

ANESTHESIOLOGY



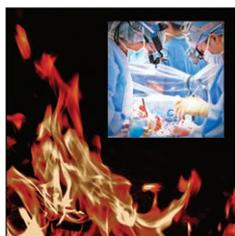
Deborah J. Culley, M.D., Editor



Causes of death of residents in ACGME-accredited programs 2000 through 2014: Implications for the learning environment. *Acad Med* 2017; 92:976–83.

Death of graduate medical trainees is a devastating personal and professional tragedy. The loss of well-educated, professionally developing physicians impacts all of society. This manuscript reviewed Accreditation Council for Graduate Medical Education (ACGME) data from 381,614 residents between 2000 and 2014. A total of 324 (220 men and 104 women) died during residency (19.96/100,000 person-years). Neoplastic disease and suicide were the most common causes. Suicide was the most common cause of death for male residents, whereas neoplastic disease was the most common cause of death for female residents. The death rate from suicide was 4.07/100,000 person-years and is significantly lower than the 13.07/100,000 death rate for the general population aged 25 to 34 yr. Resident death rates were higher during earlier phases of residency with the most vulnerable periods, including the first quarter of an academic year and after the winter holiday. The authors conclude that “strategies to reduce preventable deaths...preventive and treatment services, emergency support for trainees in distress, and ongoing monitoring and provision of wellness services that take into account the level of training...trainee [age], and...time of year.” (Summary: Alan Jay Schwartz. Image: J. P. Rathmell.)

Take home message: Resident suicide death rates are significantly lower than age-matched death rates for the general population but often occur early in residency, the first quarter of the academic year, and after a winter holiday.

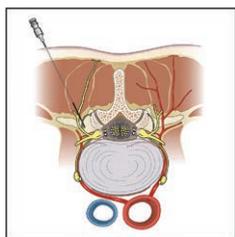


Operating room fires and surgical skin preparation. *J Am Coll Surg* 2017; 225:160–5.

Fires in the operating room are rare but devastating sentinel events. This study utilized an *ex vivo* porcine skin model to compare the combustibility of three alcohol- and two non-alcohol-based skin preparations when a “Bovie” was activated at 30 Watts for 2 s immediately, and 3 min after, application of the skin preparation. Immediately after application of the alcohol-based skin preparations, a flame flash was detected in 22% of experiments without pooling of the alcohol-based preparations and in 38% of the experiments where there was skin preparation pooling. Three minutes after application of an alcohol-based skin preparation product, a flash flame occurred in 10% of the experiments, but this increased to 27% of the experiments when there was pooling of the alcohol-based skin preparation products. There were no fires with non-alcohol-based skin preparation products. The authors conclude that the risk of intraoperative fire can be reduced by the use of non-alcohol-based skin preparation solutions. (Summary: Deborah J. Culley.

Image: J. P. Rathmell.)

Take home message: The use and pooling of alcohol-based skin preparation solutions increases the risk of an operating room fire even after waiting 3 min from the time of application to use electrocautery.



Effect of radiofrequency denervation on pain intensity among patients with chronic low back pain: The mint randomized clinical trials. *JAMA* 2017; 318:68–81.

Chronic low back pain can be disabling for affected patients. This multicenter, nonblinded, clinical trial compared pain outcomes from patients treated with radiofrequency denervation plus a standardized exercise program to those treated with a standardized exercise program alone in three separate trials (facet joint trial, $n = 251$; sacroiliac joint trial, $n = 228$; combination trial, $n = 202$). The primary outcome measure was pain measured on a 10-point scale 3 months after treatment. Clinically relevant changes were described as a 2-point decrease on the pain scale. There were no clinically relevant differences in pain scale scores by an intention to treat analysis among patients in the facet joint trial (mean group difference, -0.18 [95% CI, -0.76 to 0.40]; $P = 0.55$), sacroiliac joint trial (mean group difference, -0.71 [95% CI, -1.35 to -0.06]; $P = 0.01$), or the combination trial (mean group difference, -0.99 [95% CI, -1.73 to -0.25]; $P = 0.01$), although there were clinically irrelevant statistically significant differences in the sacroiliac joint trial and the combination trial. The authors suggest that radiofrequency denervation does not result in clinically relevant decreases in pain levels 3 months after treatment. (Summary: Deborah J. Culley. Image: Adapted with permission from Rathmell JP: *Atlas of image-guided intervention in regional anesthesia and pain medicine*, 2nd edition. Philadelphia, Lippincott, Williams & Wilkins, 2012.)

