



ON THE COVER:

We continue our end-of-the-year special focus on an institution which has developed and maintained research excellence in the specialty. This year a majority of the December issue comes from the department of anesthesiology at the University of Michigan (Ann Arbor, Michigan). (The heli-photo of the University of Michigan medical center was provided by Dale Fisher.)

THIS MONTH IN ANESTHESIOLOGY

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Eduardo E. Icaza and George A. Mashour

- ◊ Refers to This Month in Anesthesiology
- ◆ Refers to Editorial Views
- M** This article is from or about the University of Michigan

- 🌐 See Supplemental Digital Content
- CME** CME Article

An Analysis of Methodologies That Can Be Used to Validate if a Perioperative Surgical Home Improves the Patient-centeredness, Evidence-based Practice, Quality, Safety, and Value of Patient Care

1261

Thomas R. Vetter, Nataliya V. Ivankova, Lee A. Goeddel, Gerald McGwin, Jr., and Jean-Francois Pittet for the UAB Perioperative Surgical Home Group

■ PERIOPERATIVE MEDICINE

◆◆ **M Increased Risk of Intraoperative Awareness in Patients with a History of Awareness** 1275

Amrita Aranake, Stephen Gradwohl, Arbi Ben-Abdallah, Nan Lin, Amy Shanks, Daniel L. Helsten, David B. Glick, Eric Jacobsohn, Alex J. Villafranca, Alex S. Evers, Michael S. Avidan, and George A. Mashour

In a matched cohort analysis of patients drawn from three trials including over 25,000 patients, those with a history of intraoperative awareness had a five-fold increased incidence of awareness compared with propensity-matched controls who did not have a history of awareness. Anesthetic management did not differ between the cohorts; in view of the likely increased risk of awareness, clinicians should consider modifying anesthetic management in patients with a history of awareness.

◆ **M Failure of the Laryngeal Mask Airway Unique™ and Classic™ in the Pediatric Surgical Patient: A Study of Clinical Predictors and Outcomes** 1284

Michael R. Mathis, Bishr Haydar, Emma L. Taylor, Michelle Morris, Shobha V. Malviya, Robert E. Christensen, Satya-Krishna Ramachandran, and Sachin Kheterpal

This study evidenced that laryngeal mask airway failures occur in 0.86% of 11,910 pediatric anesthesia cases with its planned use, and are independently associated with ear/nose/throat procedures, admission status, prolonged surgical duration, airway abnormalities, and patient transport.

◆ **Six Percent Hydroxyethyl Starch 130/0.4 (Voluven®) versus 5% Human Serum Albumin for Volume Replacement Therapy during Elective Open-heart Surgery in Pediatric Patients** 1296

Philippe Van der Linden, Andrée De Villé, Anna Hofer, Martina Heschl, and Hans Gombotz

This randomized clinical trial demonstrated equivalent efficacy of human albumin *versus* hydroxyethyl starch for volume replacement in 61 children undergoing cardiac surgery. Although the trial was not powered to assess safety, outcomes measures were not different between the groups.

M Patient Selection for Day Case-eligible Surgery: Identifying Those at High Risk for Major Complications 1310

Michael R. Mathis, Norah N. Naughton, Amy M. Shanks, Robert E. Freundlich, Christopher J. Pannucci, YiJia Chu, Jason Haus, Michelle Morris, and Sachin Kheterpal

In a review of nearly 250,000 cases in the National Surgery Quality Improvement Program, early perioperative morbidity and mortality occurred in approximately 1:1,000 patients. Predictors for morbidity and mortality were overweight or obesity, chronic obstructive pulmonary disease, history of transient ischemic attack/stroke, hypertension, prior cardiac surgical intervention, and prolonged operative time.

◆ **M Predictors of Survival from Perioperative Cardiopulmonary Arrests: A Retrospective Analysis of 2,524 Events from the Get With The Guidelines-Resuscitation Registry** 1322

Satya Krishna Ramachandran, Jill Mhyre, Sachin Kheterpal, Robert E. Christensen, Kristen Tallman, Michelle Morris, and Paul S. Chan, for the American Heart Association's Get With The Guidelines-Resuscitation Investigators

One third of patients with perioperative cardiac arrests survive to hospital discharge. Two thirds of survivors have good neurological outcome. Shockable rhythms and asystolic arrests were associated with significant location-specific survival variance.

