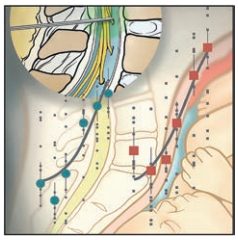
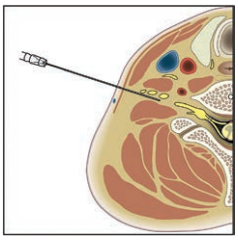
THIS MONTH IN

ANESTHESIOLOGY



934 A Random-allocation Graded Dose–Response Study of Norepinephrine and Phenylephrine for Treating Hypotension during Spinal Anesthesia for Cesarean Delivery

Administration of phenylephrine to maintain blood pressure during spinal anesthesia for cesarean delivery is often associated with a reflex decrease in heart rate and cardiac output. Norepinephrine is a potent α-adrenergic agonist and has weak β-adrenergic agonist activity, which counteracts reflex slowing of heart rate. A randomized double-blinded graded dose–response study of norepinephrine and phenylephrine was conducted in 180 healthy patients having spinal anesthesia for cesarean delivery to determine the relative potencies of phenylephrine and norepinephrine when given as a bolus to treat hypotension. The response measured was the proportion of full restoration of systolic blood pressure to the baseline value. The calculated potency ratio for norepinephrine:phenylephrine was 13.1 (95% CI, 10.4 to 15.8), which suggests that the norepinephrine dose that would be equivalent to a 100-μg phenylephrine dose in obstetric patients is 7.6 μg (95% CI, 6.3 to 9.6 μg). *(Summary: M. J. Avram. Illustration: A. Johnson, Vivo Visuals.)*



998 Suprascapular and Interscalene Nerve Block for Shoulder Surgery: A Systematic Review and Meta-analysis

Although interscalene nerve blockade provides optimal analgesia for shoulder surgery patients, it carries a high risk of transient and potentially long-term respiratory complications and nerve damage. Because suprascapular nerve block may produce sufficient analgesia after shoulder surgery, it has been proposed as an alternative to interscalene nerve block. Data from 16 studies involving 1,152 patients were analyzed in a systematic review and meta-analysis that compared the analgesic effect, measured by analgesic consumption and pain severity during the first 24 h postoperatively, of suprascapular nerve block *versus* interscalene nerve blockade in adult patients having shoulder surgery. There was high-level evidence suggesting that the blocks are not different for postoperative oral morphine consumption at 24 h and area under the curve of pain severity scores at rest during the first 24 h postoperatively. Suprascapular block appeared to reduce the risk of block-related complications. *(Summary: M. J. Avram. Image: G. Nelson.)*

918 Effect of Xenon Anesthesia Compared to Sevoflurane and Total Intravenous Anesthesia for Coronary Artery Bypass Graft Surgery on Postoperative Cardiac Troponin Release: An International, Multicenter, Phase 3, Single-blinded, Randomized Noninferiority Trial

Myocardial ischemia provoked by the aortic clamping and subsequent reperfusion of the heart remains a significant clinical challenge in coronary artery bypass graft (CABG) surgery. Potent volatile anesthetics are thought to be cardioprotective and to result in less ischemia-reperfusion injury during cardiac surgery. A prospective, randomized, three-arm, single-blinded, multicenter, noninferiority study tested the hypothesis that xenon- and sevoflurane-based anesthesia would similarly and favorably limit postoperative myocardial damage compared to propofol-based total intravenous anesthesia in 492 patients undergoing elective on-pump CABG surgery. Myocardial damage assessed by postoperative release of cardiac troponin I at 24 h after surgery was the primary outcome. Xenon anesthesia was noninferior to sevoflurane anesthesia in preventing cardiac troponin I release at 24 h after on-pump CABG surgery. Although xenon was not superior to sevoflurane in this regard, it was superior to propofol-based total intravenous anesthesia, whereas sevoflurane was not. *See the accompanying Editorial View on* ***page 918****.* *(Summary: M. J. Avram. Image: J. P. Rathmell.)*

942 Association between Intrapartum Magnesium Administration and the Incidence of Maternal Fever: A Retrospective Cross-sectional Study

Maternal fever, which can have an inflammatory etiology, complicates up to one third of all labors and is associated with several adverse neonatal outcomes. Magnesium sulfate is reported to be protective in inflammatory models of neonatal brain injury and may attenuate maternal inflammatory fever. The hypothesis that intrapartum exposure to magnesium therapy is associated with a lower incidence of maternal fever (defined as a temperature of 100.4°F [38.0°C] or higher) than no magnesium exposure was tested in a retrospective cross-sectional study of 58,541 parturients who delivered at a single medical center between 2007 and 2014. Of the 52,617 afebrile patients, 1,108 (2.1%) received intrapartum magnesium, while 71 (1.2%) of the 5,924 febrile patients received it. In a multivariable logistic regression model, intrapartum magnesium therapy was associated with lower odds of maternal fever (adjusted odds ratio 0.42; 95% CI, 0.31 to 0.58). *(Summary: M. J. Avram. Image: J. P. Rathmell.)*

