



ON THE COVER:

Breastfeeding is an important public health concern. High cumulative doses of epidural fentanyl used for labor analgesia have been associated with early termination of breastfeeding. In this issue of *ANESTHESIOLOGY*, Lee *et al.* report that labor epidural solutions containing fentanyl concentrations as high as 2 µg/ml do not appear to influence breastfeeding rates at 6 weeks postpartum. In an accompanying Editorial View, Chestnut puts the new research findings in perspective and encourages all anesthesiologists who provide care for obstetric patients to be champions for a culture that supports breastfeeding.

- Lee *et al.*: Epidural Labor Analgesia—Fentanyl Dose and Breastfeeding Success: A Randomized Clinical Trial, p. 614
- Chestnut: Labor Epidural Analgesia and Breastfeeding, p. 593

◆ THIS MONTH IN ANESTHESIOLOGY

1A

■ SCIENCE, MEDICINE, AND THE ANESTHESIOLOGIST

15A

■ INFOGRAPHICS IN ANESTHESIOLOGY

19A

◆ EDITORIAL VIEWS

Labor Epidural Analgesia and Breastfeeding

D. H. Chestnut

593

Not Too Little, Not Too Much: Finding the Goldilocks Zone for Spinal Anesthesia to Facilitate External Cephalic Version

B. Carvalho and B. T. Bateman

596

Extubation, Black Boxes, and Ontology

M. J. Tobin and F. Laghi

599

■ SPECIAL ANNOUNCEMENTS

Journal-related Activities and Other Special Activities at the 2017 American Society of Anesthesiologists Meeting

M. J. Avram, E. D. Kharasch, S. Kheterpal, J. P. Rathmell, and D. I. Sessler

601

Paul Myles, M.B.B.S., M.P.H., D.Sc., Recipient of the 2017 Excellence in Research Award

P. Nagele, D. I. Sessler, and S. Beattie

609

Chad Brummett, M.D., Recipient of the 2017 James C. Cottrell, M.D., Presidential Scholar Award

K. K. Tremper

611

◆ Refers to This Month in Anesthesiology

◆ Refers to Editorial Views



This article has an Audio Podcast



See Supplemental Digital Content



CME Article



This article has a Video Abstract

■ PERIOPERATIVE MEDICINE

CLINICAL SCIENCE

- ◆ ◆ **Epidural Labor Analgesia—Fentanyl Dose and Breastfeeding Success: A Randomized Clinical Trial** 614

A. I. Lee, R. J. McCarthy, P. Toledo, M. J. Jones, N. White, and C. A. Wong

A randomized parallel group study of three epidural solutions of bupivacaine with or without fentanyl showed that breastfeeding success at 6 weeks was not influenced by the epidural fentanyl concentration or the cumulative epidural fentanyl dose administered for labor analgesia. Maternal and umbilical cord venous fentanyl and bupivacaine concentrations did not differ between women who discontinued breastfeeding (3 to 6%) and those who were still breastfeeding at 6 weeks postpartum.

- ◆ ◆ **Effect of Intrathecal Bupivacaine Dose on the Success of External Cephalic Version for Breech Presentation: A Prospective, Randomized, Blinded Clinical Trial** 625



L. A. Chalifoux, J. R. Bauchat, N. Higgins, P. Toledo, F. M. Peralta, J. Farrer, S. E. Gerber, R. J. McCarthy, and J. T. Sullivan

The success of cephalic version was approximately 50% in each group. Spinal anesthetic dose does not influence the success of cephalic version.

- ◆ **Perioperative Gabapentin Does Not Reduce Postoperative Delirium in Older Surgical Patients: A Randomized Clinical Trial** 633



J. M. Leung, L. P. Sands, N. Chen, C. Ames, S. Berven, K. Bozic, S. Burch, D. Chou, K. Covinsky, V. Deviren, S. Kinjo, J. H. Kramer, M. Ries, B. Tay, T. Vail, P. Weinstein, and the Perioperative Medicine Research Group

Preoperative and postoperative administration of gabapentin reduced postoperative opioid use. However, gabapentin did not reduce the incidence of delirium after major surgery.