Take home message: Radiofrequency denervation may not result in clinically relevant improvements in low back pain 3 months after treatment.

MAIN OPERATING ROOM STATUS BOARD		
OR	Surgeon	Procedure
OR 01	Surgeon Dean, Laparoscopic	Cholecystectomy
OR 02	Surgeon Shamsi, Coronary Artery Bypass	Coronary Artery Bypass
OR 03	Surgeon Shamsi, Coronary Artery Bypass	Coronary Artery Bypass
OR 04	Surgeon Kelly, T&E, Right	T&E, Right
OR 05	Surgeon Kelly, T&E, Right	T&E, Right
OR 06	Surgeon Billing, Laparoscopic	Cholecystectomy

Outcomes of concurrent operations: Results from the American College of Surgeons' National Surgical Quality Improvement Program. *Ann Surg* 2017; 266:411–20.

Concurrent surgeries occur when a surgeon is engaged in two or more simultaneous surgeries with overlapping critical portions. Concurrent surgeries have come under increased scrutiny over the past few years as they may be associated with increased risk for adverse outcomes and the ethical questions surrounding failure to inform patients about the practice. This retrospective cohort study interrogated the National Surgical Quality Improvement Program database, identified 533,666 surgical procedures, and found that 2.3% of the surgical procedures occurred concurrently. Before propensity score matching, concurrent surgical procedures were found to be associated with an increased rate of death or serious morbidity (primary outcome) when compared to those not performed concurrently (9.0% vs. 7.1%; $P < 0.001$). However, after propensity score matching there were no statistically significant differences in the rate of death or serious morbidity. The authors interpreted this as a negative result, but cautioned that additional studies, proactive self-disclosure to patients, and regulation may be necessary in the future. (Summary: Peter Nagele. Image: J. P. Rathmell.)

Take home message: This retrospective study suggests that there are no differences in death and serious morbidity associated with concurrent surgical procedures.



Mortality risks associated with emergency admissions during weekends and public holidays: An analysis of electronic health records. *Lancet* 2017; 390:62–72.

Weekend and holiday hospital admissions have been associated with an increased risk of mortality. This study investigated 30-day mortality in 257,596 patients following 503,938 emergency hospital admissions in four United Kingdom hospitals and adjusted for multiple patient, laboratory, and workload confounding variables. The authors report that the risk of 30-day mortality was higher when patients were admitted on a weekend (5.1%) or a holiday (5.8%) when compared to those admitted on a weekday (4.7%) prior to adjusting for confounding variables ($P < 0.001$). However, after adjusting for potential patient and laboratory confounding variables, there were no differences in 30-day mortality between the groups. Measures of hospital workload were not associated with 30-day mortality ($P > 0.06$). Interestingly, there was a higher risk of 30-day mortality in patients admitted on the weekends between the hours of 1:00 and 3:00 PM ($P = 0.04$). These data suggest that the mortality associated with weekend or holiday hospital admission likely results from patient acuity at the time of hospital admission. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Patient acuity may account for the increased 30-day mortality rate associated with weekend and holiday hospital admissions.



Effect of abdominal ultrasound on clinical care, outcomes, and resource use among children with blunt torso trauma: A randomized clinical trial. *JAMA* 2017; 317:2290–6.

