Science, Medicine, and the Anesthesiologist

Two Pages to Keep You Abreast of Key Papers from Outside the Specialty and Relevant to Your Practice

Jean Mantz, M.D., Ph.D., James P. Rathmell, M.D., James C. Eisenach, M.D.

MAJOR clinical trials and breakthroughs in fundamental knowledge of relevance to anesthesiologists are often published in general medical or scientific journals, like *New England Journal of Medicine* or *Nature*. Yet, few of us have time to browse the medical literature within our own specialty, to say nothing of the dozen or more major medical and science journals which only occasionally contain information relevant to us. American Society of Anesthesiologists member surveys indicate a strong interest in receiving brief news reports of articles published in journals outside of the specialty, and many are unaware that there is just such a two-page section following the Table of Contents in ANESTHESIOLOGY, which we have aptly named *Science, Medicine, and the Anesthesiologist*. The new feature is easily located from the home page of the journal Web site (fig. 1); clicking on the link to this feature will take you to an easy-to-read Web and mobile-platform-friendly version, and an additional link to a PDF version of this feature is always available for free download (fig. 2). This editorial is part of a

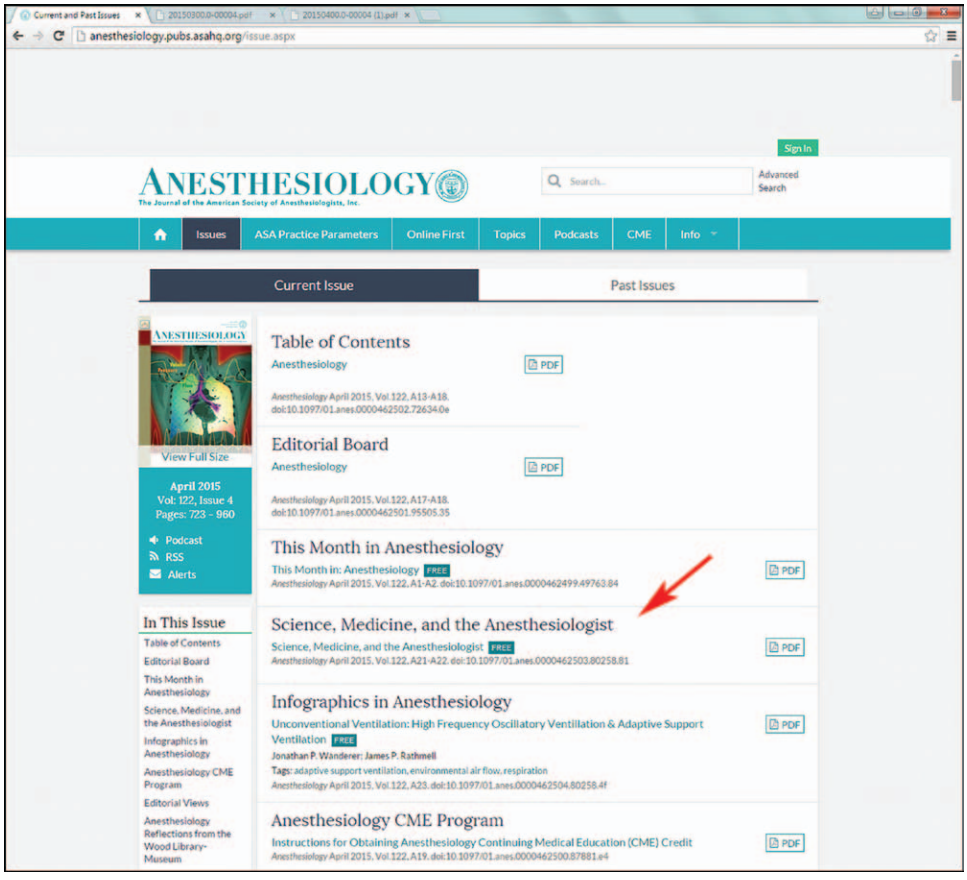

Fig. 1. A direct link to *Science, Medicine, and the Anesthesiologist* that is easy-to-read on all electronic platforms appears on the home page of the ANESTHESIOLOGY Web site.