- 🌐 **Investigation of Slow-wave Activity Saturation during Surgical Anesthesia Reveals a Signature of Neural Inertia in Humans** 645

C. E. Warnaby, J. W. Sleight, D. Hight, S. Jbabdi, and I. Tracey

Slow-wave activity saturation was observed on induction under both propofol and sevoflurane anesthesia. Simultaneous administration of opiates, but not muscle relaxants, reduced the concentration of anesthetic required for slow-wave activity saturation. Anesthetic dose required to induce slow-wave activity saturation was different during induction and emergence, indicating a certain neural inertia on transition to return of consciousness. Interestingly, abrupt changes in slow-wave activity were more often associated with confusion and delirium after emergence.

- ◆ 🌐 **Preventing Retained Central Venous Catheter Guidewires: A Randomized Controlled Simulation Study Using a Human Factors Approach** 658

M. Z. A. Mariyaselvam, K. R. Catchpole, D. K. Menon, A. K. Gupta, and P. J. Young

The locked pack is effective to prevent retained guidewires and acceptable to clinicians for improving patient safety.

■ CRITICAL CARE MEDICINE

CLINICAL SCIENCE

- ◆ ◆ 🌐 **Combined Thoracic Ultrasound Assessment during a Successful Weaning Trial Predicts Postextubation Distress** 666

S. Silva, D. Ait Aissa, P. Cocquet, L. Hoarau, J. Ruiz, F. Ferre, D. Rousset, M. Mora, A. Mari, O. Fourcade, B. Riu, S. Jaber, and B. Bataille

Ultrasound examination was repeated before and after a pressure support trial (136 patients) and integrated models (lung, heart, and diaphragm) accurately predicted postextubation distress (area under the curve greater than 0.90); interstitial edema and elevated left ventricular diastolic pressure were most predictive. Integrated sonography might be valuable in assessing extubation readiness in the intensive care unit.

CONTENTS

■ PAIN MEDICINE

CLINICAL SCIENCE

◇ Pharmacokinetics and Bioavailability of Inhaled Esketamine in Healthy Volunteers 675

K. Jonkman, A. Duma, E. Olofsen, T. Henthorn, M. van Velzen, R. Mooren, L. Siebers, J. van den Beukel, L. Aarts, M. Niesters, and A. Dahan

A simple compartmental pharmacokinetic model characterized the disposition of both inhaled and intravenous esketamine in volunteers. There were two distinct pulmonary absorption pathways, a rapid one and one from which ketamine was released slowly. Inhaled ketamine bioavailability was reduced due to both dose-independent and dose-dependent impairment of pulmonary uptake.

CME ◇ Recovery after Nulliparous Birth: A Detailed Analysis of Pain Analgesia and Recovery of Function 684

R. Komatsu, B. Carvalho, and P. D. Flood

After vaginal delivery, median time was 0.5 days for opioid cessation, 11 days for stopping all analgesics, and 15 days for pain resolution. After cesarean delivery, median time was 8 days for opioid cessation, 17 days for stopping all analgesics, and 21 days for pain resolution. There was substantial interpatient variability in these times.

BASIC SCIENCE

◇ Hydrogen Peroxide Induces Muscle Nociception *via* Transient Receptor Potential Ankyrin 1 Receptors 695



D. Sugiyama, S. Kang, N. Arpey, P. Arunakul, Y. M. Usachev, and T. J. Brennan

The injection of H₂O₂ solutions into muscle but not more superficial skin tissues caused nociceptive behaviors in rats that were blocked by transient receptor potential ankyrin 1 antagonists. Experiments using capsaicin nerve block suggested that unmyelinated nociceptive neurons transmit nociceptive signals after H₂O₂ administration.

