



ON THE COVER:

Blood glucose should be monitored periodically intraoperatively in diabetic patients receiving insulin. In this issue of *ANESTHESIOLOGY*, Ehrenfeld *et al.* describe the use of an automatic system to identify diabetic patients, detect insulin administration, check for recent glucose measurement, and remind clinicians to check intraoperative glucose. They observed improved glucose monitoring, increased insulin administration, reduced recovery room hyperglycemia, and fewer surgical site infections after implementation of this automated alert. In an accompanying Editorial View, Simpao *et al.* discuss technology, digital quality improvement, and the care redesign process. This original research article was originally presented as part of the 2015 *ANESTHESIOLOGY* Journal Symposium: The Anesthesiologist and Healthcare Redesign.

- Ehrenfeld *et al.*: A Perioperative Systems Design to Improve Intraoperative Glucose Monitoring Is Associated with a Reduction in Surgical Site Infections in a Diabetic Patient Population, p. 431
- Simpao *et al.*: Should We Fear Computers or the Lack of Them? Technology, Digital Quality Improvement, and the Care Redesign Process, p. 369

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■ SPECIAL ARTICLE

- An Anesthesiologist's Perspective on the History of Basic Airway Management: The "Artisanal Anesthetic" Era: 1846 to 1904** 394
A. A. Matic

This second installment of the history of basic airway management discusses the early—"artisanal"—years of anesthesia (1846 to 1904). Basic airway maneuvers and devices were described and used on spontaneously breathing and apneic patients.

■ PERIOPERATIVE MEDICINE

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-   **Risk Factors and Clinical Outcomes Associated with Perioperative Transfusion-associated Circulatory Overload** 409
L. Clifford, Q. Jia, A. Subramanian, H. Yadav, D. R. Schroeder, and D. J. Kor
- In a case-control study design, the authors focused on a noncardiac surgical population and found association between transfusion-associated circulatory overload (TACO) and morbidity and mortality. While judicious transfusion practice is warranted to curb the incidence of TACO, this is of particular importance in patients with chronic kidney disease, cardiac dysfunction, and those using β -blockers or requiring emergency surgery, in whom the risk of TACO is greatest.
-  **Dexmedetomidine Disrupts the Local and Global Efficiencies of Large-scale Brain Networks** 419
J. A. Hashmi, M. L. Loggia, S. Khan, L. Gao, J. Kim, V. Napadow, E. N. Brown, and O. Akeju
- Using resting-state functional magnetic resonance in healthy human volunteers, it was shown that dexmedetomidine significantly reduced the local and global efficiencies of graph theory-derived networks, reduced the mean strength of network connectivity without impairing the degree distribution, and modulated functional connectivity within and between all resting-state networks. These findings strengthen the hypothesis that conscious processing relies on an efficient system of information transfer in the brain.
-   **A Perioperative Systems Design to Improve Intraoperative Glucose Monitoring Is Associated with a Reduction in Surgical Site Infections in a Diabetic Patient Population** 431
J. M. Ehrenfeld, J. P. Wanderer, M. Terekhov, B. S. Rothman, and W. S. Sandberg
- Use of an automatic system to identify diabetic patients, detect insulin administration, check for recent glucose measurement, and remind clinicians to check intraoperative glucose improved the reliability of intraoperative glucose management. After implementation of this automated reminder system, improved glucose monitoring, increased insulin administration, reduced recovery room hyperglycemia, and fewer surgical site infections were observed.
-   **Does a Platelet Transfusion Independently Affect Bleeding and Adverse Outcomes in Cardiac Surgery?** 441
F. M. A. van Hout, E. K. Hogervorst, P. M. J. Rosseel, J. G. van der Bom, M. Bentala, E. L. A. van Dorp, N. van Geloven, A. Brand, N. J. M. van der Meer, and L. M. G. van de Watering

In a retrospective, observational study with propensity matching of more than 23,000 patients, the authors show that platelet transfusions in cardiac surgery were associated with less blood loss but increases in some other perioperative factors including increased requirements for vasoactive medications, supportive ventilation, and prolonged intensive care. No association between platelet transfusion and surgical reinterventions, thrombotic complications, infections, organ failure, or mortality was found.

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M. R. Mathis, S. Sathishkumar, S. Kheterpal, M. D. Caldwell, F. D. Pagani, E. S. Jewell, and M. C. Engoren

This study characterized complications, risk factors, and staffing patterns for 246 patients with left ventricular assist devices undergoing 702 noncardiac surgical procedures. Intraoperative hypotension and acute kidney injury were the most common complications.

  **“Opt Out” and Access to Anesthesia Care for Elective and Urgent Surgeries among U.S. Medicare Beneficiaries** 461

E. C. Sun, F. Dexter, T. R. Miller, and L. C. Baker

This investigation examined a different dimension of access to care and the influence of “opt out”: the distance patients travel to obtain surgical procedures. For five common elective procedures and two common urgent procedures, “opt out” largely did not reduce the percentage of patients who traveled outside of their home zip code, and for patients who did travel outside of their zip code, “opt out” had no significant effect on the distance traveled. Results demonstrate that “opt out” was associated with little or no increased access to anesthesia care for several common procedures.

Retesting the Hypothesis of a Clinical Randomized Controlled Trial in a Simulation Environment to Validate Anesthesia Simulation in Error Research (the VASER Study) 472

A. F. Merry, J. A. Hannam, C. S. Webster, K.-E. Edwards, J. Torrie, C. Frampton, D. W. Wheeler, A. K. Gupta, R. P. Mahajan, R. Evley, and J. M. Weller

This investigation repeated the clinical trial, but in a smaller simulated trial, to determine if the same principal conclusion would be reached as in the actual clinical trial. The small simulated trial reached the same conclusion as the larger clinical trial, but the effect size was different. Caution is needed when extrapolating findings from research in simulated settings to clinical practice.

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V. S. Hambrecht-Wiedbusch, D. Li, and G. A. Mashour

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 **Cardiac Calcium Release Channel (Ryanodine Receptor 2) Regulation by Halogenated Anesthetics** 495

D. R. Laver, J. Attia, C. Oldmeadow, and A. W. Quail

The author's incorporated ryanodine receptor 2 (RyR2) receptors in an *in vitro* lipid bilayer model to show differential effects of clinically relevant concentrations of volatile anesthetics on RyR2 receptor activation. Halothane, desflurane, and enflurane produced RyR2 activation, while isoflurane and sevoflurane were ineffective in activating the RyR2 receptor. The study adds important mechanistic insight into the potential protective functions of volatile anesthetics on the ryanodine receptor and the heart.

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M. Cai, L. Tong, B. Dong, W. Hou, L. Shi, and H. Dong

In a preclinical model of middle cerebral artery occlusion in mice, the authors show that sevoflurane preconditioning works in part through enhancing nuclear translocation of a transcription factor known as nuclear factor-E2-related factor 2, which is a regulator of the antioxidant responses of the body. This preclinical research suggests new elements to our understanding of volatile anesthetic-induced neuroprotection that may lead to novel therapeutic targets for ischemic stroke.

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M. Raux, Y. Le Manach, T. Gauss, R. Baumgarten, S. Hamada, A. Harrois, and B. Riou, for the TRAUMABASE® Group

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R. van der Schrier, M. Roozkrans, E. Olofsen, L. Aarts, M. van Velzen, M. de Jong, A. Dahan, and M. Niesters

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