



ON THE COVER:

Forced-air warming during surgery is now routine, yet we know little about core temperature patterns in patients warmed with forced air. The effects of transient and mild intraoperative hypothermia on patient outcomes are unknown. In this issue of *ANESTHESIOLOGY*, Sun and colleagues analyzed data from almost 59,000 adults having surgery lasting more than an hour, and demonstrated that core temperatures decreased during the first hour of surgery, rising thereafter to an average final temperature of 36.3°C. Hypothermia significantly increased transfusion requirements and duration of hospitalization. In an accompanying Editorial View, Hopf discusses the evolution of our understanding of the physiology of intraoperative hypothermia and its consequences and calls for new standards for prevention and identification of hypothermia in the operating room.

- Sun *et al.*: Intraoperative Core Temperature Patterns, Transfusion Requirement, and Hospital Duration in Patients Warmed with Forced Air, p. 276
- Hopf: Perioperative Temperature Management: Time for a New Standard of Care?, p. 229

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The American Society of Anesthesiologists Committee on Standards and Practice Parameters and the Task Force on Perioperative Blood Management presents an updated report of the Practice Guidelines for Perioperative Blood Management.

■ PERIOPERATIVE MEDICINE

CLINICAL SCIENCE

- CME ◆ **Intraoperative Core Temperature Patterns, Transfusion Requirement, and Hospital Duration in Patients Warmed with Forced Air** 276

Z. Sun, H. Honar, D.I. Sessler, J.E. Dalton, D. Yang, K. Panjasawatwong, A.F. Deroee, V. Salmasi, L. Saager, and A. Kurz

In almost 59,000 adults having surgery lasting more than an hour, core temperatures decreased during the first hour of surgery, thereafter rising to an average final temperature of 36.3°C. Hypothermia significantly increased both transfusion requirements and duration of hospitalization, but only the increase in transfusions was clinically important.

- ◆ **Effect of Lateral Tilt Angle on the Volume of the Abdominal Aorta and Inferior Vena Cava in Pregnant and Nonpregnant Women Determined by Magnetic Resonance Imaging** 286

H. Higuchi, S. Takagi, K. Zhang, I. Furui, and M. Ozaki

In 10 singleton parturients at term without anesthesia, the aorta at the mid- to upper lumbar disk levels was not compressed, although the inferior vena cava was. Tilt of 30°, but not 15°, partially relieved the inferior vena caval compression.

- ◆ **Sodium Bicarbonate and Renal Function after Cardiac Surgery: A Prospectively Planned Individual Patient Meta-analysis** 294

M. Bailey, S. McGuinness, M. Haase, A. Haase-Fielitz, R. Parke, C.L. Hodgson, A. Forbes, S.M. Bagshaw, and R. Bellomo

The authors have performed a novel, prospectively planned individual patient data meta-analysis of the double-blind randomized trials in this important field. Urinary alkalization with sodium bicarbonate infusion is not associated with a significant reduction in the overall risk of acute kidney injury in cardiac surgery patients. However, urinary alkalization was associated with significant renal protection in the subgroup of patients undergoing elective coronary artery bypass graft surgery suggesting that further investigation in these patients is warranted.

- ◆ **Neurophysiological Correlates of Sevoflurane-induced Unconsciousness** 307

S. Blain-Moraes, V. Tarnal, G. Vanini, A. Alexander, D. Rosen, B. Shortal, E. Janke, and G.A. Mashour

In human volunteers, sevoflurane-induced unconsciousness was not consistently correlated with anteriorization of alpha rhythms or frontal cross-frequency coupling patterns, but rather disrupted phase relationships between frontal and posterior brain structures. Since other agents induce disrupted phase relationships, network fragmentation may be a common correlate or cause of anesthetic-induced unconsciousness.

- ◆ **Factors Associated with Improved Survival after Resection of Pancreatic Adenocarcinoma: A Multivariable Model** 317

T.R. Call, N.L. Pace, D.B. Thorup, D. Maxfield, B. Chortkoff, J. Christensen, and S.J. Mulvihill

A model based on retrospective analysis of the records of 144 patients who underwent resection of pancreatic adenocarcinoma between 2001 and 2011 predicted median survival of patients to whom dexamethasone is administered and who have epidural analgesia would be increased from 370 days to 651 days compared to similar patients receiving neither dexamethasone nor epidural analgesia.

