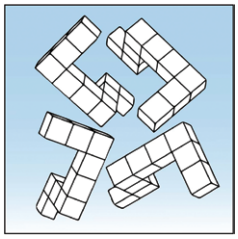
THIS MONTH IN

ANESTHESIOLOGY

997 Regional and Gender Differences and Trends in the Anesthesiologist Workforce

A national survey of members of the American Society of Anesthesiologists was conducted in 2013. Workforce trends between 2007 and 2013 of a sample of 6,783 individuals were documented by region of the United States and by sex because such trends may have implications for the supply and demand of anesthesiologists. Compared to anesthesiologists in other regions, Western anesthesiologists were more likely to work in larger group-employer settings and receive fee-for-service compensation, were less likely to work with nurse anesthetists, and were less likely to spend time performing or overseeing monitored anesthesia care. Female anesthesiologists received lower levels of compensation, worked fewer hours, were more likely to work for facilities as employees, and allocated time across different types of patients. In many cases these sex differences were related. *See the accompanying Editorial View on* ***page 983****. (Summary: M.J. Avram. Photo: Diemut Strebe/J.P. Rathmell.)*

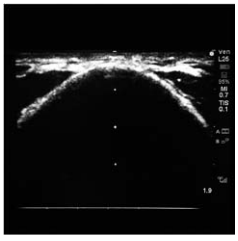


1024 Initial Experience of an Anesthesiology-based Service for Perioperative Management of Pacemakers and Implantable Cardioverter Defibrillators

Surgeries involving use of equipment that emits electromagnetic radiation present a management challenge in patients with cardiovascular implantable electronic devices (CIED). Qualified individuals familiar with the patient and their CIED programming should provide recommendations to caregivers on the day of surgery. Because slow response times of cardiology fellows delayed case starts, an anesthesiologist-based service was developed for perioperative CIED management. This retrospective review describes experience with that service. Between 2009 and 2013, the Electrophysiology/Cardiology Service managed 250 CIED, the Anesthesia Device Service managed 548, and 227 were managed by neither. Average first case delay time for the Anesthesia Device Service was half that for the Electrophysiology/Cardiology Service but to-follow case delay times were similar. Anesthesia Device Service CIED management errors were uncommon and became less frequent over time. *See the accompanying Editorial View on* ***page 990****. (Summary: M.J. Avram. Illustration: J.P. Rathmell.)*

1059 Preoperative Surgical Risk Predictions Are Not Meaningfully Improved by Including the Surgical Apgar Score: An Analysis of the Risk Quantification Index and Present-On-Admission Risk Models

The present retrospective study sought to determine if performance of preoperative risk estimates by the Risk Quantification Indices (RQI) and the Present-On-Admission Risk (POARisk) models would be improved by incorporating intraoperative risk estimates of the Surgical Apgar Score (SAS) for adult patients who underwent noncardiac surgery between 2008 and 2013. For the 44,835 patients with data required for the RQI, the areas under the receiver operating characteristic curves were 0.64 for SAS, 0.8422 for RQI 30-day mortality, and 0.8524 when SAS was included with RQI. For the 110,273 patients with data required for the POARisk, the areas under the receiver operating characteristic curves were 0.63 for the SAS, 0.8608 for POARisk in-hospital mortality, and 0.8645 when SAS was included with POARisk. Neither preoperative risk model was meaningfully improved by addition of the SAS. *(Summary: M.J. Avram. Image: J.P. Rathmell.)*



1033 Ultrasound Improves Cricothyrotomy Success in Cadavers with Poorly Defined Neck Anatomy: A Randomized Control Trial

Inaccurate identification of the cricothyroid membrane using digital palpation results in airway device misplacement and other adverse outcomes. The outcomes of cricothyrotomies performed on human cadavers using ultrasound guidance were compared to those using conventional digital palpation of anatomical landmarks. Forty-seven anesthesia residents and fellows with no previous experience in neck ultrasonography and who had not performed a cricothyrotomy in the previous 6 months were randomized to the digital palpation group or the ultrasound group. Compared to conventional digital palpation, ultrasonography increased the probability of correct insertion of a Portex® cricothyrotomy device (Smiths Medical, USA) *via* the cricothyroid membrane by 5.6 times and decreased the incidence of moderate–severe injuries to the larynx or trachea by two thirds in cadavers with difficult or impossible to palpate anatomical landmarks. *See the accompanying Editorial View on* ***page 995****. (Summary: M.J. Avram. Image: Transverse ultrasound image of the trachea at the level of the cricothyroid membrane; J.P. Rathmell.)*

