

TABLE OF CONTENTS

ANESTHESIOLOGY

Volume 141
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This Month in ANESTHESIOLOGYA1
Science, Medicine, and the Anesthesiologist.....A13
Infographics in AnesthesiologyA16
Editorial

Preoperative Strategies for Patients on Glucagon-like Peptide-1 Receptor Agonists Navigating Current Controversies and Future Directions
G. P. Joshi.....1031

Remimazolam and Ciprofol: More Research Is Needed but Ask the Right Questions and Perhaps Aim Higher
J. R. Sneyd, B. J. Anderson.....1034

Perioperative Medicine

CLINICAL SCIENCE

◇ ◉ ◉ ◉ **Paravertebral versus Pectoralis-II (Interpectoral and Pectoserratus) Nerve Blocks for Postoperative Analgesia after Nonmastectomy Breast Surgery: A Randomized, Controlled, Observer-masked Noninferiority Trial**
R. A. Gabriel, B. P. Curran, M. W. Swisher, J. F. Sztain, P. S. Tsuda, E. T. Said, B. Alexander, J. J. Finneran IV, W. B. Abramson, J. R. Black, A. M. Wallace, S. Blair, M. C. Donohue, B. Abdullah, N. Y. Xu, B. J. Cha, B. M. Ilfeld.....1039

This blinded randomized controlled trial in patients undergoing breast surgery other than mastectomy directly compared ultrasound-guided paravertebral (0.5%, 9 ml/level) and pectoralis-II (0.3%, 30 ml/side) nerve blocks. Paravertebral block was associated with lower pain scores in the recovery room period than pectoralis-II. Paravertebral block was associated with lower combined opioid consumption during intraoperative and recovery room periods than pectoralis-II.

◇ ◉ ◉ ◉ **Factor Eight Inhibitor Bypass Activity Use in Cardiac Surgery: A Propensity-matched Analysis of Safety Outcomes**
J. A. Nicholas, N. Harrison, D. Chakraborty, A. L. Chang, N. Aghaeepour, K. Wirtz, E. Nielson, C. Parsons, E. Jackson, A. K. Panigrahi.....1051

In a propensity-matched analysis of 704 cardiac surgical patients, administration of a low mean factor eight inhibitor bypass activity (FEIBA) dose of 7.3 ± 5.5 U/kg did not increase thromboembolic event risk, intensive care unit length of stay, or mortality. In patients at a higher risk for bleeding and adverse events, higher FEIBA doses were associated with increased renal failure and postoperative transfusion, suggesting the need for additional prospective randomized clinical studies in this population.

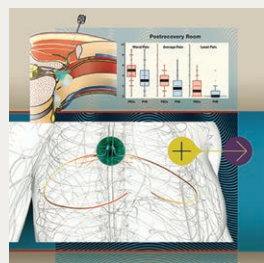
◇ ◉ ◉ ◉ **Effects of Serratus Anterior Plane Block on Early Recovery from Thoracoscopic Lung Resection: A Randomized, Blinded, Placebo-controlled Trial**
J. C. Jackson, K. S. Tan, A. Pedoto, B. J. Park, V. W. Rusch, D. R. Jones, H. Zhang, D. Desiderio, G. W. Fischer, D. Amar.....1065

This study is a single-center prospective randomized clinical trial of 99 patients who underwent minimally invasive thoracic lung surgery. All patients received intraoperative intravenous fentanyl, dexamethasone, dexmedetomidine, acetaminophen, and ketorolac and postoperative intercostal blocks. Patients were randomized to additionally receive a serratus anterior plane block at the end of surgery or to receive a placebo serratus anterior plane block. The primary study outcome was cumulative intravenous morphine equivalents received in the first 24 h after surgery. Intention-to-treat analysis found that 24-h postoperative intravenous morphine equivalents were not significantly increased for the placebo group compared with the intervention group. An additional as-treated analysis found that the intravenous morphine equivalents received by the placebo group were significantly but modestly higher at

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ON THE COVER: Pectoralis-II and paravertebral nerve blocks are both used to treat pain after breast surgery, and most previous studies involving mastectomy show little difference between the two approaches. In this issue of ANESTHESIOLOGY, Gabriel *et al.* hypothesized that pectoralis-II blocks would provide noninferior analgesia to paravertebral blocks in nonmastectomy breast surgery, with dual primary endpoints of pain scores within the recovery room and opioid consumption in both the operating room and recovery room combined. Cover illustration: A. Johnson, Vivo Visuals Studio. Injection anatomy art by G. Nelson, modified from Rathmell JP: Complications in Regional Anesthesia and Pain Medicine, 2nd edition. Lippincott Williams & Wilkins, 2012.

