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Can Attenuation of the Perioperative Stress Response Prevent Intermediate or Long-term Cardiovascular Outcomes among Patients Undergoing Noncardiac Surgery?

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■ PERIOPERATIVE MEDICINE

◆ Desflurane Selectively Suppresses Long-latency Cortical Neuronal Response to Flash in the Rat

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Anthony G. Hudetz, Jeannette A. Vizueté, and Olga A. Imas

Desflurane at increasing inhaled concentrations from 2% to 8% selectively suppresses the long-latency response of visual cortical neurons to flash stimulation while the middle latency neuronal response is preserved.

◆ Methoxycarbonyl-etomidate: A Novel Rapidly Metabolized and Ultra-short-acting Etomidate Analogue that Does Not Produce Prolonged Adrenocortical Suppression

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Joseph F. Cotten, S. Shaukat Husain, Stuart A. Forman, Keith W. Miller, Elizabeth W. Kelly, Hieu H. Nguyen, and Douglas E. Raines

These investigators studied the pharmacology of (R)-3-methoxy-3-oxopropyl-1-(1-phenylethyl)-1H-imidazole-5-carboxylate (MOC-etomidate), an etomidate analogue designed to be susceptible to ultra-rapid metabolism in experimental animals. MOC-etomidate potently enhanced γ -aminobutyric acid type A receptor function and produced loss of righting reflex. Metabolism was first order with an *in vitro* half-life of 4.4 min *versus* more than 40 min for etomidate. MOC-etomidate produced rapid and extremely brief loss of righting reflex and caused minimal hemodynamic changes. Unlike etomidate, MOC-etomidate produced no adrenocortical suppression 30 min after bolus administration. MOC-etomidate retains etomidate's important favorable pharmacologic properties, is ultra-short-acting, and does not produce prolonged adrenocortical suppression after bolus administration.

Simultaneous Measurement of Cardiac Troponin I, B-type Natriuretic Peptide, and C-reactive Protein for the Prediction of Long-term Cardiac Outcome after Cardiac Surgery

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Jean-Luc Fellahi, Jean-Luc Hanouz, Yannick Le Manach, Xavier Gué, Emmanuel Monier, Louis Guillou, and Bruno Riou

Simultaneous measurement of postoperative cardiac troponin I, B-type natriuretic peptide, and C-reactive protein improve the risk assessment of long-term adverse cardiac outcome after cardiac surgery.

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- Expression of Signal Transduction Genes Differs after Hypoxic or Isoflurane Preconditioning of Rat Hippocampal Slice Cultures** 258
Philip E. Bickler and Christian S. Fahlman
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- Anesthetic-induced Preconditioning Delays Opening of Mitochondrial Permeability Transition Pore *via* Protein Kinase C- ϵ -mediated Pathway** 267
Danijel Pravdic, Filip Sedlic, Yasushi Mio, Nikolina Vladic, Martin Bienengraeber, and Zeljko J. Bosnjak
 Protein kinase C- ϵ mediates isoflurane-induced delay in mitochondrial permeability transition pore opening.
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Jang Ho Roh, Deok Won Kim, Sung Jin Lee, Ji Young Kim, Sung Won Na, Seung Ho Choi, and Ki Jun Kim
 Anesthesiologists are overexposed to extremely low-frequency electromagnetic fields by more than 2 mG for more than 70% of their working time.
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Masanori Haba, Hiroyuki Kinoshita, Naoyuki Matsuda, Toshiharu Azma, Keiko Hama-Tomioka, Noboru Hatakeyama, Mitsuaki Yamazaki, and Yoshio Hatano
 Thromboxane A₂ induces oxidative stress *via* nicotinamide adenine dinucleotide phosphate oxidase, resulting in the impairment of vascular adenosine triphosphate-sensitive K⁺ channel function. Propofol reduces this oxidative stress *via* inhibition of nicotinamide adenine dinucleotide phosphate oxidase and, therefore, restores adenosine triphosphate-sensitive K⁺ channel function.
- End-tidal Sevoflurane and Halothane Concentrations during Simulated Airway Occlusion in Healthy Humans** 287
Nick P. Talbot, Andrew D. Farmery, and Keith L. Dorrington
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-  **Analysis of Memory Formation during General Anesthesia (Propofol/Remifentanyl) for Elective Surgery Using the Process-dissociation Procedure** 293
Daniel A. Hadzidiakos, Nadja Horn, Roland Degener, Axel Buchner, and Benno Rehberg
 The interpretation of data obtained using the process-dissociation procedure concerning memory for information presented during general anesthesia depends on the measurement model used.
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 Exposure to general anesthesia during Cesarean delivery was not associated with development of learning disabilities, however, children born with Cesarean delivery and regional anesthesia had lower rate of learning disabilities.

