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■ CLINICAL INVESTIGATIONS

◆◆ **Differential Dynamic of Action on Cortical and Subcortical Structures of Anesthetic Agents during Induction of Anesthesia** 202

Lionel J. Velly, Marc F. Rey, Nicolas J. Bruder, François A. Gouvitsos, Tatiana Witjas, Jean Marie Regis, Jean Claude Peragut, and François M. Guoin

The authors describe the dynamic action of anesthetic agents during induction of anesthesia at cortical and subcortical levels and compare the involvement of these two structures in loss of consciousness and movement in response to noxious stimuli in patients with Parkinson disease previously implanted with a deep-brain stimulation electrode.

◆ **Incidence of Intraoperative Hypotension as a Function of the Chosen Definition: Literature Definitions Applied to a Retrospective Cohort Using Automated Data Collection** 213

Jilles B. Bijker, Wilton A. van Klei, Teus H. Kappen, Leo van Wolfswinkel, Karel G. M. Moons, and Cor J. Kalkman

Intraoperative hypotension is a frequent side effect of anesthesia and may contribute to adverse outcomes. However, many definitions can be found in the literature. With these definitions, incidences between 5% and 99% could be reproduced.

CME ◆ **Avoidance of Nitrous Oxide for Patients Undergoing Major Surgery: A Randomized Controlled Trial** 221

Paul S. Myles, Kate Leslie, Matthew T. V. Chan, Andrew Forbes, Michael J. Paech, Philip Peyton, Brendan S. Silbert, Elaine Pascoe, and the ENIGMA Trial Group

Nitrous oxide is widely administered as part of the gas mixture for anesthesia. This study found that avoidance of nitrous oxide decreased the incidence of major complications without decreasing hospital duration of stay.

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CME CME Article

Assessment of the Accuracy of Procalcitonin to Diagnose Postoperative Infection after Cardiac Surgery 232

Mohamed Adel Jebali, Pierre Hausfater, Zoubeir Abbas, Zied Aouni, Bruno Riou, and Mustapha Ferjani

Procalcitonin is an early and specific biologic marker of infection in patients undergoing cardiac surgery, a value greater than 1.5 ng/ml beyond the second postoperative day being strongly predictive of an infectious complication.

Reversal of Rocuronium-induced (1.2 mg/kg) Profound Neuromuscular Block by Sugammadex: A Multicenter, Dose-finding and Safety Study 239

Hans D. de Boer, Jacques J. Driessen, Marco A. E. Marcus, Hans Kerckamp, Marten Heeringa, and Markus Klimek

In this multicenter, dose-finding and safety study in surgical patients, sugammadex was shown to effectively and rapidly reverse profound neuromuscular block induced by 1.2 mg/kg rocuronium, without apparent side effects.

 **Skin Reactions to Intradermal Neuromuscular Blocking Agent Injections: A Randomized Multicenter Trial in Healthy Volunteers** 245

Paul Michel Mertes, Denise Anne Moneret-Vautrin, Francisque Leynadier, and Marie-Claire Laxenaire

Dose-response relations of neuromuscular blocking agents injected intradermally in healthy volunteers are reported. Results are compared with maximal concentrations recommended for the diagnosis of sensitization to these drugs in case of immediate hypersensitivity reaction during anesthesia.

Immunoglobulin E Antibodies to Rocuronium: A New Diagnostic Tool 253

Didier G. Ebo, Lennart Venemalm, Chris H. Bridts, Frederik Degerbeck, Hans Hagberg, Luc S. De Clerck, and Wim J. Stevens

The rocuronium ImmunoCAP (Phadia AB, Uppsala, Sweden) constitutes a reliable technique to diagnose rocuronium allergy, provided application of an assay-specific threshold. Quaternary ammonium-based immunoglobulin E assays represent reliable tools to diagnose rocuronium allergy. High total immunoglobulin E affects specificity of the assays.

Uppermost Blood Levels of the Right and Left Atria in the Supine Position: Implication for Measuring Central Venous Pressure and Pulmonary Artery Wedge Pressure 260

Jeong-Hwa Seo, Chul-Woo Jung, and Jae-Hyon Bahk

The reference level of central venous pressure is positioned approximately 4.6 cm higher than that of pulmonary artery wedge pressure in the supine position.

■ **LABORATORY INVESTIGATIONS**

◆◆ **Thalamic Microinjection of Nicotine Reverses Sevoflurane-induced Loss of Righting Reflex in the Rat** 264

Michael T. Alkire, Jayme R. McReynolds, Emily L. Hahn, and Akash N. Trivedi

Sevoflurane-induced unconsciousness in the rat can be blocked with a microinfusion of nicotine into the central medial thalamus, suggesting suppression of endogenous cholinergic arousal mechanisms play a role in mediating the hypnotic component of anesthesia.