A Focused Assessment with Sonography for Trauma (FAST) is a current level 1 recommendation for adults with penetrating abdominal or torso trauma. It can quickly and inexpensively identify the presence of clinically significant abdominal hemorrhage with reasonable sensitivity and specificity. This study aimed to identify whether a FAST in hemodynamically stable children improved patient outcomes. A total of 925 hemodynamically stable children under 18 yr old with blunt torso trauma were randomized to a standard trauma assessment or a standard trauma assessment plus a FAST. The authors observed that the addition of the FAST had no effect on subsequent computed tomography scans ($P = 0.50$), missed intra-abdominal injuries ($P = 0.50$), or emergency department length of stay ($P = 0.88$).

The authors conclude that the routine use of a FAST in hemodynamic pediatric patients that are hemodynamically stable following blunt torso trauma may not improve outcomes. (Summary: Peter Nagele. Image: Etan J. Tal (own work), via Wikimedia Commons, CC BY 3.0, <http://creativecommons.org/licenses/by/3.0/>)

Take home message: FAST may not improve outcomes in pediatric patients with blunt torso trauma.



Effect of intra-articular triamcinolone vs saline on knee cartilage volume and pain in patients with knee osteoarthritis: A randomized clinical trial. *JAMA* 2017; 317:1967–75.

The use of intra-articular steroid injections to control pain secondary to osteoarthritis is very common. Concerns have been raised, however, about the safety and efficacy of these steroid injections over time. This article describes a randomized, blinded, placebo-controlled, 2-yr trial involving the injection of 40 mg triamcinolone or vehicle every 3 months into the knee joints of 140 patients with osteoarthritis. The co-primary outcomes were change in knee cartilage volume assessed using cartilage thickness observed on magnetic resonance imaging scans, and change in pain, assessed using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain subscale. After 2 yr of treatment it was observed that steroid-injected patients had greater cartilage loss than those injected with vehicle ($P = 0.01$), and there were no differences in pain scores ($P = 0.17$). An important caveat of the report is that pain scores were not assessed during the first few weeks after each injection when improvements are most likely to be experienced. This report supports concerns about the long-term use of intra-articular glucocorticoid steroids for osteoarthritic pain. (Summary: J. David Clark. Image: © ThinkStock.)

Take home message: Repeated administration of steroids into the intra-articular joint may lead to enhanced cartilage loss without an improvement in pain.



New persistent opioid use after minor and major surgical procedures in US adults. *JAMA Surg* 2017; 152:e170504.

The persistent use of opioids after surgery in patients without a history of opioid use may be one of the contributors to the current opioid epidemic, yet little is known about its incidence. This study attempted to address this question by using a nationwide insurance claims data set from 2013 to 2014 to identify opioid-naïve patients filling opioid prescriptions for more than 90 days after their incident surgical procedure in 36,177 patients. Of interest, the incidence rate of new persistent opioid use was 5.9% after minor surgery, 6.5% after major surgery, and 0.4% in a control group that did not have surgery. Risk factors for the development of new persistent opioid use were tobacco abuse, alcohol and substance abuse, mood disorders, pain disorders, and arthritis, and an opioid prescription within 30 days of their surgical procedure. The authors conclude that new persistent pain disorders are common for at least 90 days after

a surgical procedure and are more likely due to patient-level factors rather than procedure. (Summary: Peter Nagele. Image: J. P. Rathmell.)

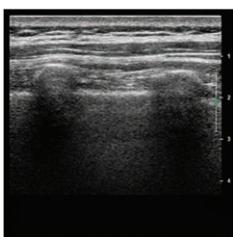
Take home message: Persistent opioid use after a surgical procedure occurs in 6% of opioid-naïve patients.



The fifth vital sign: Postoperative pain predicts 30-day readmissions and subsequent emergency department visits. *Ann Surg* 2017; 266:516–24.

Postoperative pain is common after surgery and anesthesia. This study investigated whether postoperative pain was a predictor of 30-day postoperative emergency department visits or hospital readmissions using a retrospective cohort study design involving 211,231 surgical procedures identified in the Veteran Administration Surgical Quality Improvement Program database. After adjusting for patient and operative variables, the authors report that higher postoperative pain trajectories were associated with both 30-day emergency department visits and hospital readmission. Patients in the highest pain trajectory group were four times more likely to experience a pain-related readmission than those in the lowest pain trajectory group ($P < 0.001$). The authors suggest that additional studies are needed to identify pain management interventions that may lead to improvements in 30-day pain outcomes. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Postoperative pain trajectories may be associated with risk of 30-day emergency room visits and hospital readmission.



