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ANESTHESIOLOGY

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Perioperative Medicine

CLINICAL SCIENCE

◆ Perioperative Use of Gabapentinoids for the Management of

Postoperative Acute Pain: A Systematic Review and Meta-analysis

M. Verret, F. Lauzier, R. Zarychanski, C. Perron, X. Savard, A.-M. Pinard, G. Leblanc, M.-J. Cossi, X. Neveu, A. F. Turgeon, and the Canadian Perioperative Anesthesia Clinical Trials (PACT) Group265

In a meta-analysis of 281 randomized controlled trials comparing gabapentinoids with controls, no clinically meaningful difference in acute, subacute, or chronic pain was observed. Although the risk of postoperative nausea and vomiting was slightly lower, adverse events of dizziness and visual disturbance were greater with gabapentinoids use. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◆ Electroencephalogram Burst-suppression during Cardiopulmonary Bypass in Elderly Patients Mediates Postoperative Delirium

J. C. Pedemonte, G. S. Plummer, S. Chamadia, J. J. Locascio, E. Hahn, B. Ethridge, J. Gitlin, R. Ibala, J. Mekonnen, K. M. Colon, M. B. Westover, D. A. D'Alessandro, G. Tolis, T. Houle, K. T. Shelton, J. Qu, O. Akeju280

In a retrospective observational substudy of 159 patients undergoing cardiac surgery, there is evidence that burst-suppression during cardiopulmonary bypass mediates the effect of physical function, temperature during cardiopulmonary bypass, and intraoperative electroencephalographic alpha power on postoperative delirium. Delirium was also associated with decreased broadband power in the intraoperative electroencephalogram. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◆ Goal-directed *versus* Standard Fluid Therapy to Decrease Ileus after Open Radical Cystectomy: A Prospective Randomized Controlled Trial

V. Arslan-Carlon, K. S. Tan, G. Dalbagni, A. C. Pedoto, H. W. Herr, B. H. Bochner, E. K. Cha, T. F. Donahue, M. Fischer, S. M. Donat293

In a randomized trial of goal-directed *versus* standard fluid therapy in patients having radical cystectomy, there was no difference in the primary outcome of postoperative ileus. There was no difference between fluid therapies in the secondary outcome of high-grade complications. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

◆ Refers to This Month in ANESTHESIOLOGY

◆ Refers to Editorials

◆ This article has an Audio Podcast

◆ See Supplemental Digital Content

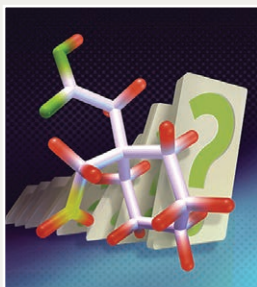
CME Article

◆ This article has a Video Abstract

◆ Part of the Letheon writing competition



◆ This article has a Visual Abstract

◆ Readers' Toolbox



ON THE COVER: Gabapentinoids are widely used in the perioperative period for acute pain management, yet the clinical benefit is uncertain. In this issue of ANESTHESIOLOGY, Verret *et al.* present a systematic review and meta-analysis analyzing the analgesic efficacy and adverse events with the perioperative use of gabapentinoids in adult patients. In an accompanying Editorial, Kharasch *et al.* review the evolution of use of perioperative gabapentinoids and conclude that evidence-based practice impels revising if not eliminating the routine use of perioperative gabapentinoids in adults. Cover Illustration: A. Johnson, Vivo Visuals.


- Verret *et al.*: Perioperative Use of Gabapentinoids for the Management of Postoperative Acute Pain: A Systematic Review and Meta-analysis, p. 265
- Kharasch *et al.*: Perioperative Gabapentinoids: Deflating the Bubble, p. 251

-   **Ephedrine versus Phenylephrine Effect on Cerebral Blood Flow and Oxygen Consumption in Anesthetized Brain Tumor Patients: A Randomized Clinical Trial**
K. U. Koch, I. K. Mikkelsen, J. Aanerud, U. S. Espelund, A. Tietze, G. v. Oettingen, N. Juul, L. Nikolajsen, L. Østergaard, M. Rasmussen.....304



In adult patients with brain tumors, there were no differences in cerebral metabolic rate of oxygen in peritumoral regions or in the contralateral cerebral hemisphere after administration of ephedrine or phenylephrine. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

-  **Muscular Tissue Oxygen Saturation and Posthysterectomy Nausea and Vomiting: The iMODIPONV Randomized Controlled Trial**
G. Li, D.-D. Tian, X. Wang, X. Feng, W. Zhang, J. Bao, D.-X. Wang, Y.-Q. Ai, Y. Liu, M. Zhang, M. Xu, D.-L. Mu, X. Zhao, F. Dai, J.-J. Yang, X. Che, D. Yanez, X. Guo, L. Meng, on behalf of the iMODIPONV Research Group.....318



Eight hundred relatively young women having laparoscopic hysterectomies were randomized to routine care or to muscle tissue oxygenation maintained at greater than baseline or 70%, whichever was higher. Guided management improved tissue oxygenation but did not reduce nausea and vomiting. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

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A systems theoretic process analysis identified unsafe control actions linked to causal scenarios that could lead to medication errors. Scenarios came from perioperative leadership, management of patient care, and execution of patient care. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

-   **Substance Use Disorder in Physicians after Completion of Training in Anesthesiology in the United States from 1977 to 2013**
D. O. Warner, K. Berge, H. Sun, A. Harman, T. Wang.....342

The estimated cumulative 30-yr incidence of substance abuse among graduates of U.S. residency programs is about 1.6%, with opioids and alcohol being the most commonly abused substances. A substantial proportion of anesthesiologists who develop substance use disorder die of the condition, and the risk of relapse is high in those who survive at approximately 40%.

