

## 1201 Dose-dependent Association between Intermediate-acting Neuromuscular Blocking Agents and Postoperative Respiratory Complications

Perioperative use of neuromuscular blocking agents (NMBAs) is associated with postoperative respiratory complications. Records of 48,499 adult noncardiac surgery patients administered intermediate-acting NMBAs were reviewed to test the hypothesis that NMBAs are dose-dependently associated with an increased risk of postoperative respiratory complications. NMBA dose, categorized based on quintile distribution, was associated with risk of respiratory complications; the incidence of respiratory complications in the lowest dose quintile was 2.0% while that in the highest was 6.7%. Neostigmine doses larger than 60  $\mu\text{g/kg}$  increased risk of respiratory complications independent of NMBA effects. NMBA dose did not predict respiratory complications when neostigmine was administered at doses less than 60  $\mu\text{g/kg}$  after recovery of the second train-of-four twitch. See the accompanying Editorial View on [page 1183](#). (Summary: M.J. Avram. Illustration: J.P. Rathmell/A. Johnson, Vivo Visuals.)



## 1253 Effects of Morphine and Midazolam on Pharyngeal Function, Airway Protection, and Coordination of Breathing and Swallowing in Healthy Adults

The effects of sedative doses of morphine and midazolam on pharyngeal function and integration of breathing and swallowing, which are important for airway protection, were studied in 38 healthy young volunteers. Volunteers were randomly assigned to receive morphine (0.1 mg/kg) or midazolam (0.05 mg/kg) by intravenous infusion over 20 min, or no drug (control group). Sedative doses of morphine and midazolam caused pharyngeal dysfunction and affected coordination between breathing and swallowing, compromising airway protection and potentially increasing the risk of aspiration. These effects of morphine and midazolam were unrelated to the level of sedation. (Summary: M.J. Avram. Illustration: J.P. Rathmell.)



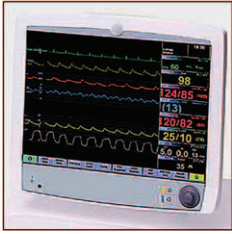
## 1224 Preexisting Cognitive Impairment Is Associated with Postoperative Cognitive Dysfunction after Hip Joint Replacement Surgery

Three hundred patients undergoing total hip replacement and 51 matched nonsurgical controls, all at least 60 yr old, were studied to identify the prevalence of preoperative cognitive impairment and its association with postoperative cognitive dysfunction 7 days and 3 months after surgery and cognitive decline 12 months after surgery. Preoperative cognitive impairment was identified in 32% of patients and was a predictor of postoperative cognitive dysfunction at 7 days and 3 months and cognitive decline at 12 months. Interestingly, there was no difference in the incidence of cognitive decline 12 months after surgery compared with the matched nonsurgical controls at the same time. (Summary: M.J. Avram. Image: J.P. Rathmell.)



## 1214 Intraoperative Tight Glucose Control Using Hyperinsulinemic Normoglycemia Increases Delirium after Cardiac Surgery

The causes of postoperative delirium may include the inflammatory response to surgery. Because hyperglycemia is both a response to inflammation and inflammatory and because insulin is antiinflammatory, the hypothesis that tight glucose control using a hyperinsulinemic-normoglycemic clamp approach will decrease the incidence of postoperative delirium was tested in 198 adults having cardiac surgery with cardiopulmonary bypass. Patients randomly assigned to tight intraoperative glucose control or standard therapy were considered to have experienced postoperative delirium when Confusion Assessment Method testing was positive at any assessment in five postoperative days. In contrast to the hypothesis, the incidence of delirium was 28% in the hyperinsulinemic-normoglycemic clamp group and 14% in the standard therapy group. See the accompanying Editorial View on [page 1186](#). (Summary: M.J. Avram. Illustration: J.P. Rathmell.)