M Perioperative Metoprolol and Risk of Stroke after Noncardiac Surgery 1340

George A. Mashour, Milad Sharifpour, Robert E. Freundlich, Kevin K. Tremper, Amy Shanks, Brahmajee K. Nallamothu, Phillip E. Vlisides, Adam Weightman, Lisa Matlen, Janna Merte, and Sachin Kheterpal

In this retrospective study, routine use of preoperative and intraoperative metoprolol—but not other β blockers—was associated with increased risk of stroke after noncardiac surgery. These data suggest that results of the POISE trial may have reflected a drug-specific effect of metoprolol in perioperative stroke.

- ✉ Reconfiguration of Network Hub Structure after Propofol-induced Unconsciousness** 1347
Heonsoo Lee, George A. Mashour, Gyu-Jeong Noh, Seunghwan Kim, and UnCheol Lee

Propofol reconfigures the brain's network hub structure. Reconfiguration of hub structure may explain the observed loss of frontal–parietal feedback connectivity.

- CME ✉ Incidence, Predictors, and Outcome of Difficult Mask Ventilation Combined with Difficult Laryngoscopy: A Report from the Multicenter Perioperative Outcomes Group** 1360

Sachin Kheterpal, David Healy, Michael F. Aziz, Amy M. Shanks, Robert E. Freundlich, Fiona Linton, Elizabeth D. Martin, Jonathan Linton, Jerry L. Epps, Ana Fernandez-Bustamante, Leslie C. Jameson, Tyler Tremper, and Kevin K. Tremper, on behalf of the Multicenter Perioperative Outcomes Group (MPOG) Perioperative Clinical Research Committee

This study determined incidence of difficult mask ventilation combined with difficult laryngoscopy to be 0.4% of 176,679 adult cases, and succeeded in identifying 12 independent predictors for the critical situation.

■ CRITICAL CARE MEDICINE

- ◆ Propofol Limits Microglial Activation after Experimental Brain Trauma through Inhibition of Nicotinamide Adenine Dinucleotide Phosphate Oxidase** 1370

Tao Luo, Junfang Wu, Shruti V. Kadi, Boris Sabirzhanov, Kelsey Guanciale, Marie Hanscom, Julianne Faden, Katherine Cardiff, Charles Jeremy Bengson, and Alan I. Faden

Propofol reduces functional deficit after traumatic brain injury, in an animal model. These neuroprotective effects are mediated in part by inhibition of microglial nicotinamide adenine dinucleotide phosphate oxidase.

Critical Role of Interleukin-11 in Isoflurane-mediated Protection against Ischemic Acute Kidney Injury in Mice

Ahrom Ham, Mihwa Kim, Joo Yun Kim, Kevin M. Brown, James Yeh, Vivette D. D'Agati, and H. Thomas Lee

Isoflurane increased interleukin-11 synthesis in human and mouse proximal tubular cells *via* TGF- β 1 signaling to protect against ischemic acute kidney injury.

- 🌐 Positive End-expiratory Pressure Increments during Anesthesia in Normal Lung Result in Hysteresis and Greater Numbers of Smaller Aerated Airspaces** 1402

Maurizio Cereda, Yi Xin, Kiarash Emami, Jessie Huang, Jennia Rajaei, Harrilla Profka, Biao Han, Puttisarn Mongkolwisetwara, Stephen Kadlecek, Nicholas N. Kuzma, Stephen Pickup, Brian P. Kavanagh, Clifford S. Deutschman, and Rahim R. Rizi

In healthy rats, larger lung volumes due to hysteresis were associated with smaller individual airspace dimensions, suggesting opening of previously nonaerated peripheral airspaces, rather than expansion of already opened airspaces.

SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT

■ PAIN MEDICINE

- ◆ 🌐 Pain in 1,000 Women Treated for Breast Cancer: A Prospective Study of Pain Sensitivity and Postoperative Pain** 1410

Mari A. Kaunisto, Ritva Jokela, Minna Tallgren, Oleg Kambur, Emmi Tikkanen, Tiina Tasmuth, Reetta Sipilä, Aarno Palotie, Ann-Mari Estlander, Marjut Leidenius, Samuli Ripatti, and Eija A. Kalso

In a study of 1,000 women undergoing breast surgery for cancer, a small portion of the variance in preoperative response to noxious heat and cold testing could be explained by anxiety, the presence of chronic pain, and the number of previous operations. There was a weak correlation between response to experimental pain testing and acute postoperative pain, with largely similar predictive factors across both. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

- ◆◆🌐 **Effect of Catechol-o-methyltransferase-gene (*COMT*) Variants on Experimental and Acute Postoperative Pain in 1,000 Women undergoing Surgery for Breast Cancer** 1422
Oleg Kambur, Mari A. Kaunisto, Emmi Tikkanen, Suzanne M. Leal, Samuli Ripatti, and Eija A. Kalso

In a more complete assessment of variants in the *COMT* gene in 1,000 women undergoing surgery for breast cancer, there were weak associations with sensitivity to heat or cold pain. The lack of association of *COMT* variants with acute postoperative opioid requirement raises questions regarding the clinical relevance of this gene in acute postoperative pain. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

- 🌐 **Survey Criteria for Fibromyalgia Independently Predict Increased Postoperative Opioid Consumption after Lower-extremity Joint Arthroplasty: A Prospective, Observational Cohort Study** 1434
Chad M. Brummett, Allison M. Janda, Christa M. Schueller, Alex Tsodikov, Michelle Morris, David A. Williams, and Daniel J. Clauw

Even though less than 9% of participants met “criteria” for fibromyalgia, increasing degrees of fibromyalgia-like symptoms were independently predictive of increased postoperative opioid requirements. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

- 🌐 **Lidocaine Patch (5%) in Treatment of Persistent Inguinal Postherniorrhaphy Pain: A Randomized, Double-blind, Placebo-controlled, Crossover Trial** 1444
Joakim M. Bischoff, Marian Petersen, Nurcan Üçeyler, Claudia Sommer, Henrik Kehlet, and Mads U. Werner

Lidocaine patches (5%) caused pressure pain threshold increases when compared with placebo patch treatment. However, lidocaine patch treatment did not lead to decreases in summed pain intensity differences. *SUPPLEMENTAL DIGITAL CONTENT IS AVAILABLE IN THE TEXT*

- ◆ **Pregabalin Rectifies Aberrant Brain Chemistry, Connectivity, and Functional Response in Chronic Pain Patients** 1453
Richard E. Harris, Vitaly Napadow, John P. Huggins, Lynne Pauer, Jieun Kim, Johnson Hampson, Pia C. Sundgren, Bradley Foerster, Myria Petrou, Tobias Schmidt-Wilcke, and Daniel J. Clauw

Using three complementary imaging techniques (proton magnetic resonance spectroscopy, functional magnetic resonance imaging, and functional connectivity) in chronic pain patients with fibromyalgia, it was shown that pregabalin treatment reduced brain insula glutamate levels and was associated with decreased connectivity of this structure to the default mode network.

■ CLASSIC PAPERS REVISITED

- Therapeutic Benefit of the Anesthesiologist–Patient Relationship** 1465
Lawrence D. Egbert and Stephen H. Jackson

This article is a revisiting of original material published as: Egbert LD, Battit GE, Turndorf H, Beecher HK: The value of the preoperative visit by an anesthetist: A study of doctor–patient rapport. *JAMA* 1963; 185:553–5.

■ EDUCATION

IMAGES IN ANESTHESIOLOGY

- Icteric Vocal Cords Recorded during Video Laryngoscopy** 1469
Richard M. Cooper

- Anomalous Origin of the Left Pulmonary Artery from the Right Pulmonary Artery (Pulmonary Artery Sling)** 1470
Ahmad Zabad and Mohanad Shukry

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Perioperative Organ Injury 1474

Karsten Bartels, Jörn Karhausen, Eric T. Clambey, Almut Grenz, and Holger K. Eltzschig

Prevention and treatment of acute organ injury in surgical patients represents a critical challenge for the field of perioperative medicine. Here, the authors discuss manifestations of perioperative organ injury and provide examples for novel treatment approaches.

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