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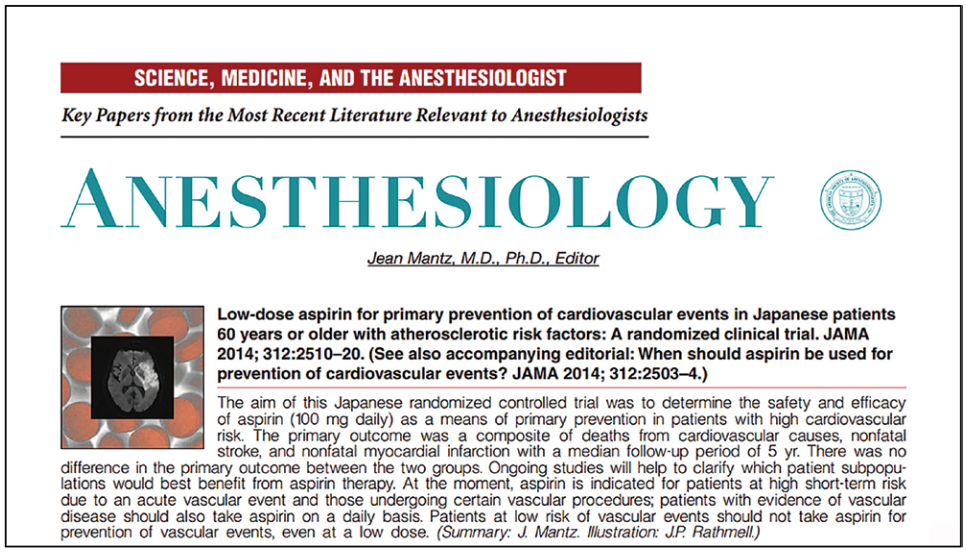

SCIENCE, MEDICINE, AND THE ANESTHESIOLOGIST

Key Papers from the Most Recent Literature Relevant to Anesthesiologists

ANESTHESIOLOGY

Jean Mantz, M.D., Ph.D., Editor

Low-dose aspirin for primary prevention of cardiovascular events in Japanese patients 60 years or older with atherosclerotic risk factors: A randomized clinical trial. JAMA 2014; 312:2510–20. (See also accompanying editorial: When should aspirin be used for prevention of cardiovascular events? JAMA 2014; 312:2503–4.)

The aim of this Japanese randomized controlled trial was to determine the safety and efficacy of aspirin (100 mg daily) as a means of primary prevention in patients with high cardiovascular risk. The primary outcome was a composite of deaths from cardiovascular causes, nonfatal stroke, and nonfatal myocardial infarction with a median follow-up period of 5 yr. There was no difference in the primary outcome between the two groups. Ongoing studies will help to clarify which patient subpopulations would best benefit from aspirin therapy. At the moment, aspirin is indicated for patients at high short-term risk due to an acute vascular event and those undergoing certain vascular procedures; patients with evidence of vascular disease should also take aspirin on a daily basis. Patients at low risk of vascular events should not take aspirin for prevention of vascular events, even at a low dose. *(Summary: J. Mantz. Illustration: J.P. Rathmell.)*

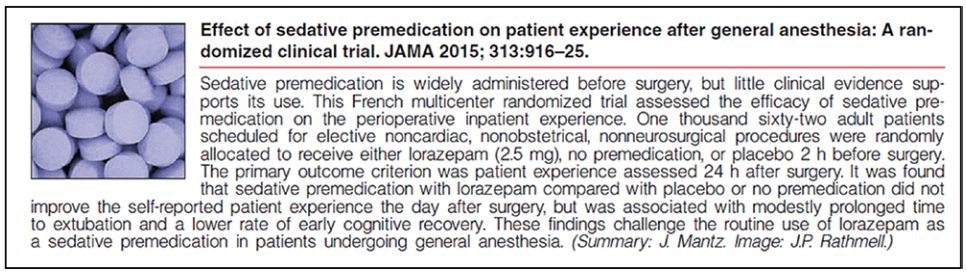
Fig. 2. A free PDF version of *Science, Medicine, and the Anesthesiologist* with related images and brief, easy-to-read textual summaries of leading articles from across medicine is available on the ANESTHESIOLOGY Web site.

series meant to alert our readers to sections of the journal and its Web site, such as this one, of relevance to your practice.

Science, Medicine, and the Anesthesiologist evolved from Literature Reviews, begun by Editor Dr. Timothy Brennan several years ago. The current version provides each month brief (less than 100 words) reviews of eight high-profile articles chosen from a broad array of general medical, surgical, and scientific journals. Articles are chosen and summarized by a small group of Editors and Associate Editors with a focus on articles with direct clinical relevance to anesthesiologists practicing in the intensive care unit, the operating room, the pain clinic, or other perioperative realms. Typically, we summarize four articles in the area of perioperative medicine, two in critical care, one in pain, and one in education. These may include the occasional basic science articles of particular importance to guiding or understanding clinical practice decisions. The goal is to make it easy for the reader to skim these two pages and easily identify the articles in their areas of interest. Each summary provides the gist of the article's findings and its importance and can be read in a few seconds. The full reference is provided should the reader want more. Images are placed adjacent to the summaries to help visually alert the reader to the topic while they are quickly skimming.

