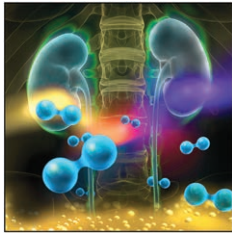


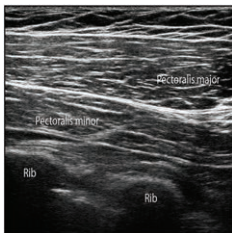
THIS MONTH IN ANESTHESIOLOGY



406 Noninvasive Urine Oxygen Monitoring and the Risk of Acute Kidney Injury in Cardiac Surgery

Decreased oxygen delivery and renal hypoxia contribute to acute kidney injury (AKI) after cardiac surgery. The outer medulla of the kidney is most susceptible to hypoxic injury. When urine is first excreted, its oxygen partial pressure is similar to that of the renal medulla. The hypothesis that continuous intraoperative urine oxygen partial pressure measurement with a urinary oximeter placed between the urinary catheter and collection bag is feasible and that low urine oxygen partial pressure is associated with subsequent development of AKI was tested in 91 cardiac surgery patients undergoing procedures requiring cardiopulmonary bypass. Continuous urine oxygen partial pressure measurement was feasible in 86 of 91 (95%) patients, 53 (62%) of whom developed

AKI. During the cardiopulmonary bypass period there was no difference in mean urine oxygen partial pressure between patients who subsequently developed AKI and those who did not. However, during the postcardiopulmonary bypass period a cutoff of mean urine oxygen partial pressure less than 25 mmHg was associated with AKI. See the accompanying Editorial on [page 380](#). (Summary: M. J. Avram. Image: A. Johnson, Vivo Visuals.)



442 Pectoral Nerve Blocks for Breast Augmentation Surgery: A Randomized, Double-blind, Dual-centered Controlled Trial

Insertion of breast prosthesis in breast augmentation surgery causes major postoperative pain. Multimodal analgesia and local anesthetic infiltration are reported to reduce pain and/or opioid use after breast augmentation. Pectoral nerve blocks have been proposed for analgesia during and after breast surgery. The hypothesis that adding preincisional pectoral nerve blocks to a systematic nonopioid multimodal analgesic regimen is superior to the multimodal analgesic regimen alone for pain control after breast augmentation surgery was tested in a randomized controlled trial of 73 patients undergoing the surgery under general anesthesia. The mean \pm SD maximal numeric rating scale (from 0 to 10) score in the first 6 h after extubation (the primary outcome) in the

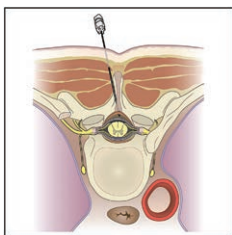
pectoral nerve blocks group, 3.9 ± 2.5 , was less than that in the control group, 5.2 ± 2.2 ; the difference (95% CI) in scores between the groups was -1.2 (-2.3 to -0.1). Rescue opioid consumption (oral morphine equivalents) was less in the pectoral nerve blocks group from the sixth hour to day 1 and from day 1 to day 5. (Summary: M. J. Avram. Image: J. Zeballos/K. Vlassakoff, Brigham and Women's Hospital.)



433 Anterior Quadratus Lumborum Block Does Not Provide Superior Pain Control after Hip Arthroscopy: A Double-blinded Randomized Controlled Trial

Hip arthroscopy is associated with moderate to severe pain. The anterior quadratus lumborum block provides analgesia to both the lower extremities and the trunk. The hypothesis that addition of anterior quadratus lumborum block to a multimodal analgesia including opioids would be associated with superior postoperative pain control was tested in a randomized controlled trial of 96 patients undergoing ambulatory hip arthroscopy. All patients received neuraxial anesthesia with deep sedation and multimodal analgesia intraoperatively. Postoperative pain medications included oxycodone with intravenous hydromorphone for breakthrough

pain in the postanesthesia care unit, and patients were prescribed oxycodone/oxycodone with acetaminophen and an oral nonsteroidal anti-inflammatory drug. The primary outcomes, numeric rating scale (from 0 to 10) pain scores at rest and with movement at 30 min and 1, 2, 3, and 24 h after postanesthesia care unit arrival, did not differ between groups; treatment differences (no block group – block group) in overall treatment effect (95% CI) were 0.7 (-0.1 to 1.5) for pain at rest and 0.4 (-0.6 to 1.3) for pain with movement. (Summary: M. J. Avram. Image: J. P. Rathmell.)



419 Epidural Anesthesia–Analgesia and Recurrence-free Survival after Lung Cancer Surgery: A Randomized Trial

Epidural anesthesia and analgesia blunts the stress response and inflammation induced by surgery and decreases the need for volatile anesthetics and opioids. The hypothesis that combining epidural–general anesthesia with epidural analgesia improves recurrence-free survival compared to general anesthesia alone with intravenous analgesia was tested in a randomized controlled trial of 400 patients having potentially curative lung cancer surgery, 84% (336 of 400) of whom had histologically confirmed lung cancer. Patients randomized to combined epidural–general anesthesia required 46% less intraoperative opioid; total perioperative opioid consumption (intravenous morphine equivalents) was only 8% less in the epidural–general anesthesia group because the

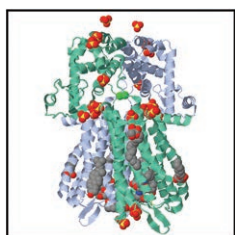
postoperative epidural infusion included sufentanil. During a median (interquartile range) 32 (24 to 48) months follow-up period, there were 54 events (recurrence or death) among the 200 patients (27%) randomized to general anesthesia alone and 48 events in the 200 patients (24%) randomized to combined epidural–general anesthesia, for an adjusted hazard ratio (95% CI) of 0.90 (0.60 to 1.35). (Summary: M. J. Avram. Image: G. Nelson/J. P. Rathmell.)



