

ANESTHESIOLOGY

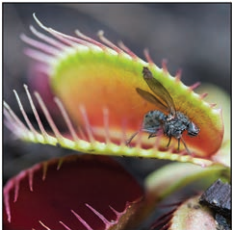


Deborah J. Culley, M.D., Editor


Surgical interventions for the treatment of painful neuroma: A comparative meta-analysis. Pain 2017 Nov 20 [Epub ahead of print].

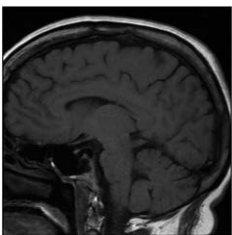
Neuromas resulting from trauma and surgery can be the source of intense refractory pain. Postsurgical neuromas are believed to be an important source of chronic postoperative pain. Many approaches to treatment have been suggested, but there is no consensus on the optimal methods. In a recent meta-analysis involving 54 studies and 1,381 patients, the authors attempted to compare several surgical procedures to reduce neuroma-related pain. Although the quality of individual studies was deemed to be low, the overall risk of publication bias was found to be minimal. The authors concluded that surgical treatment was effective in 77% of patients, although overall differences between surgical techniques were not identified. For patients with symptoms greater than 2 yr in duration, excision and transposition or neurolysis and coverage were found to be the better surgical options. The authors also concluded that future studies should directly compare specific surgical treatments and better account for confounding variables. (Summary: Deborah J. Culley. Image: ©ThinkStock.)

Take home message: Postsurgical neuromas may be an important source of chronic postoperative pain that may be treated surgically.


Anesthetics stop diverse plant organ movements, affect endocytic vesicle recycling and ROS homeostasis, and block action potentials in Venus flytraps. Ann Bot 2017 Dec 11 [Epub ahead of print].

A variety of botanical observations dating back to the work of Claude Bernard in 1878 demonstrate sensitivity of plants to diethyl ether and more modern anesthetics. This study evaluated the effects of 15% diethyl ether, 1% lidocaine or 80% xenon in 20% oxygen on plant movement, action potentials, seed germination, chlorophyll accumulation, reactive oxygen species, and endocytic vesicle recycling in sensitive plants, Venus flytrap, Cape sundew, pea, garden cress plants, and in Arabidopsis seeds. They used photography to follow plant movements, confocal microscopy to analyze endocytic vesicle trafficking, and a surface silver chloride electrode to measure action potentials. Plant movement was abolished by diethyl ether with recovery after several hours in all plants and was associated with loss of action potentials in trigger hairs of the Venus flytrap. Histochemical staining revealed exaggerated production of reactive oxygen species in Arabidopsis root apex with diethyl ether and in maize root apices with lidocaine and xenon. Seeds of garden cress failed to break dormancy under all anesthetic treatments. Diethyl ether and lidocaine slowed the rate of endocytic vesicle recycling in Arabidopsis root cells. (Summary: Martin J. London. Image: ©ThinkStock.)

Take home message: Plants demonstrate physiologic sensitivity to several anesthetics tested in a manner similar to humans and animals. They may have potential as suitable test systems for human anesthesia.


CSF beta-amyloid 1–42 concentration predicts delirium following elective arthroplasty surgery in an observational cohort study. Ann Surg 2018 Feb 2 [Epub ahead of print].

Postoperative delirium is common in older surgical patients and there is significant interest in identifying biomarkers that are predictive of its development. This observational cohort study evaluated 282 patients, 65 yr of age and older, undergoing elective knee or hip arthroplasty under spinal anesthesia for biomarkers predictive of postoperative delirium. Among the multiple variables evaluated, binary logistic regression analysis identified that the odds ratio for the development of postoperative delirium based on the confusion assessment method or chart review was by 1.1 for each year of age, 1.8 for each class increase on the Charlson Comorbidity Index, and 2.9 if intravenous opioids were used. Interestingly, the odds ratio for the development of postoperative delirium was decreased to 0.4 among patients undergoing hip surgery and by 0.996 for each unit (ng/l) increase in cerebral spinal fluid amyloid beta 42. This study suggests that low preoperative levels of cerebral spinal fluid amyloid beta 42 may serve as a potential biomarker for the development of postoperative delirium. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Cerebral spinal fluid amyloid beta 42 levels may help predict the development of postoperative delirium.



