



### Neuraxial Anesthesia in Parturients with Intracranial Pathology: A Comprehensive Review and Reassessment of Risk (Review Article) 703

After a brief review of intracranial anatomy and physiology, principles of intracranial compliance are applied to case examples to help determine when harm could result from reduced lumbar cerebrospinal fluid volume resulting from a spinal anesthetic, accidental dural puncture during epidural catheter placement, or epidural catheter dosing.

### Oxytocin Pretreatment Attenuates Oxytocin-induced Contractions in Human Myometrium *In Vitro* 552

Pretreatment of isolated myometrium from 62 non-laboring term pregnant women undergoing elective cesarean deliveries with oxytocin decreased oxytocin-induced contractions in a concentration- and time-dependent manner. Oxytocin-induced receptor desensitization may explain increased oxytocin dose requirements and bleeding in women who have undergone oxytocin-augmented labor.

### Different Propofol–Remifentanyl or Sevoflurane–Remifentanyl Bispectral Index Levels for Electrocorticographic Spike Identification during Epilepsy Surgery 582

Twenty-two medically intractable epilepsy patients were randomly assigned to anesthesia with either propofol or sevoflurane, titrated to bispectral index endpoints ranging from 85 to 40, for epilepsy surgery. Increasing anesthetic depth enhanced the morphology of epileptogenic spike frequency and amplitude and may facilitate intraoperative electroencephalographic detection of epileptiform foci.

### Intrathecal Gabapentin to Treat Chronic Intractable Noncancer Pain 675

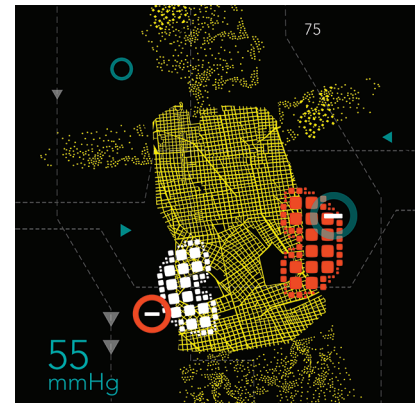
A randomized, double blind, placebo-controlled trial of continuous intrathecal gabapentin was conducted in 170 patients with a variety of chronic, noncancer pain diagnoses. Twenty-two days of intrathecal gabapentin at doses of 1, 6, or 30 mg/day did not produce any statistically significant or clinically meaningful analgesia.

### Prospective Randomized Crossover Study of a New Closed-loop Control System versus Pressure Support during Weaning from Mechanical Ventilation 631

Fourteen patients were ventilated with pressure support ventilation or Intellivent, in a random order, for two 24-h periods during weaning from mechanical ventilation. Intellivent improved the  $\text{PaO}_2/\text{FiO}_2$  ratio at 24 h, with more variability in airway pressures, PEEP, and  $\text{FiO}_2$ . More frequent ventilator adjustments may explain better oxygenation.

### Relationship between Intraoperative Mean Arterial Pressure and Clinical Outcomes after Noncardiac Surgery: Toward an Empirical Definition of Hypotension 507

Intraoperative hypotension may be an important factor in the development of postoperative complications. Data from 27,381 patients undergoing 33,330 noncardiac surgeries were studied to determine the durations of various mean arterial pressures (MAP) that were associated with acute kidney injury and myocardial injury. Acute kidney injury occurred after 7.4% of surgeries while myocardial injury occurred after 2.3% of surgeries and 1.5% of patients died within 30 days of surgery. Any time spent with a MAP of less than 55



mmHg during noncardiac surgery was independently associated with an increased risk of acute kidney injury and myocardial injury. As the time with a MAP of less than 55 mmHg increased so too did the risk for acute kidney injury and myocardial injury. Thirty-day mortality was associated with more than 20 min of MAP less than 55 mmHg. Optimizing intraoperative hemodynamics may improve patient outcomes. *See the accompanying Editorial View on page 495*

### Isoflurane, a Commonly Used Volatile Anesthetic, Enhances Renal Cancer Growth and Malignant Potential *via* the Hypoxia-inducible Factor Cellular Signaling Pathway *In Vitro* 593

Perioperative events may influence cancer recurrence, metastasis, and long-term survival. Isoflurane can upregulate hypoxia inducible factors (HIFs), a family of transcription factors that govern expression of genes that help ensure a cell's survival and adaptation to its environment and that have been implicated in tumorigenesis. Renal cell carcinoma cells were exposed to isoflurane concentrations ranging from 0.5% to 2.0% for 2 h under normoxic conditions after which they were harvested at various times up to 24 h to determine its effect on the HIF pathway. Clinically relevant concentrations of isoflurane increased renal carcinoma cell proliferation and cell migration by inducing HIF expression in a time- and concentration-dependent manner through the phosphatidylinositol 3-kinase (PI3K)/Akt/mammalian target of rapamycin (mTOR) pathway. In addition, isoflurane enhanced expression of the pro-angiogenic vascular endothelial growth factor A. Thus, isoflurane not only enhanced renal cancer cell growth but also affected their malignant potential *in vitro*. *See the accompanying Editorial View on page 501*

### Validation of a Risk Stratification Index and Risk Quantification Index for Predicting Patient Outcomes: In-hospital Mortality, 30-day Mortality, 1-year Mortality, and Length-of-stay 525

Risk Stratification Indices (RSIs) and Risk Quantification Indices (RQIs) were developed to predict mortality and other clinical endpoints from administrative patient data. Using patient data from the Massachusetts General Hospital in this external validation study, the RSIs calculated for 91,128 adult, noncardiac surgeries had excellent discrimination (the probability measured risk is higher for a case than it is for a noncase) but poor calibration (how well predicted outcomes agree with actual). The 30-day mortality RQI calculated for 62,640 patients performed well. The poor calibration of existing RSI models raises concerns about their generalizability. Although a robust capture of Current Procedural Terminology (CPT) codes is important for 30-day mortality RQI calculation, a relatively high rate of unmatched CPT codes (28,488/91,128 cases, 31.3%) was observed.