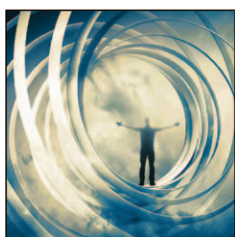


### 985 Prediction of Movement to Surgical Stimulation by the Pupillary Dilatation Reflex Amplitude Evoked by a Standardized Noxious Test

The likelihood of response to noxious stimulation during surgery under total intravenous anesthesia can be predicted using pharmacokinetic-pharmacodynamic models. Alternatively, the balance between nociception and antinociception can be assessed in anesthetized patients by determining the amplitude of a physiologic reflex evoked by a standardized noxious test. Seventy-six women scheduled for an operative procedure requiring cervical dilation were anesthetized with a target propofol effect site concentration of 4  $\mu\text{g/ml}$  and a randomly assigned remifentanyl effect site concentration of 0, 1, 3, or 5  $\text{ng/ml}$ . Pupillary dilatation reflex amplitude in response to a standardized noxious test predicted movement response upon cervical dilation as accurately as the estimated remifentanyl effect site concentration. See the accompanying Editorial View on [page 961](#). (Summary: M.J. Avram. Photo illustration: J.P. Rathmell/A. Johnson, Vivo Visuals.)



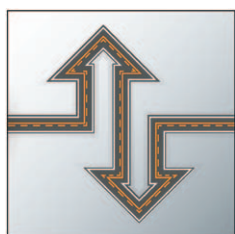
### 1103 Fibromyalgia Survey Criteria Are Associated with Increased Postoperative Opioid Consumption in Women Undergoing Hysterectomy

Fibromyalgia is a pain disorder that is associated with aberrant central pain processing, which may affect opioid effectiveness. Fibromyalgia Survey criteria independently predicted increased opioid consumption after total hip and knee arthroplasty, even after controlling for other predictors. The hypothesis that Fibromyalgia Survey scores would predict postoperative opioid consumption after hysterectomy was tested to determine the generalizability of this finding. One hundred ninety-five patients scheduled for hysterectomy for a benign indication completed preoperative phenotyping using validated self-report measures. Postoperative opioid consumption was positively associated with the continuous Fibromyalgia Survey score in a multivariate linear regression model. Additional predictors of increased postoperative opioid consumption include higher American Society of Anesthesiologists class, catastrophizing, laparotomy surgical approach, and preoperative opioid use. See the accompanying Editorial View on [page 967](#). (Summary: M.J. Avram. Image: ©Thinkstock.)



### 974 Safeguards to Prevent Neurologic Complications after Epidural Steroid Injections: Consensus Opinions from a Multidisciplinary Working Group and National Organizations (Special Article)

An expert multidisciplinary working group reviewed scientific evidence and assembled consensus clinical considerations aimed at reducing the risk of rare catastrophic neurologic injuries associated with epidural corticosteroid injections for treatment of radicular pain. Laboratory and animal studies suggest intraarterial injection of particulate steroids is a likely mechanism of spinal or cerebrovascular complications of cervical transforaminal injections. Other potential mechanisms of injury include perforation and traumatic aneurysm of the vertebral artery caused by needle penetration. The working group approved the clinical consideration that only nonparticulate steroids should be used in therapeutic cervical transforaminal injections and recommended image guidance for all cervical interlaminar injections. Other specific clinical considerations for performing transforaminal and interlaminar injections are given. See the accompanying Editorial View on [page 964](#). (Summary: M.J. Avram. Image: J.P. Rathmell.)



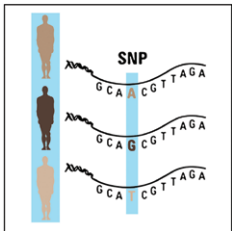
### 1112 Intraoperative Methadone for the Prevention of Postoperative Pain: A Randomized, Double-blinded Clinical Trial in Cardiac Surgical Patients

Cardiac surgery patients report pain of moderate to severe intensity during intensive care unit admission despite treatment with potent opioids. To test the hypothesis that patients administered intraoperative methadone would have decreased morphine requirements and improved pain scores after cardiac surgery, 156 patients were randomized to receive 0.3  $\text{mg/kg}$  methadone or 12  $\mu\text{g/kg}$  fentanyl, half of which was administered at induction of anesthesia and half was infused over the next 2 h. Morphine requirements in the methadone group were reduced by 40% during the first 24 h after tracheal extubation while postoperative pain severity was decreased by 30 to 40% and patient-perceived quality of pain management was enhanced during the first three postoperative days. See the accompanying Editorial View on [page 969](#). (Summary: M.J. Avram. Image: ©Thinkstock.)