Ultrasound as a screening tool for central venous catheter position and exclusion of pneumothorax. *Crit Care Med* 2017; 45:1192–8.

A chest radiograph is often obtained after placement of a central venous catheter, as it is the gold standard for verifying the position of the central venous catheter and exclusion of a pneumothorax. This study investigated the use of ultrasound to identify whether it was noninferior to the gold standard in verifying correct placement of a central venous catheter and screening for the presence of a pneumothorax. Among the 137 patients enrolled in the study, 124 had adequate ultrasound views to identify correct placement of the central catheter. Among these, ultrasound was able to identify correct placement of the central venous catheter in 97% of patients, whereas the use of a chest radiograph identified correct placement of the central venous catheter in 99.3%. No patients were identified as having a pneumothorax by either ultrasound or chest radiograph. The study suggests that transthoracic ultrasound may be noninferior

to the gold standard when adequate ultrasound views are obtained but that a high body mass index may limit one's ability to acquire adequate transthoracic ultrasound views. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: When adequate transthoracic ultrasound views are obtained, the use of ultrasound to identify the position of a central venous catheter and rule out a pneumothorax may be noninferior to the gold standard chest radiograph.



Non-technical skills of surgeons and anaesthetists in simulated operating theatre crises. *Br J Surg* 2017; 104:1028–36.

Nontechnical skills of both surgeons and anesthesiologists have been implicated in operating room errors that can lead to adverse patient outcomes. This study assessed nontechnical skills during two simulated crises (hemorrhage with hemodynamic instability and a difficult airway requiring a surgical airway) in surgeons and anesthesiologists. Performance was scored using the Non-technical Skills for Surgeons and the Anaesthetists Non-technical Skills rating scales in 13 surgical teams. Nontechnical skill scores were higher before a simulated crisis than they were during the crisis for both surgeons ($P < 0.03$) and anesthesiologists ($P < 0.001$). The performance of anesthesiologist was similar for both simulated crises ($P = 0.895$), whereas surgeons had better nontechnical skills in the hemorrhage scenario when compared to the airway scenario ($P < 0.001$). Higher nontechnical skill scores during the simulated crisis were

associated with faster crisis resolution for both surgeons ($P = 0.001$) and anesthesiologists ($P = 0.009$). (Summary: Deborah J. Culley. Image: Courtesy of Brigham and Women's Hospital, STRATUS Center for Medical Simulation.)

Take home message: Better performance on nontechnical skills may be associated with faster crisis resolution in a simulated environment.



Use of unsolicited patient observations to identify surgeons with increased risk for postoperative complications. JAMA Surg 2017; 152:522–9.

Patient dissatisfaction has been associated with risk for malpractice claims against physicians. This study used a retrospective cohort design to investigate whether the behaviors leading to unsolicited patient observations of surgeons by patients during the 2 yr before a surgical procedure was associated with worse postoperative outcomes. The authors used the American College of Surgeons' National Surgical Quality Improvement Program database and the Vanderbilt Patient Advocacy Reporting System from seven institutions participating in both databases. The study included 32,125 patients from 187 surgeons who had an average of 11 unsolicited patient observations. On multivariate analysis, patients with surgeons in the highest quartile for unsolicited patient observations (14 to 60 observations) during the 24 months before surgical procedure were more likely than patients with surgeons in the lowest quartile (0 to

4 observations) to have any postoperative complications (odds ratio = 1.0063; 95% CI, 1.0004 to 1.0123; $P = 0.03$). This corresponds to a 13.9% higher complication rate among patients with surgeons in the highest quartile when compared to those in the lowest quartile for unsolicited patient observations. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Unsolicited patient observations may be associated with higher surgical complication rates.