- Gabriel *et al.*: Paravertebral versus Pectoralis-II (Interpectoral and Pectoserratus) Nerve Blocks for Postoperative Analgesia after Nonmastectomy Breast Surgery: A Randomized, Controlled, Observer-masked Noninferiority Trial, p. 1039

24 h after surgery than the intravenous morphine equivalents received by the serratus anterior plane block group. Future studies may be warranted to further explore potential benefit of serratus anterior plane blocks in minimally invasive thoracic lung surgery patients.

◇  **Short-term Outcomes in Infants after General Anesthesia with Low-dose Sevoflurane/Dexmedetomidine/Remifentanyl versus Standard-dose Sevoflurane (the TREX Trial)**

R. Saynalath, N. Disma, F. J. Taverner, B. S. von Ungern-Sternberg, D. Andropoulos, A. S. Ng, B. B. Shields, F. Izzo, P. Lee-Archer, M. E. McCann, L. Montagnini, B. Koppers, E. Lenares, S. Sheppard, J. C. de Graaff, K. J. Lee, X. Wang, P. Szmuk, A. J. Davidson, J. J. Skowno, on behalf of the TREX (Trial Remifentanyl DEXmedetomidine) Consortium1075

This analysis presents and compares salient short-term perioperative outcomes from the Trial Remifentanyl Dexmedetomidine (TREX) trial, including the prevalence of intraoperative hypotension, bradycardia, light anesthesia events, postoperative pain scores, time to recovery, and morbidity and mortality. These early postoperative results suggest that in children less than 2 yr of age receiving greater than 2 h of general anesthesia, the low-dose sevoflurane/dexmedetomidine/remifentanyl anesthesia technique and the standard sevoflurane anesthesia technique are broadly clinically similar, with no clear evidence to support choosing one technique over the other.

◇  **Biodemography of Human Aging (Gompertz–Makeham Law) Applied to Surgical Mortality Modeling: A Retrospective National Cohort Study**

D. Campbell, L. Boyle, M. Webb, M. Mistry, T. G. Short.....1086

Using a comprehensive registry of 5,615,100 adult patients undergoing surgery between 2007 and 2016 across New Zealand, all-cause mortality within 1 month after surgery occurred in 114,782 (2.0%) patients. One-month postoperative risk for patients aged 18 to 30 yr appears constant (slope, -0.0116 ; R^2 , 0.446), while an exponential risk was seen after age 30 yr (slope, 0.0241; R^2 , 0.971). The Gompertz–Makeham law appears to apply to 1-month surgical mortality and should be considered when including age in surgical mortality modeling.

Critical Care Medicine

CLINICAL SCIENCE

Mechanical Power in Decelerating Flow versus Square Flow Ventilation in Pediatric Acute Respiratory Distress Syndrome

A. G. Percy, G. Keim, A. K. Bhalla, N. Yehya1095

Mechanical power was marginally lower in square wave compared to decelerating flow ventilation.

BASIC SCIENCE

◇  **Cardiovascular Effects of Increasing Positive End-expiratory Pressure in a Model of Left Ventricular Cardiogenic Shock in Female Pigs**

O. K. Hørsdal, K. L. Wethelund, N. Gopalasingam, M. D. Lyhne, M. S. Ellegaard, O. K. Møller-Helgestad, H. B. Ravn, H. Wiggers, S. Christensen, K. Berg-Hansen1105

In a female swine model of left ventricular cardiogenic shock, increasing positive end-expiratory pressure caused reduction in the total mechanical power expenditure of the left ventricle as well as afterload and preload. Titration of positive end-expiratory pressure in cardiogenic shock complicating myocardial infarction may be of therapeutic benefit to preserve left ventricular function.

◆  **Activation of $\alpha 7$ Nicotinic Acetylcholine Receptors Inhibits Hepatic Necroptosis and Ameliorates Acute Liver Injury in Mice**

F.-F. Xu, Z.-C. Li, W.-J. Zhang, Q. Li, D.-J. Li, H.-B. Meng, F.-M. Shen, H. Fu1119

Hepatic expression of $\alpha 7$ nicotinic acetylcholine receptors rapidly increased in an experimental mouse model of acute liver injury induced by intraperitoneal injection of lipopolysaccharide/D-galactosamine. Genetic deficiency of $\alpha 7$ nicotinic acetylcholine receptors exacerbated hepatic injury while pharmacologic activation of this receptor had opposite effects. The protective effects of $\alpha 7$ nicotinic acetylcholine receptors operate via alleviation of hepatic mitochondrial damage and necroptosis and may involve the stimulator of interferon gene signaling pathway.