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- ◇ **Prognostic Value of Brain Natriuretic Peptide in Noncardiac Surgery: A Meta-analysis** 311
Alisdair D. S. Ryding, Saurabh Kumar, Angela M. Worthington, and David Burgess
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- 🌐 **Performance Improvement System and Postoperative Corneal Injuries: Incidence and Risk Factors** 320
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William M. Weightman, Neville M. Gibbs, Matthew R. Sheminant, Mark A. J. Newman, and Dianne E. Grey
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- Supraclavicular Approach Is an Easy and Safe Method of Subclavian Vein Catheterization Even in Mechanically Ventilated Patients: Analysis of 370 Attempts** 334
Tomasz Czarnik, Ryszard Gawda, Tadeusz Perkowski, and Rafal Weron
 Subclavian venous catheterization *via* the supraclavicular approach is an excellent method of central venous access, even in mechanically ventilated patients. The procedure success rate and the significant complication rate are comparable to other techniques of central venous catheterization.
- General Anesthesia Increases Temporal Precision and Decreases Power of the Brainstem Auditory-evoked Response-related Segments of the Electroencephalogram** 340
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- Influence of Vancomycin on Renal Function in Critically Ill Patients after Cardiac Surgery: Continuous *versus* Intermittent Infusion** 356
Doris Hutschala, Christian Kinstner, Keso Skhirdladze, Florian Thalhammer, Markus Müller, and Edda Tschernko
 The intermittent and also the continuous application modality of vancomycin are associated with deterioration of renal function in critically ill patients. However, continuous infusion of vancomycin showed the tendency to be less nephrotoxic.

◇ **Oxygen Tissue Saturation Is Lower in Nonsurvivors than in Survivors after Early Resuscitation of Septic Shock** 366

Marc Leone, Sami Bliidi, François Antonini, Bertrand Meyssignac, Sébastien Bordon, Frédéric Garcin, Aude Charvet, Valéry Blasco, Jacques Albanèse, and Claude Martin

The assessment of microcirculation impairment is a key element in septic shock. This study shows that a value of tissue oxygen saturation below 78% after an early resuscitation is associated with an increased mortality in septic shock patients.

■ **PAIN MEDICINE**

Lumbar Sympathetic Blockade in Children with Complex Regional Pain Syndromes: A Double Blind Placebo-controlled Crossover Trial 372

Petra M. Meier, David Zurakowski, Charles B. Berde, and Navil F. Sethna

In a randomized controlled trial of children with Complex Regional Pain Syndrome, lumbar sympathetic blockade produced significant reduction of verbal pain scores and allodynia to brush and temporal summation compared with treatment with intravenous lidocaine.

Axotomy Depletes Intracellular Calcium Stores in Primary Sensory Neurons 381

Marcel Rigaud, Geza Gemes, Paul D. Weyker, James M. Cruikshank, Takashi Kawano, Hsiang-En Wu, and Quinn H. Hogan

Axotomy of primary sensory neurons reduces endoplasmic reticulum Ca^{2+} stores sensitive to ryanodine receptor activation, sarco-endoplasmic reticulum ATPase blockade, or Ca^{2+} ionophore application. Endoplasmic reticulum Ca^{2+} concentration is also reduced by injury.

Depletion of Calcium Stores in Injured Sensory Neurons: Anatomic and Functional Correlates 393

Geza Gemes, Marcel Rigaud, Paul D. Weyker, Stephen E. Abram, Dorothee Weihrauch, Mark Poroli, Vasiliki Zoga, and Quinn H. Hogan

Anatomic loss of endoplasmic reticulum contributes to diminished Ca^{2+} stores in injured primary sensory neurons, causing diminished Ca^{2+} -induced Ca^{2+} release and neuronal hyperexcitability.

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Clonidine as an Adjuvant to Local Anesthetics for Peripheral Nerve and Plexus Blocks: A Meta-analysis of Randomized Trials 406

Daniel M. Pöpping, Nadia Elia, Emmanuel Marret, Manuel Wenk, and Martin R. Tramèr

Clonidine added to intermediate or long-acting local anesthetics for single-shot peripheral nerve or plexus blocks prolongs duration of analgesia and motor block by about 2 h but increases the risk of hypotension, fainting, and sedation.

Intravenous Infusion Tests Have Limited Utility for Selecting Long-term Drug Therapy in Patients with Chronic Pain: A Systematic Review 416

Steven P. Cohen, Shruti G. Kapoor, and James P. Rathmell

Intravenous infusion tests were found to have limited utility for predicting long-term treatment response with oral or transdermal analogues.

■ CLINICAL CONCEPTS AND COMMENTARY

Anesthesia for Noncardiac Surgery in Adults with Congenital Heart Disease 432

Maxime Cannesson, Michael G. Earing, Vincent Collange, and Judy R. Kersten

For the first time in history, the number of adults with congenital heart disease exceeds that of children. Many of these patients will require noncardiac surgery. The perioperative implications are reviewed.

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