-   **Enhanced Recovery after Lumbar Spine Fusion: A Randomized Controlled Trial to Assess the Quality of Patient Recovery**
E. M. Soffin, J. D. Beckman, A. Tseng, H. Zhong, R. C. Huang, M. Urban, C. R. Guheen, H.-J. Kim, F. P. Cammisa, J. A. Nejim, F. J. Schwab, I. F. Armendi, S. G. Memtsoudis.....350


Use of an enhanced recovery pathway for patients undergoing one- or two-level lumbar spinal fusion was associated with higher (better) Quality of Recovery-40 scores 3 days after surgery. This difference was not deemed clinically significant, however. Several secondary endpoints including time to oral intake, duration of patient-controlled analgesia use, and day 1 opioid consumption were improved by use of the enhanced recovery pathway. Further refinement of enhanced recovery strategies for spinal surgery is required. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

BASIC SCIENCE

Transient Receptor Potential Cation Channels and Calcium Dyshomeostasis in a Mouse Model Relevant to Malignant Hyperthermia

- J. Rafael Lopez, V. Kaura, P. Hopkins, X. Liu, A. Uryach, J. Adams, P. D. Allen.....364

The hypothesis that transient receptor potential cation channels play a critical role in causing intracellular calcium and sodium overload in malignant hyperthermia susceptible muscle was tested in a *RYR1*-p.G2435R knock-in murine model of malignant hyperthermia. Skeletal muscle of mice expressing *RYR1*-p.G2435R had a significantly enhanced, extracellular Ca^{2+} -dependent response to TRPC3/6 channel activators. The TRPC3/6 channel activator response could be prevented by TRPC3/6 channel blockers. Local administration of TRPC channel blockers during an active malignant hyperthermia crisis demonstrated that most of the rise in intracellular resting calcium in skeletal muscle comes from the extracellular space and not sarcoplasmic reticulum stores.

-  **Dexmedetomidine Activation of Dopamine Neurons in the Ventral Tegmental Area Attenuates the Depth of Sedation in Mice**
G. Qiu, Y. Wu, Z. Yang, L. Li, X. Zhu, Y. Wang, W. Sun, H. Dong, Y. Li, J. Hu.....377

Dexmedetomidine, via α_2 receptor-dependent mechanisms, induces activation of dopaminergic neurons in the ventral tegmental area of adult mice. Chemogenetic approaches together with electroencephalographic recordings reveal that the activation of dopaminergic neurons in the ventral tegmental area may contribute to rapid arousability during dexmedetomidine sedation. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

Critical Care Medicine

BASIC SCIENCE

- ◆ **Dexmedetomidine Exerts an Anti-inflammatory Effect via α_2 Adrenoceptors to Prevent Lipopolysaccharide-induced Cognitive Decline in Mice**
R. Li, I. K. Lai, J. Z. Pan, P. Zhang, M. Maze393

Administration of dexmedetomidine to mice treated with lipopolysaccharide decreased neuroinflammation and cognitive impairment in both young and aged mice. The effects of dexmedetomidine on neuroinflammation and cognitive impairment in mice treated with lipopolysaccharide are likely mediated by α_2 adrenoceptor-mediated anti-inflammatory pathways.

Pain Medicine

BASIC SCIENCE

- ◆◆◆ **Dorsal Root Ganglion Stimulation Alleviates Pain-related Behaviors in Rats with Nerve Injury and Osteoarthritis**
G. Yu, I. Segel, Z. Zhang, Q. H. Hogan, B. Pan408

Using a rat model of osteoarthritis, stimulation of both the L3 and L4 dorsal root ganglia reduced nonreflexive knee motion scores and provided conditioned place preference more than sham stimulation. Sensitization from peripheral nerve injury responded to stimulation maximally when provided at two ganglia (L4 and L5) *versus* just one. **SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT**

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J.-C. Preiser, B. Provenzano, W. Mongkolpun, K. Halenarova, M. Cnop430

The right management of oral glucose-lowering drugs aims to identify, assess, and follow patients with diabetes and avoid unnecessary interruptions of the chronic treatment.

REVIEW ARTICLE

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G. D. Nethathe, J. Cohen, J. Lipman, R. Anderson, C. Feldman439

The authors summarize and offer new insights into the mechanisms and clinical implications of the renin-angiotensin-aldosterone system in critical illness, as well as documenting current understanding of the role of mineralocorticoid replacement in this group of patients.

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