



## 18 Cumulative Duration of “Triple Low” State of Low Blood Pressure, Low Bispectral Index, and Low Minimum Alveolar Concentration of Volatile Anesthesia Is Not Associated with Increased Mortality

A triple low state, low mean arterial pressure and a low bispectral index during low minimum alveolar concentration fraction of volatile anesthetic, may identify patients at risk for perioperative mortality after noncardiac surgery because of their unusual anesthetic sensitivity. Data were extracted from records of 16,263 patients who underwent noncardiac surgery between 2006 and 2009, 0.8% of whom died within 30 days of their operation and 9.5% of 16,133 patients died during the intermediate postoperative term. After adjusting for differences in baseline and clinical characteristics, the cumulative duration of the triple low

state was not associated with 30-day or intermediate-term postoperative mortality. *See the accompanying Editorial View on page 1.* (Summary: M.J. Avram. Image: ©Thinkstock.)



## 29 Predictors of Patient Medication Compliance on the Day of Surgery and the Effects of Providing Patients with Standardized yet Simplified Medication Instructions

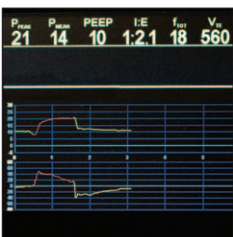
Patients receiving preoperative medication instructions often fail to comply with this information. As part of a quality improvement study, 519 patients received education and instruction about taking medications on the day of surgery in the existing, unstandardized manner. After a 6-week washout period, another 531 patients received a newly created, standardized, multicolored, pictorial Preoperative Patient Medication Instruction Sheet. Implementation of the new instruction sheet increased patient medication compliance

on the day of surgery from 60% to 74%. African-American patients, older patients, and patients with greater comorbidities may need a more concerted effort to achieve preoperative medication compliance. (Summary: M.J. Avram. Image: J.P. Rathmell.)



## 52 Aspiration Induced by Remifentanyl: A Double-blind, Randomized, Crossover Study in Healthy Volunteers

Use of remifentanyl for monitored anesthesia care in spontaneously breathing patients may increase the risk of pulmonary aspiration. Twenty-five volunteers were studied twice in a randomized, crossover study with infusions of saline and remifentanyl, targeted to produce effect site concentrations used in monitored anesthesia care, for an hour. Pulmonary aspiration was detected when a radionuclide solution infused simultaneously into the nasopharynx was detected in the lung. Aspiration was observed in 48% of the volunteers during remifentanyl infusion and in 12% during placebo infusion. Swallowing difficulties were reported by only 7 of the 12 volunteers who aspirated during the remifentanyl infusion. (Summary: M.J. Avram. Photo: J.P. Rathmell.)



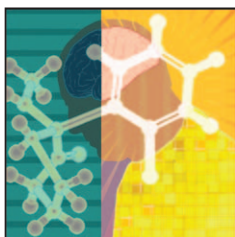
## 184 Lung-protective Ventilation in the Operating Room: Time to Implement? (Clinical Concepts and Commentary)

Because lower tidal volume was shown to improve survival in ventilated patients with acute respiratory distress syndrome (ARDS), it has been adopted as a standard of care in patients with ARDS. A recent clinical trial led some to suggest a lower tidal volume ventilation strategy be adopted for surgical patients. However, a review of available evidence raises the possibility that protective ventilation during anesthesia may be beneficial when both lower tidal volume and a recruitment strategy are used, not lower tidal volume alone. A large-scale trial to identify the ideal approach to intraoperative ventilation is recommended before changing clinical practice. (Summary: M.J. Avram. Image: J.P. Rathmell.)



### 171 Predicting Case Volume from the Accumulating Elective Operating Room Schedule Facilitates Staffing Improvements (Original Investigations in Education)

Final operating room demand can typically be estimated with precision only 1 or 2 days before the day of surgery. An engineering approach was used to develop a prediction model of final case volume based on a dataset consisting of a sequential series of 146 nonholiday weekdays, for each of which the accumulated number of cases booked each day going back to 30 calendar days from the day of surgery at one academic medical center was available. The model's predictions were sufficiently accurate, especially 4 to 6 days before the day of surgery, to allow managers to adjust staffing by rescheduling. See the accompanying Editorial View on page 6. (Summary: M.J. Avram. Image: ©Thinkstock.)



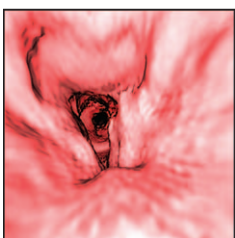
### 149 (R,S)-Ketamine Metabolites (R,S)-Norketamine and (2S,6S)-Hydroxynorketamine Increase the Mammalian Target of Rapamycin Function

Anesthetic effects of ketamine are associated with noncompetitive inhibition of the *N*-methyl-D-aspartate receptor by (*R,S*)-ketamine, with contributions from its metabolite (*R,S*)-norketamine but not from its metabolite (*2S,6S;2R,6R*)-hydroxynorketamine. A subanesthetic dose of (*R,S*)-ketamine relieves depression-like behaviors in rats suffering from neuropathic pain. Administration of not only (*R,S*)-ketamine but also of its metabolites (*R,S*)-norketamine and (*2S,6S*)-hydroxynorketamine activated the mammalian target of rapamycin signaling pathway in rat prefrontal cortex tissue, which has been associated with the antidepressant effects of (*R,S*)-ketamine. This effect was likely initiated by antagonism at the  $\alpha_7$ -nicotinic acetylcholine receptor and was reflected by increased expression of monomeric serine racemase. See the accompanying Editorial View on page 4. (Summary: M.J. Avram. Illustration: A. Johnson, Vivo Visuals.)



### 189 Mechanical Ventilation–associated Lung Fibrosis in Acute Respiratory Distress Syndrome: A Significant Contributor to Poor Outcome (Review Article)

Mechanical ventilation is the most important supportive therapy for patients with acute respiratory distress syndrome, many of whom survive the acute phase of their illness only to go on to die with evidence of significant pulmonary fibrosis. Mechanical ventilation can cause injury by not only structural disruption of the lung but also induction of inflammatory response. Evidence supporting the hypothesis that ventilator-induced lung injury is the cause of pulmonary fibrosis and pulmonary fibrosis contributes to morbidity and mortality is reviewed. Potential therapeutic strategies, including the use of mesenchymal stromal cells to enhance repair and restore physiologic function, are also reviewed. (Summary: M.J. Avram. Image: J.P. Rathmell.)



### 170 Endoluminal Computed Tomography: A Novel Technology for Assessment of Large Airway Pathologies (Images in Anesthesiology)

Laryngeal and tracheal pathologies may not be obvious during routine physical examination and usually warrant formal radiologic assessment to help the anesthesiologist choose the proper anesthetic induction and plan the maneuvers required to secure a definitive airway. Multidetector computerized tomography provides advanced reconstruction of large airways, including surface and three-dimensional volume-rendered endoluminal viewing. The usefulness of this virtual laryngo-tracheo-bronchoscopy is illustrated with images from a 55-yr-old patient with severe nondynamic tracheal stenosis scheduled for tracheal dilatation in which the tracheal stenosis through the vocal cords is clearly displayed. (Summary: M.J. Avram. Image: Endoluminal computed tomography of a patient with tracheal stenosis [reproduced from article in this issue of ANESTHESIOLOGY].)