An educational intervention decreases opioid prescribing after general surgical operations. *Ann Surg* 2018; 267:468–72.

Opioid over-prescribing is believed to have contributed to the opioid epidemic in the United States. This study describes an educational intervention that involved sharing information about the variability and over-prescription of opioids in the department of surgery. This information was shared with the department during grand rounds and it was suggested that nonopioid alternatives such as acetaminophen or nonsteroidal antiinflammatory agents should be considered before the administration of opioids. The authors compared preintervention opioid practices to post-intervention opioid-prescribing practices and identified that this simple intervention led to a marked decrease in the number of opioid pills prescribed regardless of the type of surgery ($P < 0.001$). The authors note that despite a 43 to 74% decrease in the number of opioids prescribed, only one patient required a prescription refill within 30 days after

surgery, while the majority of the patients took between 19 and 50% of their prescribed pills, suggesting that even this reduced level of opioid prescribing was associated with opioid over-prescription. (Summary: Deborah J. Culley. Image: ©ThinkStock.)

Take home message: A simple intervention involving identification of opioid prescribing practices and a suggestion to use alternatives to opioids can lead to a decrease in the number of postoperative opioids prescribed.

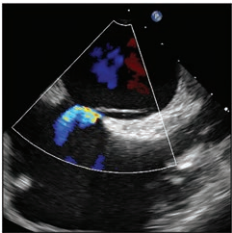


Adjunctive glucocorticoid therapy in patients with septic shock. *N Engl J Med* 2018; 378:797–808.

The efficacy and safety of adjunctive glucocorticoid therapy in sepsis remains controversial. This double-blind randomized controlled trial was conducted in 69 intensive care units in five countries (primarily Australia) in adults undergoing mechanical ventilation with suspicion of infection being treated with vasopressors or inotropic agents for at least 4 h before randomization. Subjects received a continuous infusion of 200mg hydrocortisone ($n = 1,832$) or placebo ($n = 1,826$) daily for up to 7 days or until intensive care unit discharge or death. The primary outcome was all-cause mortality at 90 days. There were no significant differences in the primary outcome of all-cause mortality at 90 days; 27.9% versus 28.2% in hydrocortisone and placebo groups, respectively (odds ratio, 0.95; 95% CI, 0.82 to 1.10; $P = 0.50$). Among the secondary outcomes, time to resolution of shock 3 days (interquartile range, 2 to 5 days) versus 4

days (interquartile range, 2 to 9 days; $P < 0.001$) and blood transfusions were significantly lower in treated patients (37.0% vs. 41.7%, $P = 0.004$). (Summary: Martin J. London. Image: J. P. Rathmell.)

Take home message: In patients requiring mechanical ventilation for septic shock, a continuous infusion of hydrocortisone for 7 days did not result in lower 90-day mortality rates.

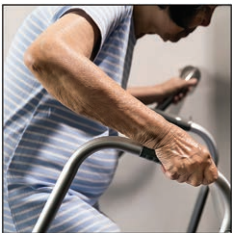


Association of preoperatively diagnosed patent foramen ovale with perioperative ischemic stroke. *JAMA* 2018; 319:452–62.

More than one quarter of the general population has a patent foramen ovale at autopsy; the majority of these are undiagnosed. It is unclear whether the presence of a patent foramen ovale increases the risk of perioperative ischemic stroke. This study presents data from three hospitals involving 150,198 patients. Among these, 1% had a diagnosed patent foramen ovale before surgery. Patients with a patent foramen ovale had an odds ratio for perioperative ischemic stroke of 2.66 when compared to patients without one (95% CI, 1.96 to 3.63; $P < 0.001$). Patients with a patent foramen ovale also had a 3.14 increase in relative risk for large vessel territory stroke (95% CI, 2.21 to 4.48; $P < 0.001$) and greater neurologic deficits ($P = 0.02$). These data suggest that patients with a documented patent foramen ovale

may be at increased risk for perioperative when compared to patients without a patent foramen ovale. (Summary: Deborah J. Culley. Image: S. Sherman, Brigham Health Care.)