■ EDUCATION

IMAGES IN ANESTHESIOLOGY

🌐 Video Laryngoscopy for Intubation after Smoke Inhalation 709

B. M. Conti, L. Y. Fouché-Weber, J. E. Richards, and T. Grissom

Tension Pneumocephalus 710

A. R. Clement, D. Palaniappan, and R. K. Panigrahi

Point-of-care Ultrasound Detection of Intraoperative Venous Air Embolism 711

W. Alrayashi, T. Miller, and D. Vo

Costoclavicular Space: A Reliable Gate for Continuous Regional Anesthesia Catheter Insertion 712

C. García-Vitoria, J. Vizuite, A. M. L. Navarro, and M. Bosch

MIND TO MIND

Let's Talk: A Breakdown in Communication? 713

B. Fallon and A. Stewart

Anesthesiology and the Non-English-speaking Patient 716

V. K. Bansal

■ CORRESPONDENCE

Nerve Blocks and Length of Stay? 718
H. Kehlet and C. C. Jørgensen

Effect of Peripheral Nerve Block on Length of Stay after Total Knee Arthroplasty 718
J.-W. Hwang, and Y.-T. Jeon

In Reply
D. I. McIsaac, C. J. L. McCartney, and C. van Walraven

Combining Angiotensin Converting Enzyme Inhibitors and Angiotensin Receptor Blocker for Clinical Decision-making Lacks Vision 720
M. W. Manning, C. R. Garner, and E. G. Teeter

In Reply
P. S. Roshanov and P. J. Devereaux

The Isolated Forearm Paradox: Why Never a Response to Command in the Completely Unparalyzed? 722
J. J. Pandit

Current Status of Neuromuscular Reversal and Monitoring: Posttetanic Neuromonitoring and Other Considerations 723
H. P. Grocott

In Reply
S. J. Brull and A. F. Kopman

Intraoperative Mean Arterial Pressure Targets: Can Databases Give Us a Universally Valid “Magic Number” or Does Physiology Still Apply for the Individual Patient? 725
B. Saugel, D. A. Reuter, and P. C. Reese

In Reply
V. Salmasi and D. I. Sessler

Diagnostic Accuracy Studies: The Methodologic Approach Matters! 728
M. Jacquet-Lagrèze, G. Izaute, and J.-L. Fellahi

In Reply
M. Biais, E. Futier, B. Pereira, and K. Nouette-Gaulain

Clarification: Current Status of Neuromuscular Reversal and Monitoring, Challenges and Opportunities 730
E. C. Hyman and S. J. Brull

INSTRUCTIONS FOR AUTHORS

The most recently updated version of the Instructions for Authors is available at www.anesthesiology.org. Please refer to the Instructions for the preparation of any material for submission to ANESTHESIOLOGY.

Manuscripts submitted for consideration for publication must be submitted in electronic format. The preferred method is via the Journal's Web site (<http://www.anesthesiology.org>). Detailed directions for submissions and the most recent version of the Instructions for Authors can be found on the Web site (<http://www.anesthesiology.org>). Books and educational materials should be sent to Alan Jay Schwartz, M.D., M.S.Ed., Director of Education, Department of Anesthesiology and Critical Care Medicine, The Children's Hospital of Philadelphia, 34th Street and Civic Center Blvd., Room 9327, Philadelphia, Pennsylvania 19104-4399. Requests for permission to duplicate materials published in ANESTHESIOLOGY should be submitted in electronic format, to the Permissions Department (journalpermissions@lww.com). Advertising and related correspondence should be addressed to Advertising Manager, ANESTHESIOLOGY, Wolters Kluwer Health, Inc., Two Commerce Square, 2001 Market Street, Philadelphia, Pennsylvania 19103 (Web site: <http://www.wkadcenter.com/>). Publication of an advertisement in ANESTHESIOLOGY does not constitute endorsement by the Society or Wolters Kluwer Health, Inc. of the product or service described therein or of any representations made by the advertiser with respect to the product or service.