Education

IMAGES IN ANESTHESIOLOGY

◇  **Ex Utero Intrapartum Intubation for Giant Fetal Neck Mass**

M. Zhao, L. Pei, Y. Jiang, J. Gao1139

CLINICAL FOCUS REVIEW

◆  **Perioperative Management of Patients Taking Glucagon-like Peptide-1 Receptor Agonists: Applying Evidence to Clinical Practice**

A. D. Oprea, G. E. Umpierrez, B. Sweitzer, D. L. Hepner1141

This review discusses recent evidence addressing risks in patients taking glucagon-like peptide-1 receptor agonist medications and proposes a framework for perioperative management.

◇  **Navigating Hemolysis and the Renal Implications of Hemoglobin Toxicity in Cardiac Surgery**

D. J. Schaer, C. A. Schaer, R. Humar, F. Vallelian, R. Henderson, K. A. Tanaka, J. H. Levy, P. W. Buehler1162

Cardiopulmonary bypass-induced hemolysis is linked to acute kidney injury in cardiac surgery. Emerging therapies targeting cell-free hemoglobin, like haptoglobin, nitric oxide, and antioxidants, show promise in reducing kidney injury, highlighting the need for further research.

REVIEW ARTICLE

Role for Lumbar Cerebrospinal Fluid Drainage in High-risk Thoracic Endovascular Aortic Repair: A Narrative Review

T. Shelton, B. Gigax, A. H. Aly, K. Choi, E. Tili, K. Orion, B. Modarai, A. Beck, H. P. Grocott, H. Awad.....1175

The current literature on efficacy and safety of cerebrospinal fluid drainage in high-risk thoracic endovascular aortic repair patients is limited. To better guide clinical decision-making, additional large randomized controlled trials investigating cerebrospinal fluid drain benefits and complications are needed.

MIND TO MIND

Puncture Wound

C. M. Kim1191

Blame it on ... Anesthesia?

K. Castro-Frenzel1193

Correspondence

RESEARCH LETTERS

Performance of a Large Language Model on the Anesthesiology Continuing Education Exam

V. Gupta, Y. Gu, S. J. Lustik, W. Park, S. Yin, D. Rubinger, F. M. Chang, K. Panda, S. Besharat, H. Sadhra, L. G. Glance1196

Comparing the Hypotension Prediction Index to Mean Arterial Pressure and Linear Extrapolated Mean Arterial Pressure for the Prediction of Intraoperative Hypotension: A Secondary Analysis

D. Massari, I. N. de Keijzer, J. J. Vos1200

Pronouns in the Electronic Medical Record: A Potential Pitfall

E. Kim, S. Mukerji, R. Price, D. Debryn, V. Gupta, A. Nozari1203

🌐 Methadone Dosing and Postoperative Pain Management in Cardiothoracic Surgery: A Retrospective Cohort Study

A. J. Milam, M. K. Fah, B. T. Houston, M. R. Youssef, S. A. Buckner-Petty, K. Sell-Dottin, R. S. D'Souza, D. O. Warner, B. B. Smith1205

LETTERS TO THE EDITOR

Preprocedure Care of Patients on Glucagon-like Peptide-1 Receptor Agonists: A Multisociety Clinical Practice Guidance

G. P. Joshi, T. LaMasters, T. L. Kindel1208

Intraoperative Vasopressors and Delirium: Comment

A. Kumar, A. Jain1209

Intraoperative Vasopressors and Delirium: Reply

H. Ma, E. Ahrens, L. J. Wachtendorf, G. Chen, J. Rhee, M. S. Schaefer1211

Damage Control Resuscitation in Traumatic Hemorrhage: Comment
S. Hughey, A. Brust, R. Hughey, J. Cole1212

Damage Control Resuscitation in Traumatic Hemorrhage: Comment
M. B. Baker, J. Ortoleva, Y. Wang, A. Nozari, W. E. Baker1213

Consciousness and the Dying Brain: Comment
R. M. Raw1215

Transfusions in Lung Transplantation: Comment
E. R. Strauss, M. Mali, R. Henderson, S. Mondal1216

Transfusions in Lung Transplantation: Reply
B. A. Bottiger, J. Klapper, J. Fessler, B. Shaz, J. Levy1217

Reviews of Educational Material

If I Betray These Words: Moral Injury in Medicine and Why It's So Hard for Clinicians to Put Patients First
K. E. McGoldrick1219

Hektoen International: A Journal of Medical Humanities
A. J. Schwartz1222

Errata

Hemodynamic Support in Sepsis: Erratum1224

Quadratus Lumborum Block: Anatomical Concepts, Mechanisms, and Techniques: Erratum1226

Science, Medicine, and the Anesthesiologist (October 2024): Erratum1227

Anesthesiology Reflections from the Wood Library-Museum

Dr. Paul M. Wood's Namesake Collection Finds a Home
R. C. Roy, M. L. Coleman1050

Anesthesia per Rectum: Gwathmey's Oil-Ether Approach
J. S. Moon1064

Careers & Events A17

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