THIS MONTH IN

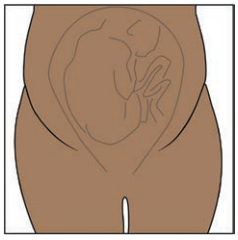
ANESTHESIOLOGY

614 Epidural Labor Analgesia—Fentanyl Dose and Breastfeeding Success: A Randomized Clinical Trial

High cumulative doses of epidural fentanyl administered for labor analgesia have been reported to be associated with early termination of breastfeeding. The hypothesis that breastfeeding success at 6 weeks postpartum is adversely influenced by the cumulative epidural fentanyl dose administered for labor analgesia was tested in a randomized controlled trial of 345 parous women who had successfully breastfed a previous infant for at least 6 weeks. Participants were randomly allocated to one of three study groups defined by the solution used to maintain epidural analgesia: bupivacaine 1 mg/ml without fentanyl, bupivacaine 0.8 mg/ml with fentanyl 1 μg/ml, and bupivacaine 0.625 mg/ml with fentanyl 2 μg/ml. At 6 weeks, 96.5% of the 312 women evaluated were still breastfeeding; there was no difference among the groups in the frequency of breastfeeding. *See the accompanying Editorial View on* **page 593**. *(Summary: M. J. Avram. Photo: ©ThinkStock. Illustration: A. Johnson, Vivo Visuals.)*

633 Perioperative Gabapentin Does Not Reduce Postoperative Delirium in Older Surgical Patients: A Randomized Clinical Trial

Postoperative pain and opioid use are associated with postoperative delirium. The hypothesis that rates of delirium could be reduced through intensive supplementary pain management with gabapentin in addition to standard opioid analgesics after surgery was tested in a randomized, placebo-controlled study of 697 patients. Patients were at least 65 yr old and undergoing spine surgery or joint replacement surgery. Gabapentin 900 mg or placebo was administered orally 1 to 2 h before anesthesia and surgery and continued for the first three postoperative days. Delirium was measured by the Confusion Assessment Method Rating Scale. The overall incidence (95% CI) of postoperative delirium in any of the first three postoperative days for the entire cohort was 22.4% (19.3 to 25.5%), and the incidence of delirium did not differ between the gabapentin group (24.0%) and the placebo group (20.8%). *(Summary: M. J. Avram. Image: ©ThinkStock.)*



625 Effect of Intrathecal Bupivacaine Dose on the Success of External Cephalic Version for Breech Presentation: A Prospective, Randomized, Blinded Clinical Trial

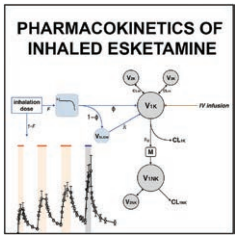
Meta-analysis of randomized controlled trials of the use of neuraxial anesthetic blockade for external cephalic version suggested that administering higher doses of local anesthetic with resultant denser blockade leads to increased external cephalic version success, although best practice has not been defined. The hypothesis that increased intrathecal bupivacaine dose, administered as part of a combined spinal-epidural anesthetic technique, would be associated with increased external cephalic version success was tested in 239 patients randomly assigned to one of four intrathecal bupivacaine dosing groups (2.5, 5, 7.5, and 10 mg). The external cephalic version success rate observed for patients in this trial was 51.5%; there were no differences in external cephalic version success rates among the four bupivacaine dose groups. The cesarean delivery rate was 57.7% and was not different among groups. *See the accompanying Editorial View on* **page 596**. *(Summary: M. J. Avram. Illustration: J. P. Rathmell.)*

666 Combined Thoracic Ultrasound Assessment during a Successful Weaning Trial Predicts Postextubation Distress

Unnecessary extubation delays can increase the morbidity and mortality associated with prolonged ventilation. This prospective observational study of 136 mechanically ventilated patients considered to be ready for extubation tested the hypothesis that use of an integrated thoracic ultrasound assessment, including bedside respiratory, cardiac, and diaphragm sonographic data, could accurately predict postextubation distress in patients who passed a pressure support ventilation trial. Thirty-one of the 136 patients studied developed postextubation distress within 48 h. Integrated thoracic ultrasound models applied to thoracic ultrasound data recorded immediately before and after the trial of pressure support ventilation accurately predicted postextubation distress; the areas under the receiver-operating characteristic curves were greater than 0.90. Recognition of lung interstitial edema and increased diastolic left ventricular pressure were the factors most relevant to predicting successful extubation. Thoracic ultrasound also accurately identified causes of respiratory failure in case of postextubation distress. *See the accompanying Editorial View on* **page 599**. *(Summary: M. J. Avram. Image: J. P. Rathmell.)*