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Resuscitation with Recombinant Hemoglobin rHb2.0 in a Rodent Model of Hemorrhagic Shock 273

Joerg Hermann, Carlos Corso, and Konrad F. Messmer

Both recombinant hemoglobin (rHb) 1.1 and rHb2.0 were superior to dextran 60 in restoring macrohemodynamics and normalizing respiratory and metabolic parameters, but the absence of vasoactivity in rHb2.0 allowed for the best translation from macrohemodynamic into microcirculatory recovery.

The Novel Hemoglobin-based Oxygen Carrier HRC 101 Improves Survival in Murine Sickle Cell Disease 281

Mark W. Crawford, Tal Shichor, Thomas Engelhardt, Gord Adamson, David Bell, F. J. Lou Carmichael, and Peter C. W. Kim

Administration of the novel hemoglobin-based oxygen carrier HRC 101 significantly decreased sickle-related mortality during exposure to acute hypoxic stress in transgenic mice expressing hemoglobin SAD ($\alpha_2^{\text{human}}\beta_2^{\text{S,Antilles,D-Punjab}}$).

Activation of Opioid μ Receptors in Caudal Medullary Raphe Region Inhibits the Ventilatory Response to Hypercapnia in Anesthetized Rats 288

Zhenxiong Zhang, Fadi Xu, Cancan Zhang, and Xiaomin Liang

The authors' results suggest that μ receptors in the caudal, but not middle or rostral, medullary raphe region are important but not exclusive for attenuating the hypercapnic ventilatory response.

■ PAIN AND REGIONAL ANESTHESIA

Ejaculatory Pain: A Specific Postherniotomy Pain Syndrome? 298

Eske K. Aasvang, Bo Møhl, and Henrik Kehlet

This article describes a cohort study of patients with chronic ejaculatory pain after groin hernia surgery. Ejaculatory pain is most likely a neuropathic pain state due to intraoperative damage to the vas deferens or nerves.

The Quaternary Lidocaine Derivative, QX-314, Produces Long-lasting Local Anesthesia in Animal Models *In Vivo* 305

Tony K. Y. Lim, Bernard A. MacLeod, Craig R. Ries, and Stephan K. W. Schwarz

In this laboratory study, the quaternary lidocaine derivative QX-314 concentration-dependently and reversibly produced long-lasting local anesthesia with a slow onset in animal models *in vivo*. The results challenge the notion that quaternization obliterates extracellular local anesthetic activity.

Nerve Conduction Blockade in the Sciatic Nerve Prevents but Does Not Reverse the Activation of p38 Mitogen-activated Protein Kinase in Spinal Microglia in the Rat Spared Nerve Injury Model 312

Yeong-Ray Wen, Marc R. Suter, Yasuhiko Kawasaki, Jin Huang, Marie Pertin, Tatsuro Kohno, Charles B. Berde, Isabelle Decosterd, and Ru-Rong Ji

Peripheral spontaneous activity generated after nerve injury is required for initial activation of p38 mitogen-activated protein kinase in spinal microglia, and this activation is essential for the development of neuropathic pain.

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Local Inflammation in Rat Dorsal Root Ganglion Alters Excitability and Ion Currents in Small-diameter Sensory Neurons 322

Jun-Gang Wang, Judith A. Strong, Wenrui Xie, and Jun-Ming Zhang

Localized inflammation of the dorsal root ganglia in rats leads to increases in voltage-gated potassium and sodium current densities, and an overall increase in excitability, in acutely isolated small-diameter sensory neurons.

■ **REVIEW ARTICLE**

◆ **Transesophageal Echocardiography and Cardiovascular Sources of Embolism: Implications for Perioperative Management** 333

Christine Ngukhoo Tan and Alan G. Fraser

The authors describe how transesophageal echocardiography is invaluable for detecting various cardiovascular sources of embolism and for refining perioperative clinical decision making. Embolic sources include intracardiac thrombi, vegetations, and tumors; cardiac anomalies; and aortic disease.

■ **CASE REPORTS**

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James E. Heavner, David E. Wyatt, and Hemmo A. Bosscher

Delayed Onset of Malignant Hyperthermia without Creatine Kinase Elevation in a Geriatric, Ryanodine Receptor Type 1 Gene Compound Heterozygous Patient 350

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