## 1280 Comparison of Surgical Pleth Index–guided Analgesia with Conventional Analgesia Practices in Children: A Randomized Controlled Trial

The surgical pleth index (SPI) monitors surgical stress reactions and guides analgesic administration during anesthesia in adults using the pulse photoplethysmographic amplitude and heart rate data from pulse oximetry measurements. The hypothesis that SPI-guided analgesia would reduce intraoperative fentanyl administration in children was tested in 45 children undergoing adenotonsillectomy under general anesthesia randomly assigned to an SPI-guided analgesia group or a conventional analgesia group. Intraoperative fentanyl administration was guided using predefined criteria in both groups. SPI-guided analgesia reduced intraoperative fentanyl administration compared with conventional analgesia, but SPI-guided analgesia patients had higher emergence agitation scores and higher postoperative pain scores and required more rescue fentanyl. (Summary: M.J. Avram. Image: J.P. Rathmell.)



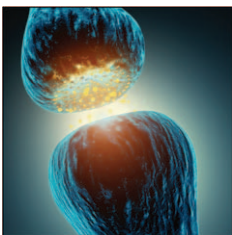
## 1377 Targeting p38 Mitogen-activated Protein Kinase to Reduce the Impact of Neonatal Microglial Priming on Incision-induced Hyperalgesia in the Adult Rat

Long-term alterations in injury response produced by neonatal hindpaw incision enhance spinal cord neuroglial signaling and increase hyperalgesia after adult incision. The phosphorylated form of mitogen-activated protein kinase p38 (p-p38) is linked to activation of transcription factors that upregulate synthesis and release of spinal microglia proinflammatory mediators. The hypothesis that priming of spinal microglial response by neonatal incision would increase adult incision-induced p-p38 expression was tested in young adult rats with or without prior neonatal incision. Functional microglial reactivity was enhanced in animals with prior neonatal incision, with an increased degree and more rapid onset of p-p38 expression in dorsal horn microglia. Intrathecal p38 inhibitor administration before incision prevented enhanced mechanical hyperalgesia in adults with prior neonatal injury. See the accompanying Editorial View on [page 1189](#). (Summary: M.J. Avram. Image: ©Thinkstock.)



## 1391 Surgical Injury in the Neonatal Rat Alters the Adult Pattern of Descending Modulation from the Rostroventral Medulla

Pain and injury during the neonatal period can alter normal development of sensory pathways, resulting in long-term changes in sensory thresholds and responses to future pain. The hypothesis that neonatal incision affects postnatal development of spinal modulation from the rostroventral medulla (RVM) was tested in young adult rats with or without prior neonatal incision. In animals with prior neonatal incision, spinal reflex excitability was inhibited by all intensities of RVM electrical stimulation, in contrast to the normal pattern of facilitation at low stimulation intensities and inhibition at high intensities. Generalized hypoalgesia appeared in ipsilateral and contralateral paws at 6 weeks of age. Altered reflex responses to RVM stimulation were prevented by sciatic nerve blockade at the time of neonatal incision. See the accompanying Editorial View on [page 1189](#). (Summary: M.J. Avram. Image: ©Thinkstock.)



## 1415 The Role of Dendritic Signaling in the Anesthetic Suppression of Consciousness (Review Article)

How anesthetics affect the brain to suppress consciousness is unclear. While signaling from higher-order association cortices to early sensory cortices (top-down processing) appears to dominate bottom-up processing in the awake state, this asymmetry disappears due to suppression of top-down processing upon loss of consciousness. The hypothesis that disruption of top-down signals by anesthetics occurs at the level of the apical dendrites of pyramidal neurons in the sensory cortices is developed. How this could lead to suppression of consciousness is explained in terms of disruption of the continuous evaluation process by which the brain compares its perceptual predictions with momentary sensory input because deviations from the predictions (bottom-up error signals) lose their meaning in the absence of predictions. See the accompanying Editorial View on [page 1196](#). (Summary: M.J. Avram. Image: ©Thinkstock.)