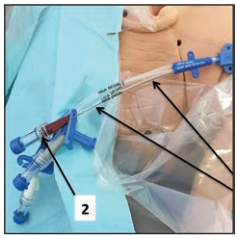
684 Recovery after Nulliparous Birth: A Detailed Analysis of Pain Analgesia and Recovery of Function

There is little granular data on the pain experience, analgesic requirements, and functional recovery during the postpartum period. This observational cohort study determined the time required to reach the composite outcome variable of pain and opioid-free functional recovery after vaginal delivery or cesarean delivery in 213 healthy, first-time mothers. Median times (interquartile range) to the primary endpoint in 99 vaginal delivery patients and 35 cesarean delivery patients were 19 (11 to 26) and 27 (19 to 40) days, respectively. Median times (interquartile range) to opioid cessation, analgesic cessation, and pain resolution after vaginal delivery were 0 (0 to 2), 11 (5 to 17), and 14 (7 to 24) days, respectively, while those after cesarean delivery were 9 (5 to 12), 16 (11 to 24), and 21 (14 to 27) days, respectively. There was significant interpatient variability in these times after both vaginal delivery and cesarean delivery. *(Summary: M. J. Avram. Image: J. P. Rathmell.)*



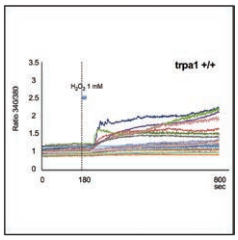
675 Pharmacokinetics and Bioavailability of Inhaled Esketamine in Healthy Volunteers

Ketamine is usually administered intravenously or intramuscularly. Inhalation of preservative-free esketamine through a nebulizer system by spontaneously breathing subjects delivered a potentially active dose rapidly, with few serious adverse effects. Three increasing doses of nebulized esketamine followed by a single intravenous dose were administered to 19 healthy volunteers, with at least 60 min between inhalations and between the last inhalation and the intravenous infusion. Arterial blood samples were obtained at regular intervals for measurement of plasma esketamine concentrations, which were used to develop a pharmacokinetic model using population nonlinear mixed effect analysis. A simple compartmental pharmacokinetic model characterized the disposition of both inhaled and intravenous esketamine. There were two distinct pulmonary absorption pathways: a rapid one and one from which ketamine was released slowly. Inhaled ketamine bioavailability was reduced due to both dose-independent and dose-dependent impairment of pulmonary uptake. *(Summary: M. J. Avram. Image: From original article.)*



658 Preventing Retained Central Venous Catheter Guidewires: A Randomized Controlled Simulation Study Using a Human Factors Approach

A retained central venous catheter guidewire is a never event. Current preventative solutions depend on the operator remembering to remove the guidewire. Using human factors engineering principles, a safety intervention was designed that consists of a novel locked procedure pack that acts to ensure the operator always removes the guidewire. Twenty physicians capable of independent central catheter insertion participated in a randomized, controlled, forced-error simulation study that replicated catheter insertion and forced a retained guidewire event, comparing standard practice to the locked pack. Eight of ten standard group members failed to recognize the guidewire in the catheter lumen, secured the central venous catheter, applied the dressings, and were satisfied that they had completed the procedure correctly. All ten locked pack group members removed the guidewire, used it to open the locking mechanism of the procedure pack, and finished the procedure. *(Summary: M. J. Avram. Image: From original article.)*



695 Hydrogen Peroxide Induces Muscle Nociception *via* Transient Receptor Potential Ankyrin 1 Receptors

The transient receptor potential ankyrin 1 (TRPA1) channel is activated by noxious cold, reactive oxygen species, and mechanical stimuli. Hydrogen peroxide (H_2O_2) is the major reactive oxygen species and is an early signal of incision tissue injury. Because the TRPA1 antagonist HC-030031 affected nociceptive behaviors caused by deep muscle incision, the hypothesis that H_2O_2 exerts nociceptive effects in muscle tissue was tested in a detailed evaluation of the actions of H_2O_2 on nociception of deep muscle tissue in rats and mice. Intramuscular injection of H_2O_2 produced nociceptive and aversive behaviors *via* the TRPA1 receptor, caused sustained activity of dorsal horn neurons, and activated a subset of lumbar dorsal root ganglia neurons that also responded to allyl isothiocyanate, a TRPA1 agonist, and to capsaicin, a transient receptor potential vanilloid 1 agonist. The actions of intramuscular H_2O_2 were confirmed in TRPA1 knockout mice. *(Summary: M. J. Avram. Image: From original article.)*