Take home message: Patients with a preoperatively diagnosed patent foramen ovale may be at increased risk of perioperative ischemic stroke.

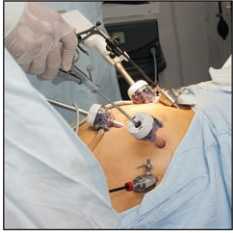


New 5-factor modified frailty index using American College of Surgeons NSQIP data. *J Am Coll Surg* 2018; 226:173–81.e8.

The American College of Surgeons National Surgical Quality Improvement Program has previously developed an 11-factor frailty index (mFI-11) that is a predictor of postoperative morbidity and mortality. With time, a number of these factors have been removed as they failed to have predictive power. Currently there are five predictors of frailty that remain in the database. The purpose of this study was to correlate the predictive power of the current 5-factor (mFI-5) when compared to the original 11-factor frailty index with regards to the ability to predict adverse outcomes associated with frailty in 541,485 patients in the 2012 database. The odds ratio for predicting mortality using the 5-point scale was 4.1 (95% CI, 3.5 to 4.8) and 3.3 (95% CI, 2.9 to 3.8) with the 11-point scale. Interestingly, the odds ratio for postoperative complications according to the 5-point scale was 3.1 (95% CI, 2.9 to 3.2) and 2.6 (95% CI, 2.5 to 2.8) for the 11-point scale; unplanned 30-day readmission had an odds ratio of 4.3 (95% CI, 4 to 4.6) for the 5-point scale and 3.4 (95% CI, 3.2 to 3.7) for the 11-point scale. The majority of the adjusted C-statistics were above 0.7, suggesting good correlation between the two. (Summary: Deborah J. Culley. Image: ©ThinkStock.)

Take home message: The new 5-point American College of Surgeons National Surgical Quality Improvement Program frailty index correlates well with the previous 11-factor frailty index.

Key Papers from the Most Recent Literature Relevant to Anesthesiologists



Same-day discharge after laparoscopic Roux-en-Y gastric bypass: An analysis of the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database. J Am Coll Surg 2018 Feb 8 [Epub ahead of print].

The safety of same-day surgery in obese patients undergoing laparoscopic Roux-en-Y gastric bypass is unknown. This study used the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database to compare outcomes between 319 patients who were discharged on the day of surgery to 9,402 patients who were discharged on postoperative day 1. On univariate analysis, there was an increased mortality among patients having same-day discharge when compared to those discharged on postoperative day 1 ($P = 0.002$), but this was not included in the multivariate model due to the small number of patients involved. On multivariate analysis, patients hav-

ing Roux-en-Y gastric bypass and discharged on the day of surgery had a higher overall morbidity (adjusted odds ratio, 2.4; 95% CI, 1.4 to 4.7; $P = 0.02$), but there were no differences in reoperations or readmission rates between the two groups. Discharge on the day of a laparoscopic Roux-en-Y gastric bypass may increase morbidity and mortality when compared to discharge on postoperative day 1. (Summary: Deborah J. Culley. Image: ©ThinkStock.)

Take home message: Same-day discharge after Roux-en-Y gastric bypass may increase morbidity and mortality.



Effect of general anesthesia and conscious sedation during endovascular therapy on infarct growth and clinical outcomes in acute ischemic stroke: A randomized clinical trial. JAMA Neurol 2018 Jan 16 [Epub ahead of print].

It remains unclear whether general anesthesia or conscious sedation is associated with better outcomes in patients undergoing intra-arterial therapy for the treatment of stroke. The General or Local Anesthesia in Intra Arterial Therapy study describes a single-center, prospective randomized controlled trial evaluating the effect of general anesthesia or conscious sedation on outcomes in patients with acute ischemic stroke. The primary endpoint was infarct growth between magnetic resonance imaging scans performed before endovascular therapy and 48 to 72h after endovascular therapy. A total of 128 patients were enrolled in the trial; they had a mean age of 71 yr. The authors identified no

significant difference in the primary outcome of change in mean infarct growth between patients treated with general anesthesia 8ml (interquartile range, 2 to 39ml) and patients treated with conscious sedation 19ml (interquartile range, 2 to 79ml; $P = 0.10$). There was no difference in neurologic outcomes 24h after stroke ($P = 0.11$), but there was a better odds ratio for improved modified Rankin scores 90 days after stroke with general anesthesia (1.9; 95% CI, 1.0 to 3.6), which was a secondary outcome in this study. (Summary: Martin J. London. Image: J. P. Rathmell.)