989 Prevalence and Prognosis Impact of Patient–Ventilator Asynchrony in Early Phase of Weaning according to Two Detection Methods

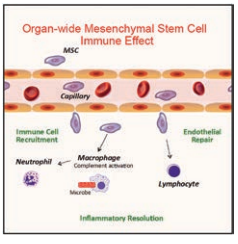
An ancillary study of a multicenter randomized controlled trial, in which patient–ventilator asynchrony was quantified homogeneously during the early phase of weaning, evaluated the prognostic impact and the factors associated with patient–ventilator asynchrony using two detection methods: an analysis restricted to the inspection of airway flow and pressure signal and a computerized method integrating electromyographic activity of the diaphragm as a surrogate of patient inspiratory time. Data for the prevalence of asynchrony were available for 103 patients, 53 in a neurally-adjusted ventilatory assist group and 50 in a pressure support ventilation group. Patient–ventilator asynchrony in the early phase of weaning was not associated with adverse clinical outcome, regardless of the method of detection. The prevalence of asynchrony was higher when based on the electromyographic activity of the diaphragm signal than when based on the flow and pressure recordings. *See the accompanying Editorial View on* **page 915**. *(Summary: M. J. Avram. Image: J. P. Rathmell.)*

953 Impact of Public Reporting of 30-day Mortality on Timing of Death after Coronary Artery Bypass Graft Surgery

Public reporting of 30-day mortality metrics in cardiac surgery may lead to delayed decisions to withdraw life-sustaining therapies for some patients to prevent their deaths from counting as adverse events. The hypothesis that public reporting of surgical outcomes affects the timing of withdrawal of life-sustaining therapy would be most likely to occur in a state using the 30-day mortality metric was tested in a retrospective cohort study of patients who underwent coronary artery bypass graft surgery between 2008 and 2013 by comparing the timing of death for patients in Massachusetts, which publicly reports 30-day mortality rates, with that of patients in New York, which publicly reports the combined metric of 30-day and all in-hospital mortality. There was no evidence of increased in-hospital deaths occurring after the 30-day mark, suggesting that use of this quality metric does not result in obvious delays in altering goals of care for patients dying in the hospital. *(Summary: M. J. Avram. Image: J. P. Rathmell.)*

976 Anesthesia with Dexmedetomidine and Low-dose Isoflurane Increases Solute Transport *via* the Glymphatic Pathway in Rat Brain When Compared with High-dose Isoflurane

The glymphatic pathway clearance of waste from the brain increases during slow-wave sleep and general anesthesia. Reduced brain waste removal during wakefulness is associated with central norepinephrine activity. The hypothesis that unconsciousness produced in rats receiving supplementary dexmedetomidine, a potent selective α2-adrenergic agonist that blocks central norepinephrine release, would enhance glymphatic transport more than that produced in rats receiving only isoflurane was tested using a magnetic resonance imaging–based platform for quantifying glymphatic transport. Brain-wide glymphatic transport of the low molecular weight paramagnetic contrast agent, gadopentetic acid, over a 180-min cerebrospinal fluid circulation period (area under the curve 180), was 32% more in female rats anesthetized with dexmedetomidine and low-dose isoflurane than it was in rats anesthetized with isoflurane alone. Thus, the effect of anesthetics on the glymphatic pathway transport appears to involve more than simply inducing unconsciousness. *(Summary: M. J. Avram. Image: J. P. Rathmell.)*



1017 Stem Cell–based Therapies for Sepsis (Review Article)

Sepsis is a life-threatening syndrome resulting in shock and organ dysfunction due to microbial infection. It has an overall mortality of 40% and is implicated in half of all in-hospital deaths. The early phase of sepsis is characterized by a hyperinflammatory immune response, whereas the later phase is often complicated by immunosuppression. While management of sepsis remains supportive, stem cells represent exciting potential therapeutic agents. The rationale for their use in sepsis is reviewed, focusing on mesenchymal stem/stromal cells, which seem to have the greatest therapeutic promise. Studies of the use of stem cells in multiple animal models of sepsis are reviewed as are potential mechanisms of action of these cells that are important in the setting of sepsis. Early-phase clinical trials are then discussed and translational barriers to the use of mesenchymal stem/stromal cells in patients with sepsis appraised. *(Summary: M. J. Avram. Illustration: Adapted from original article.)*