ANESTHESIOLOGY (ISSN 0003-3022) is published monthly by Wolters Kluwer Health, Inc., 14700 Citicorp Drive, Bldg 3, Hagerstown, MD 21742. Business office: Two Commerce Square, 2001 Market Street, Philadelphia, PA 19103. Periodicals postage paid at Hagerstown, MD, and at additional mailing offices. Copyright © 2017, the American Society of Anesthesiologists, Inc.

Annual Subscription Rates: *United States*—\$981 Individual, \$1876 Institution, \$354 In-training. *Rest of World*—\$930 Individual, \$2084 Institution, \$354 In-training. Single copy rate \$189. Subscriptions outside of North America must add \$54 for airfreight delivery. Add state sales tax, where applicable. The GST tax of 7% must be added to all orders shipped to Canada (Wolters Kluwer Health, Inc.'s GST Identification #895524239, Publications Mail Agreement #1119672). Indicate in-training status and name of institution. Institution rates apply to libraries, hospitals, corporations, and partnerships of three or more individuals. Subscription prices outside the United States must be prepaid. Prices subject to change without notice. Subscriptions will begin with currently available issue unless otherwise requested. Visit us online at www.lww.com.

Individual and in-training subscription rates include print and access to the online version. Online-only subscriptions for individuals (\$301) and persons in training (\$301) are available to nonmembers and may be ordered by downloading a copy of the Online Subscription FAXback Form from the Web site, completing the information requested, and faxing the completed form to 301-223-2400. Institutional rates are for print only; online subscriptions are available via Ovid. Institutions can choose to purchase a print and online subscription together for a discounted rate. Institutions that wish to purchase a print subscription, please contact Wolters Kluwer Health, Inc., 14700 Citicorp Drive, Bldg 3, Hagerstown, MD 21742; phone: 800-638-3030; fax: 301-223-2400. Institutions that wish to purchase an online

subscription or online with print, please contact the Ovid Regional Sales Office near you or visit www.ovid.com/site/index.jsp and select Contact and Locations.

Address for non-member subscription information, orders, or change of address (except Japan): Wolters Kluwer Health, Inc., 14700 Citicorp Drive, Bldg 3, Hagerstown, MD 21742; phone: 800-638-3030; fax: 301-223-2400. In Japan, contact Wolters Kluwer Health Japan Co., Ltd., Forecast Mita Building 5th floor, 1-3-31 Mita Minato-ku, Tokyo, Japan 108-0073; phone: +81 3 5427 1969; email: journal@wkjapan.co.jp.

Address for member subscription information, orders, or change of address: Members of the American Society of Anesthesiologists receive the print and online journal with their membership. To become a member or provide a change of address, please contact the American Society of Anesthesiologists, 1061 American Lane, Schaumburg, Illinois 60173-4973; phone: 847-825-5586; fax: 847-825-1692; email: membership@ASAhq.org. For all other membership inquiries, contact Wolters Kluwer Health, Inc., Customer Service Department, P.O. Box 1610, Hagerstown, MD 21740; phone: 800-638-3030; fax: 301-223-2400.

Postmaster: Send address changes to ANESTHESIOLOGY, P.O. BOX 1610, Hagerstown, MD 21740.

Advertising: Please contact Hilary Druker, Advertising Field Sales Representative, Health Learning, Research & Practice, Medical Journals, Wolters Kluwer Health, Inc.; phone: 609-304-9187; e-mail: Hilary.Druker@wolterskluwer.com. For classified advertising: Joe Anzuena, Recruitment Advertising Representative, Wolters Kluwer Health, Inc., Two Commerce Square, 2001 Market Street, Philadelphia, PA 19103; phone: 215-521-8532; fax: 215-701-2410; e-mail: Joe.Anzuena@wolterskluwer.com.