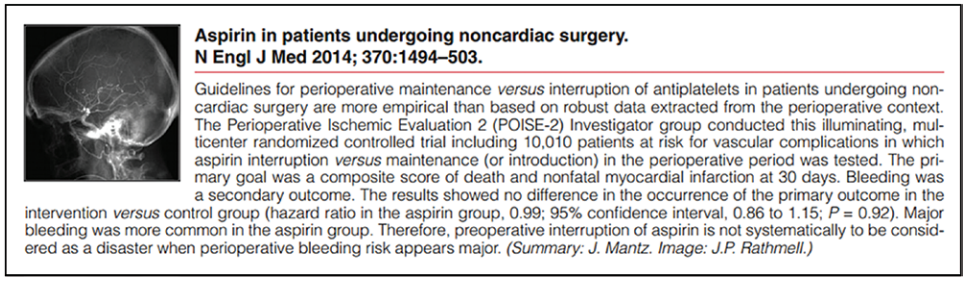
Below are but a few examples of recent articles highlighted in *Science, Medicine, and the Anesthesiologist*, which address the following key questions in daily practice in critical care, pain, and perioperative medicine:

Should we routinely give sedative premedication to surgical patients?


Effect of sedative premedication on patient experience after general anesthesia: A randomized clinical trial. JAMA 2015; 313:916–25.

Sedative premedication is widely administered before surgery, but little clinical evidence supports its use. This French multicenter randomized trial assessed the efficacy of sedative premedication on the perioperative inpatient experience. One thousand sixty-two adult patients scheduled for elective noncardiac, nonobstetrical, nonneurosurgical procedures were randomly allocated to receive either lorazepam (2.5 mg), no premedication, or placebo 2 h before surgery. The primary outcome criterion was patient experience assessed 24 h after surgery. It was found that sedative premedication with lorazepam compared with placebo or no premedication did not improve the self-reported patient experience the day after surgery, but was associated with modestly prolonged time to extubation and a lower rate of early cognitive recovery. These findings challenge the routine use of lorazepam as a sedative premedication in patients undergoing general anesthesia. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

How should perioperative antiplatelet therapy be managed?


Aspirin in patients undergoing noncardiac surgery. N Engl J Med 2014; 370:1494–503.

Guidelines for perioperative maintenance *versus* interruption of antiplatelets in patients undergoing noncardiac surgery are more empirical than based on robust data extracted from the perioperative context. The Perioperative Ischemic Evaluation 2 (POISE-2) Investigator group conducted this illuminating, multicenter randomized controlled trial including 10,010 patients at risk for vascular complications in which aspirin interruption *versus* maintenance (or introduction) in the perioperative period was tested. The primary goal was a composite score of death and nonfatal myocardial infarction at 30 days. Bleeding was a secondary outcome. The results showed no difference in the occurrence of the primary outcome in the intervention *versus* control group (hazard ratio in the aspirin group, 0.99; 95% confidence interval, 0.86 to 1.15; $P = 0.92$). Major bleeding was more common in the aspirin group. Therefore, preoperative interruption of aspirin is not systematically to be considered as a disaster when perioperative bleeding risk appears major. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

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Should we change our practices for mechanical ventilation in the operating room?

High *versus* low positive end-expiratory pressure during general anaesthesia for open abdominal surgery (PROVHILO trial): A multicentre randomised controlled trial. Lancet 2014; 384:495–503.

The IMPROVE multicenter trial has shown that the intraoperative use of low tidal volumes combined to application of high levels of positive end-expiratory pressure (PEEP) reduces the incidence of postoperative pulmonary complications in patients without lung injury. However, whether this beneficial effect comes from prevention of hyperinflation or avoidance of repetitive tidal recruitment remains uncertain. In this randomized controlled trial including 900 patients scheduled for abdominal surgery, a strategy with a high level of PEEP and recruitment maneuvers did not protect against postoperative pulmonary complications. This study further supports that an intraoperative protective ventilation strategy should include a low tidal volume and low PEEP without recruitment maneuvers. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

Is there a "best blood pressure" to be targeted during the early phase of septic shock?