BASIC SCIENCE

- ◆ **Discovery of a Novel General Anesthetic Chemotype Using High-throughput Screening** 325
A.R. McKinstry-Wu, W. Bu, G. Rai, W.A. Lea, B.P. Weiser, D.F. Liang, A. Simeonov, A. Jadhav, D.J. Maloney, and R.G. Eckenhoff

A high-throughput assay based on competitive binding to a soluble protein model was used to screen a library of more than 350,000 compounds for anesthetic-like binding activity. A novel chemotype, the 6-phenylpyridazin-3(2H)-ones, exhibited general anesthetic activity in secondary assays and ultimately in mice.

- Overexpression of Cyclic Adenosine Monophosphate Effluent Protein MRP4 Induces an Altered Response to β -Adrenergic Stimulation in the Senescent Rat Heart** 334
A. Carillion, S. Feldman, C. Jiang, F. Atassi, N. Na, N. Mougenot, S. Besse, J.-S. Hulot, B. Riou, and J. Amour

MRP4 is overexpressed in the senescent rat heart and is involved in the limited positive inotropic response of the senescent heart to β -adrenergic stimulation. MRP4 may be a therapeutic target for altering the inotropic reserve of elderly patients.

- ◆ **Possible Pathogenic Mechanism of Propofol Infusion Syndrome Involves Coenzyme Q** 343
A.V. Vanlander, J.G. Okun, A. de Jaeger, J. Smet, E. De Lattre, B. De Paepe, G. Dacremont, B. Wuyts, B. Vanheel, P. De Paepe, P.G. Jorens, N. Van Regenmortel, and R. Van Coster

In eight rats sedated for up to 20 h with gradually increasing doses of propofol, succinate cytochrome c reductase (complex II+III) was the most sensitive to inhibition by propofol. The activities of complex II and complex III were not decreased when tested individually, suggesting propofol interferes with coenzyme Q, which transfers electrons from complex II to complex III.

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Using a cell-based coagulation model, the ability of either prothrombin complex concentrate or recombinant factor VIIa to restore hemostasis in the presence of dabigatran depends on the dose of procoagulant used and the level of dabigatran present and may explain the inconsistency of effects in different models and when used off label for treating bleeding.

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M. Hayes, C. Masterson, J. Devaney, F. Barry, S. Elliman, T. O'Brien, D. O'Toole, G.F. Curley, and J.G. Laffey

Rats with ventilator-induced lung injury who received human mesenchymal stromal cells had enhanced lung repair and improved oxygenation compared to rats who received vehicle or fibroblasts. Mesenchymal stromal cell treatment was also associated with improved lung compliance, decreased alveolar edema, and restored lung architecture. The mechanism for improvement appeared to be in part decreased inflammation and decreased alveolar cell neutrophil.

- Hepatic Hepcidin Protects against Polymicrobial Sepsis in Mice by Regulating Host Iron Status** 374
C. Zeng, Q. Chen, K. Zhang, Q. Chen, S. Song, and X. Fang

Disruption of mouse hepatic hepcidin expression led to significant increases in organ damage and mortality when sepsis was produced. Decreasing the iron levels in these mice improved survival.

- Effective Reversal of Edoxaban-associated Bleeding with Four-factor Prothrombin Complex Concentrate in a Rabbit Model of Acute Hemorrhage** 387
E. Herzog, F. Kasperleit, W. Krege, B. Doerr, J. Mueller-Cohrs, I. Pragst, Y. Morishima, and G. Dickneite

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P. Vanelderen, J. Van Zundert, T. Kozicz, M. Puylaert, P. De Vooght, R. Mestrum, R. Heylen, E. Roubos, and K. Vissers

In a controlled trial of 60 patients with subacute lumbar radicular pain, a 2-week treatment with minocycline or amitriptyline reduced pain compared to placebo. Reductions in pain over this short time period were small and unlikely to be clinically significant.

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A new mutation, p.L1612P, was found in four family members suffering from Paroxysmal Extreme Pain Disorder. The mutant ion channel possesses unique electrophysiological characteristics, and a pharmacological profile distinct from other known mutations.

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J. Ren, X. Ding, and J.J. Greer

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