Take home message: The use of general anesthesia for the endovascular treatment of stroke may not result in worse stroke volumes or long-term clinical outcomes when compared to conscious sedation.

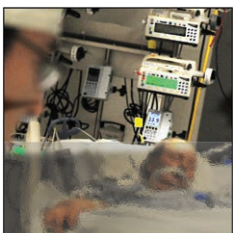


The business case for investing in physician well-being. JAMA Intern Med 2017; 177:1826–32.

Physician burnout is prevalent and has significant consequences for doctors and their patients. Burnout has been linked to physical and mental illness in physicians and reduced quality and safety of patient care. This review describes the significant financial consequences of burnout on medical centers. Physician burnout predicts turnover and lower productivity, and it adds significant expense for healthcare systems because of need to recruit, lost revenue, and increased costs of patient care as the replacement cost for a physician is approximately two to three times their salary. Organizations can reduce burnout if they understand the cause (workload, efficiency, flexibility and/or control, culture and values, work-life integration, community at work, and meaning in work) and if they are willing to make a commitment to change. This commitment requires shifting culture and requires time and money. The authors provide financial

worksheets to determine the cost of burnout and return on investment from interventions that include a financial argument to support investments to reduce physician burnout. (Summary: Franklyn Cladis. Image: ©ThinkStock.)

Take home message: While there are strong moral and ethical arguments for addressing physician burnout, there may be important financial ones as well.



Acute physiologic stress and subsequent anxiety among family members of ICU patients. Crit Care Med 2018; 46:229–35.

Family member experience in an intensive care unit has been associated with psychologic morbidity. This prospective cohort study investigated whether salivary cortisol levels among family members of patients requiring care in an intensive care unit with an Acute Physiology and Chronic Health Evaluation (APACHE) score of 16 or higher was associated with subsequent psychologic distress in 100 family members of patients in an intensive care unit. Overall, 16% of the family members developed probable depression, 32% had probable anxiety, and 15% had probable posttraumatic stress disorder. After adjusting for baseline anxiety, family members with higher cortisol awakening responses had an odds ratio of 1.10 (95% CI, 1.03 to 1.18) of developing probable anxiety when compared to those with lower cortisol

awakening responses. Family member experience of an intensive care unit may be associated with depression, anxiety, and posttraumatic stress disorder. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: It is important to remember that care in an intensive care unit may lead to depression, anxiety, and posttraumatic stress disorders in family members of the ill patients we treat.

**Catheter ablation for atrial fibrillation with heart failure. *N Engl J Med* 2018; 378:417–27.**

Patients with atrial fibrillation and heart failure are at greater risk for mortality and morbidity when compared to patients with heart failure alone. This study randomly assigned 362 patients with refractory atrial fibrillation and congestive heart failure with an ejection fraction of 35% or less to medical management (rate or rhythm control) or catheter ablation to determine whether there was a difference in mortality or hospitalization for congestive heart failure. Patients in the ablation group had better individual outcomes for mortality (hazard ratio, 0.53; 95% CI, 0.32 to 0.86; $P = 0.01$), hospitalization from congestive heart failure (hazard ratio, 0.56; 95% CI, 0.37 to 0.83; $P = 0.004$), and death from cardiac causes (hazard ratio, 0.49; 95% CI, 0.29 to 0.84; $P = 0.009$). Similarly, composite outcomes were lower in patients treated with ablation (hazard ratio, 0.62; 95% CI, 0.43 to 0.87; $P = 0.007$). There were no differences in hospitalization for any cause or the incidence in cerebrovascular events. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Ablation for atrial fibrillation in patients with congestive heart failure may lead to a lower rate of adverse outcomes when compared to medical management.