High *versus* low blood-pressure target in patients with septic shock. N Engl J Med 2014; 370:1583–93.

It is uncertain whether the Surviving Sepsis Campaign recommendations targeting a mean arterial pressure of at least 65 mmHg during initial resuscitation of patients with septic shock are effective. A multicenter, open-label trial was conducted of 776 patients with septic shock randomized to undergo resuscitation with a mean arterial pressure target of either 80 to 85 mmHg (high-target group) or 65 to 70 mmHg (low-target group). No difference in mortality at either 28 or 90 days was found between the two groups. These findings leave open the discussion as to whether a target "best blood pressure level" can be recommended in patients with septic shock. *(Summary: J.F. Pittet. Image: J.P. Rathmell.)*

What novel biomarkers predict outcome after surgery?

Clinical recovery from surgery correlates with single-cell immune signatures. Sci Transl Med 2014; 6:255ra131.

In their recent publication, Gaudillière *et al.* demonstrate that specific immune cell subsets predict time to recovery from hip joint replacement surgery. To accomplish these analyses, single-cell mass cytometry was applied to whole blood taken from patients during and shortly after their procedures, and outcomes were followed for 6 weeks. The authors found that very early changes in specific populations of CD14+ monocytes correlated very strongly with fatigue, disability, and pain. The work implicated specific signaling pathways in these monocytes including STAT3, CREB, and NFκB. Unclear at this point is how these monocytes might be functioning to control the clinical recovery phenotypes. The work is of potentially very great significance as this approach might provide early biomarkers of long-term outcomes as well as provide novel insights as to why we see such large variability in recovery between patients after surgery. *(Summary: J.D. Clark. Image: J.P. Rathmell [monocyte micrograph by Dr. Graham Beards* via *Wikimedia Commons].)*

What is the role of high-fidelity simulation in education in the specialty?

Using simulation education with deliberate practice to teach leadership and resource management skills to senior resident code leaders. J Grad Med Educ 2014; 6:463–9.

Cardiopulmonary resuscitation (CPR) has matured to a point where evidence-based protocols provide patients with effective care, often resulting in the return of spontaneous circulation. Is there more room for improvement in CPR? Burden and her anesthesiology colleagues recently answered with a "Yes." They evaluated whether simulation education improved the crisis resource management (CRM) aspect of CPR. One group of residents received lecture-based education on communication and leadership during CPR; a second group received simulation-based education with practice on the same areas of communication and leadership. Both groups performed CPR during simulated scenarios after lecture or simulation CRM education and then again 6 months later. Residents that experienced simulated CRM education communicated and managed CPR teams better than those provided lecture-based CRM training. The clear inference is that simulation-based training may well have advantages for all trainees. *(Summary: A.J. Schwartz. Image: J.P. Rathmell.)*

We hope the new look of *Science, Medicine, and the Anesthesiologist* will better meet your needs. Review of Web usage, which demonstrates several hundred views per month, suggested that it does so. Finally, we would like to warmly thank all the individuals who have contributed to and developed this section from its inception: Timothy J. Brennan, Ph.D., M.D. (Departments of Anesthesia and Biostatistics, University of Iowa, Iowa City, Iowa), Lance Lichtor, M.D. (Departments of Anesthesiology and Pediatrics, Yale University School of Medicine, New Haven, Connecticut), Jean-François Pittet, M.D. (Department of Anesthesiology, University of Alabama at Birmingham, Birmingham, Alabama), Alan Jay Schwartz, M.D., M.S.Ed. (Department of Anesthesiology and Critical Care Medicine, The Children's Hospital of Philadelphia, Perelman School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania), and J. David Clark, M.D., Ph.D. (Stanford University School of Medicine, Stanford, California), and Franklin P. Cladys, M.D., F.A.A.P. (The Children Hospital of Pittsburgh of UPMC, Pittsburgh, Pennsylvania), and Cathleen Peterson-Layne, Ph.D., M.D. (Division of Women's Anesthesia, OB Anesthesia, Duke University, Durham, North Carolina).

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Competing Interests

Drs. Mantz and Rathmell receive honoraria from the American Society of Anesthesiologists for their service on the Editorial Board of Anesthesiology and are chiefly responsible for the *Science, Medicine, and the Anesthesiologist* section. Dr. Eisenach receives salary support from the American Society of Anesthesiologists as Editor-in-Chief of Anesthesiology.

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