1105 Risk of a Diagnosis of Dementia for Elderly Medicare Beneficiaries after Intensive Care

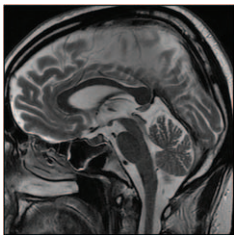
Cognitive impairment increases after critical illness, but the magnitude of the effect has not been adequately estimated. From a 2.5% sample of Medicare beneficiaries, 10,348 hospitalized with admission to intensive care in 2005 were identified and matched for age, sex, and race with general population controls. In the intensive care cohort, 1,648 (15.9%) received a new diagnosis of dementia during the 3-yr follow-up *versus* 1,266 (12.2%) of controls. The overall rate of new diagnoses of dementia was 73.6 per 1,000 person-years for the intensive care cohort and 45.8 per 1,000 person-years for controls, with a hazard ratio of 1.61. The increased risk for critically ill patients seems attributable to the pericritical illness period, because preexisting risk factors did not fully account for the increased risk. *(Summary: M.J. Avram. Image: J.P. Rathmell.)*

1013 Temporal Trends in Anesthesia-related Adverse Events in Cesarean Deliveries, New York State, 2003–2012

Between 2003 and 2012, 785,854 discharges indicating cesarean delivery were recorded in the State of New York. The cesarean delivery rate increased from 28.7% in 2003 to 34.7% in 2009 and remained stable. The proportion of cesarean deliveries under general anesthesia decreased from 7.5% in 2003 to 6.0% in 2012. Anesthesia-related adverse events were recorded among 5,715 discharges (730 per 100,000). Of 11,093 adverse events, 5.7% were major. Anesthesia-related adverse events decreased from 890 per 100,000 in 2003 to 660 per 100,000 in 2012; the major event rate decreased 43% while the minor event rate decreased 23%. Nonanesthetic perioperative complications increased from 770 per 100,000 in 2003 to 1,130 per 100,000 in 2012. Maternal mortality decreased from 34 per 100,000 in 2003 to 16 per 100,000 in 2012. *See the accompanying Editorial View on* ***page 986***. *(Summary: M.J. Avram. Image: ©Thinkstock.)*

1133 Trends in Pain Medicine Liability

Trends in pain medicine malpractice claims for anesthesiologists were analyzed using the Anesthesia Closed Claims Project Database of 10,367 claims for injuries that occurred between 1980 and 2012. Malpractice claims for pain medicine increased from 3% of 2,966 total malpractice claims in 1980–1989 to 18% of 2,743 claims in 2000–2012. Death and permanent disabling injury increased from 21% of 95 pain medicine claims in the 1980s to 55% of 505 such claims in the 2000s. Cervical injections represented 16% of claims in the 1980s and 27% in the 2000s. Permanent disabling nerve injury associated with cervical injections was their most common complication in the 2000s. The proportion of cervical procedure claims was nearly twice their proportional representation among National Anesthesia Clinical Outcomes Registry pain procedures. *(Summary: M.J. Avram. Image: J.P. Rathmell.)*



1198 Cardiac Output and Cerebral Blood Flow: The Integrated Regulation of Brain Perfusion in Adult Humans (Review Article)

Cerebral blood flow is regulated by a set of powerful mechanisms, including cerebral autoregulation, neurovascular coupling, and cerebrovascular carbon dioxide and oxygen reactivity, to safeguard matching of cerebral metabolic demand and supply. While cardiac output contributes to cerebral blood flow regulation, how an alteration in cardiac output leads to a change in cerebral blood flow in the face of a stable blood pressure is unclear. This review examines evidence of the association between cardiac output and cerebral blood flow in adult humans under various conditions. A revised conceptual framework that integrates different regulatory mechanisms of brain perfusion, including the role of blood pressure and cardiac output, is presented. Clinical implications pertinent to the effect of cardiac output on cerebral blood flow are discussed. *(Summary: M.J. Avram. Image: J.P. Rathmell.)*