knott, John E. Karaian, and Paul D. Mongan

The protective effects of exogenous pyruvate in preventing hemorrhagic shock-mediated liver injury can be attributed to increases in cellular energetic levels through its antioxidant and antinitrosyl properties and prevention of mitochondrial damage.

Role of Endothelial Nitric Oxide Synthase as a Trigger and Mediator of Isoflurane-induced Delayed Preconditioning in Rabbit Myocardium 74

Pascal C. Chiari, Martin W. Bienengraeber, Dorothee Wehrauch, John G. Krolikowski, Judy R. Kersten, David C. Warltier, and Paul S. Pagel

Delayed preconditioning by isoflurane is triggered and mediated by endothelial but not inducible or neuronal nitric oxide synthase in a rabbit model of ischemia and reperfusion injury.

Neuroprotective Effect of Epidural Electrical Stimulation against Ischemic Spinal Cord Injury in Rats: Electrical Preconditioning 84

Manabu Kakinohana, Hideki Harada, Yasunori Mishima, Tatsuhiko Kano, and Kazuhiro Sugahara

Although the optimal setting for this electrical preconditioning should be determined in future studies, the authors' results suggest that epidural electrical stimulation will be a useful approach to provide spinal protection against ischemia.

Differential Inhibition of Neuronal Na^+ - Ca^{2+} Exchange *versus* Store-operated Ca^{2+} Channels by Volatile Anesthetics in Pheochromocytoma (PC12) Cells 93

Binnaz Ay, Daniel Wallace, Carlos B. Mantilla, and Yedotore S. Prakash

In a pheochromocytoma neuronal cell model, clinically relevant concentrations of halothane, isoflurane, and sevoflurane are found to inhibit Ca^{2+} influx mode of Na^+ - Ca^{2+} exchange but not the novel store-operated Ca^{2+} influx mechanism.

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Local Anesthetic Interaction with Human *Ether-a-go-go*-related Gene (HERG) Channels: Role of Aromatic Amino Acids Y652 and F656 **102**

Cornelia C. Siebrands, Nicole Schmitt, and Patrick Friederich

Amino-amide local anesthetics share a common site of interaction with human *ether-a-go-go*-related gene (HERG) potassium channels. Bupivacaine, ropivacaine, and mepivacaine specifically but not exclusively interact with the aromatic residues Y652 and F656 in S6.

■ **PAIN AND REGIONAL ANESTHESIA**

◆ **Reduction of Postincisional Allodynia by Subcutaneous Bupivacaine: Findings with a New Model in the Hairy Skin of the Rat** **113**

Adriana M. Duarte, Eva Pospisilova, Erin Reilly, Florence Mujenda, Yoshihiro Hamaya, and Gary R. Strichartz

An incision through the hairy skin of the rat produces primary and secondary tactile allodynia and hyperalgesia that last for a week. Subcutaneous bupivacaine (0.25%) that anesthetizes skin for 2–4 h, injected before the incision at the site or far away, suppresses primary allodynia and virtually abolishes secondary allodynia with little effect on hyperalgesia. Therefore, bupivacaine acts locally and systemically to reduce postincisional pain.

A Comparative Study of Sequential Epidural Bolus Technique and Continuous Epidural Infusion **126**

Kenichi Ueda, Wasa Ueda, and Masanobu Manabe

The efficacy of sequential epidural bolus technique was studied. Sequential epidural bolus technique significantly improved epidural analgesia compared with continuous epidural infusion.

Alfentanil and Placebo Analgesia: No Sex Differences Detected in Models of Experimental Pain **130**

Erik Olofsen, Raymonda Romberg, Hans Bijl, René Mooren, Frank Engbers, Benjamin Kest, and Albert Dahan

In healthy male and female volunteers, analgesic (assessed with electrical and heat pain) and sedative responses to alfentanil and a placebo control were quantified using a pharmacokinetic–pharmacodynamic modeling approach and compared. There were no sex differences in alfentanil and placebo analgesia, and there was a significantly greater blood–effect site equilibration half-life in the electrical pain test (7–9 min) than in the heat pain test (0.4 min) and sedation (2 min).

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Topical 2% Amitriptyline and 1% Ketamine in Neuropathic Pain Syndromes: A Randomized, Double-blind, Placebo-controlled Trial **140**

Mary E. Lynch, Alexander J. Clark, Jana Sawynok, and Michael J. L. Sullivan

This randomized controlled trial examined the analgesic action of topical 2% amitriptyline, 1% ketamine, and a combination of both in the treatment of a mixed group of patients with neuropathic pain. The study revealed no differences between groups.

◇ **Remifentanyl-induced Postoperative Hyperalgesia and Its Prevention with Small-dose Ketamine** **147**

Vincent Joly, Philippe Richebe, Bruno Guignard, Dominique Fletcher, Pierre Maurette, Daniel I. Sessler, and Marcel Chauvin

A relatively large dose of intraoperative remifentanyl triggered postoperative secondary hyperalgesia. Remifentanyl-induced hyperalgesia was prevented by small-dose ketamine, implicating an *N*-methyl-D-aspartate pain-facilitator process.

◇ **Sex- and Age-related Differences in Morphine Requirements for Postoperative Pain Relief** **156**

Frédéric Aubrun, Nadège Salvi, Pierre Coriat, and Bruno Riou

Analyzing 4,317 patients who received intravenous morphine titration in the immediate postoperative period, the authors observed that women experienced more pain and required a greater dose of morphine than men (+11%). This sex-related difference disappeared in elderly (aged > 75 yr) patients.

■ **ECONOMICS**

Financial Implications of a Hospital's Specialization in Rare Physiologically Complex Surgical Procedures **161**

Ruth E. Wachtel, Franklin Dexter, and David A. Lubarsky

Inpatient and outpatient discharge abstract data have been combined with hospital and professional practice accounting data to determine the financial impact of rare surgical procedures performed by a hospital and the unique role it plays in its region's healthcare system.

■ **REVIEW ARTICLE**

◻ **Primer of Postoperative Pruritus for Anesthesiologists** **168**

Beverly Waxler, Zerín P. Dadabhoy, Ljuba Stojiljkovic, Sara F. Rabito

Understanding the underlying mechanisms of pruritus helps to effectively treat postoperative itching.

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■ SPECIAL ARTICLES

- ◆ **From the FDA: What's in a Label? A Guide for the Anesthesia Practitioner** **179**

Nancy S. Chang, Arthur F. Simone, and Lex W. Schultheis

Physicians should read the contents of drug labels and understand the bases of drug labeling along with the potential implications of off-label use of medications.

- ⊗ **Practice Advisory for the Perioperative Management of Patients with Cardiac Rhythm Management Devices: Pacemakers and Implantable Cardioverter-Defibrillators: A Report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Cardiac Rhythm Management Devices**

The American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Cardiac Rhythm Management Devices: Pacemakers and Implantable Cardioverter-Defibrillators presents a practice advisory to facilitate the safe and effective perioperative management of these patients.

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Ronald Melzack

This article is a revisiting of original material published as: Melzack R, Torgerson WS: On the language of pain. *ANESTHESIOLOGY* 1971; 34:50-9.

■ CASE REPORT

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