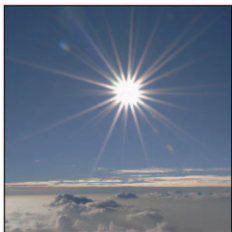
### 1154 Practice Improvements Based on Participation in Simulation for the Maintenance of Certification in Anesthesiology Program (Original Investigations in Education)

High-fidelity, mannequin-based simulation experiences to satisfy the American Board of Anesthesiology requirements for the Maintenance of Certification in Anesthesiology Program (MOCA) began in 2010. Participants are required to propose practice improvement changes prompted by course participation and to report the status of their improvement goals within 90 days. A stratified sample of 3 yr of participants' practice improvement plans was analyzed. Of 1,982 plans, 79% were fully completed, 16% were partially completed, and 6% were not completed within the 90-day reporting period. Ninety-four percent of anesthesiologists reported implementing at least one improvement within 3 months of participating in a MOCA simulation course. Plans that targeted inter-professional team members had a higher likelihood of completion. (Summary: M.J. Avram. Photo: J.P. Rathmell.)



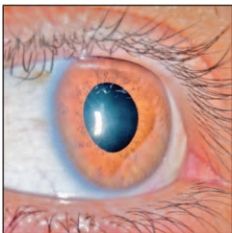
### 1123 Genetic and Clinical Factors Associated with Chronic Postsurgical Pain after Hernia Repair, Hysterectomy, and Thoracotomy: A Two-year Multi-center Cohort Study

The relationships of functional genetic polymorphisms and clinical factors to risk of chronic postsurgical pain (CPSP) 4 months after inguinal hernia repair, hysterectomy, or thoracotomy were assessed in a prospective multicenter cohort study. Within a median of 4.4 months, CPSP developed in 527 of 2,929 patients. There were no significant differences in 90 single nucleotide polymorphisms between 502 patients with confirmed CPSP and 503 control patients without CPSP matched to cases by age, surgery, sex, place of origin, and hospital recruitment. A six-variable generalized linear mixed model identified more than 73% of the patients who developed CPSP. Clinical predictors were surgical procedure, age, physical health, mental health, and preoperative pain in the surgical field and in another area. (Summary: M.J. Avram. Illustration: J.P. Rathmell.)



### 1170 Health Implications of Disrupted Circadian Rhythms and the Potential for Daylight as Therapy (Clinical Concepts and Commentary)

The molecular basis of the circadian rhythm involves a complex transcriptional-translational feedback loop that takes approximately 24 h to complete. External stimuli change circadian protein expression profiles to synchronize the endogenous circadian rhythm to the environment. The most powerful external stimulus in humans is daylight, exposure to which leads to induction of Period protein transcription. Period proteins belong to the PAS domain superfamily, which are sensors of oxygen or light, and are involved in regulation of metabolism and sleep. Disrupted circadian rhythms are connected to clinical disorders, including metabolic syndrome and obesity, premature aging, diabetes, cardiac arrhythmias, immune deficiencies, hypertension, and abnormal sleep cycles. Because daylight entrains and resynchronizes circadian rhythms, exposure to naturally cycled daylight may prevent or treat circadian-related illnesses. (Summary: M.J. Avram. Photo: J.P. Rathmell.)



### 994 Corneal Abrasion in Hysterectomy and Prostatectomy: The Role of Laparoscopic and Robotic Assistance

Corneal abrasion (CA) has been targeted for anesthesia performance improvement as potentially preventable. Using the Nationwide Inpatient Sample, the incidence of CA after prostatectomies and hysterectomies was determined to test the hypothesis that laparoscopic or robot assistance increases risk. CAs among radical prostatectomy discharges increased from fewer than 10 in 2000 to 46 in 2011. Those among laparoscopic hysterectomy discharges increased from fewer than 10 in 2000 to 55 in 2011. The rate of CA in open hysterectomy was 0.03% during 2000–2011. In 2009 to 2011, there was an approximately four-times higher risk of CA when laparoscopy was used for hysterectomy, and a seven-times higher risk when laparoscopic hysterectomy was robotically assisted, compared with an open procedure. (Summary: M.J. Avram. Photo: J.P. Rathmell.)