454 Peripheral Nerve Blocks and Potentially Attributable Adverse Events in Older People with Hip Fracture: A Retrospective Population-based Cohort Study

Systematic reviews suggest peripheral nerve blocks for hip fractures reduce pain and opioid consumption, improve mobility, and decrease pulmonary complications. However, nerve blocks have associated risks, especially in hip fracture patients who have many risk factors for nerve injury and systemic local anesthetic toxicity. The hypothesis that hip fracture patients who received a nerve block, including those treated operatively and nonoperatively, would not be at greater risk of potentially nerve block-attributable adverse events was tested in a population-based cohort study of 91,563 patients who presented to hospital between

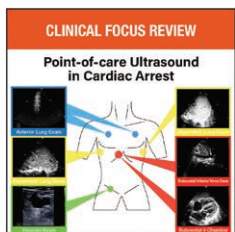
2009 and 2017 with a hip fracture, 15,631 (17.1%) of whom received a peripheral nerve block. In patients with a nerve block, 866 of 15,631 (5.5%) had a potentially nerve block-attributable safety event (cardiac arrest, seizure, fall-related injury, or nerve injury) compared to 4,455 of 75,932 (5.9%) of those without a block. After multilevel, multivariable adjustment there was no association between potentially nerve block-attributable safety events and nerve block receipt; the adjusted odds ratio (95% CI) was 1.05 (0.97 to 1.15). (Summary: M. J. Avram. Image: J. P. Rathmell.)



482 Functional Profile of Systemic and Intrathecal Cebranopadol in Nonhuman Primates

Coactivation of nociceptin and μ -opioid receptors may provide synergistic analgesic effects and simultaneously counteract μ -receptor-mediated side effects, including respiratory depression, pruritus, and abuse liability. Cebranopadol is an agonist at both the μ -opioid receptor and the nociceptin/opioid receptor. The hypothesis that coactivation of nociceptin receptors and μ -opioid receptors produces analgesia with reduced side effects was tested in nonhuman primate models by comparing the functional profiles of cebranopadol after systemic and intrathecal administration with those of the μ receptor agonists fentanyl and morphine.

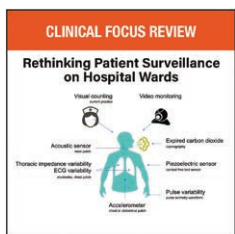
Systemic cebranopadol produced full antinociception (median effective dose, 2.9 μ g/kg) in an acute thermal nociception assay, which was mediated mainly by μ receptors. It did not compromise respiratory functions at a dose 10 times its analgesic median effective dose. No pruritic effect was observed after either systemic or intrathecal administration of cebranopadol. Although cebranopadol retained a certain degree of reinforcing effects and strength, these were less than those of fentanyl. See the accompanying Editorial on [page 382](#). (Summary: M. J. Avram. Image: μ -opioid receptor, Jmol: an open-source Java viewer for chemical structures in 3D. <http://www.jmol.org/>)



508 Point-of-care Ultrasound in Cardiac Arrest (Clinical Focus Review)

Point-of-care ultrasound is a qualitative surface examination of various anatomical locations to screen for a limited number of gross pathologies as indicated by the clinical scenario and as an extension of the physical examination. Point-of-care ultrasound is a valuable tool for confirming cardiac arrest rhythm classification, detecting preserved cardiac activity, and narrowing the differential diagnosis for reversible causes of cardiac arrest so appropriate therapies can be initiated. Ultrasound examinations should be performed for patients with significant hemodynamic instability of unclear etiology in the postanesthesia care unit and intensive care unit to identify interventions that may prevent further decompensation. It is imperative that the ultrasound examination complement, and not interfere with, standard advanced cardiac life support (ACLS).

Although it is best to have the most experienced clinician acquire images during ACLS, interpreting them does not require significant expertise. Transesophageal echocardiography may be a useful addition to, but not replacement for, surface ultrasound during cardiac arrest. (Summary: M. J. Avram. Image: From original article.)



531 Rethinking Patient Surveillance on Hospital Wards (Clinical Focus Review)

Patient vital sign abnormalities that typically precede severe adverse events can be missed on hospital wards because of a low nurse-to-patient ratio and the intermittent nature of patient monitoring. This may be prevented by continuous monitoring of vital signs, including heart rate and electrocardiography, blood pressure, oxygen saturation, and respiratory rate. Continuous monitoring of vital signs would give the opportunity to frequently refresh early warning scores based on the aggregation of several vital signs into a single variable in the electronic medical record. Effective continuous monitoring requires a system able to centralize the information and to alert nurses on their pagers or cell phones as soon as patients deteriorate. To be effective, the early detection

of clinical deterioration must be followed by an early and appropriate intervention. The ward patients most likely to benefit from continuous monitoring include those at high risk of postoperative complications, who could be identified preoperatively using the surgical risk calculator from the American College of Surgeons or scores predicting postoperative morbidity. (Summary: M. J. Avram. Image: From original article.)