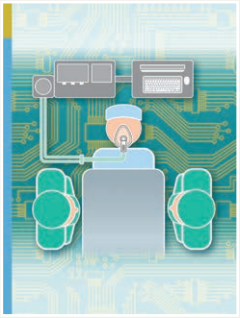
TABLE OF CONTENTS

ANESTHESIOLOGY

Volume 132
Issue 2
February 2020

◇ *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
Part of the Letheon writing competition
This article has a Visual Abstract
Readers' Toolbox



ON THE COVER: Automated management of anesthetic depth is now entirely feasible. In this issue of ANESTHESIOLOGY, Joosten *et al.* demonstrated that closed-loop, automated management of anesthetic, analgesic, fluid, and ventilation parameters was superior to manual control and might influence postoperative outcomes. In an accompanying Editorial, Hemmerling tell us that robotic anesthesia will soon be available and offer some ideas about how the anesthesiologist-of-the-future might interface with automated systems. Cover Illustration: S. M. Jarret, M.F.A., C.M.I.

- Joosten *et al.*: Anesthetic Management Using Multiple Closed-loop Systems and Delayed Neurocognitive Recovery: A Randomized Controlled Trial, p. 253
- Hemmerling: Robots Will Perform Anesthesia in the Near Future, p. 219

For each blood pressure component, the authors report significant and clinically meaningful associations between the lowest pressure sustained for 5 min and myocardial and kidney injury. Absolute population risk thresholds were similar for myocardial and kidney injury, being roughly 90 mmHg for systolic, 65 mmHg for mean, 50 mmHg for diastolic, and 35 mmHg for pulse pressures. The odds for myocardial and kidney injury progressively increased with duration and severity of hypotension below each threshold, even after adjusting for potential baseline confounding factors.

Critical Care Medicine

BASIC SCIENCE

In a rat model of mild lung injury caused by intratracheal endotoxin administration, animals received both pressure-support and pressure-controlled ventilation, and effects on driving pressures were measured, along with lung inflammation and diaphragm inflammation. Pressure-support *versus* pressure-controlled ventilation was associated with higher dynamic (but not static) transpulmonary driving pressure, while markers of lung and diaphragm inflammation did not differ between ventilation modes.

This study assesses the effects of ivabradine, atenolol, and placebo in the setting of murine peritonitis. Mice that received atenolol *versus* ivabradine both experienced a similar and significant decline in heart rate. The mice in the atenolol group also experienced a significant decrease in cardiac output, systolic blood pressure, and left ventricular systolic function that was not experienced by the mice who received ivabradine. Mice who received atenolol *versus* ivabradine *versus* placebo did not have significantly different survival 60 h after induction of sepsis. Future studies are needed to determine the value of ivabradine *versus* atenolol for heart rate control in human sepsis.

Pain Medicine

CLINICAL SCIENCE

Using data from two previously completed trials, it was observed that a single intraoperative dose of methadone was associated with fewer episodes of pain during the first month after cardiac surgery and the first 3 months after spinal surgery. Fewer spine surgery patients who received methadone intraoperatively were receiving opioids 3 months after surgery, suggesting a possible reduction in chronic opioid use.

BASIC SCIENCE

Using a rat model of nerve injury, both male and female animals displayed reduced mechanical and nociceptive sensitization when given dimethyl fumarate. Dimethyl fumarate administration increased superoxide dismutase activity while decreasing cytokine expression and improving mitochondrial bioenergetics.

Using a murine model of bone cancer pain, it was observed that tumor growth was associated with the spinal production of inflammatory mediators and increased expression of endoplasmic reticulum stress markers. The pharmacologic inhibition of endoplasmic reticulum stress reduced pain-related behaviors and the production of inflammatory mediators in spinal tissue.

Education

IMAGES IN ANESTHESIOLOGY

REVIEW ARTICLE

This scoping review of artificial intelligence in anesthesiology summarizes six areas of research: (1) depth of anesthesia monitoring, (2) control of anesthesia, (3) event/risk prediction, (4) ultrasound guidance, (5) pain management, and (6) operating room logistics.

MIND TO MIND

Correspondence

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 via Editorial Manager (https://www.editorialmanager.com/aln). Detailed directions for submission and the most recent version of the Instructions for Authors can be found on the Journal's Web site (http://www.anesthesiology.org). Books and educational materials for review 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. Article-specific permission requests are managed with Copyright Clearance Center's Rightslink service. Information can be accessed directly from articles on the journal Web site. More information is available at http://anesthesiology.pubs.asahq.org/public/rightsandpermissions.aspx. For questions about the Rightslink service, e-mail customercare@copyright.com or call 877-622-5543 (U.S. only) or 978-777-9929. 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.

Annual Subscription Rates: *United States*—$1026 Individual, $2451 Institution, $413 In-training. *Rest of World*—$1082 Individual, $2721 Institution, $413 In-training. Single copy rate $245. Subscriptions outside of North America must add $57 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 ($339) and persons in training ($339) 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.

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; e-mail: 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, National Account Manager, Health Learning, Research & Practice, Medical Journals, Wolters Kluwer Health, Inc.; phone: 609-304-9187; e-mail: Hilary.Druker@wolterskluwer.com. For classified advertising: Dave Wiegand, Recruitment Advertising Representative, Wolters Kluwer Health, Inc.; phone: 847-361-6128; e-mail: Dave.Wiegand@wolterskluwer.com.