

ANESTHESIOLOGY

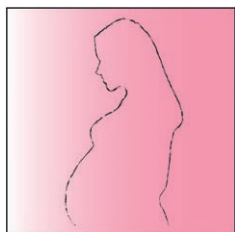


Deborah J. Culley, M.D., Editor

**Effect of home monitoring via mobile app on the number of in-person visits following ambulatory surgery: A randomized clinical trial. JAMA Surg 2017; 152:622–7.**

In this era of patient-centered care there is a growing interest in the utilization of information technology. This study was designed to determine whether the use of a mobile app for follow-up care after ambulatory breast surgery decreases the number of face-to-face follow-up care visits when compared to conventional follow-up. Sixty-five patients undergoing breast surgery were randomly assigned to mobile app or an in-person visit for follow-up care. The primary endpoint was the number of in-person follow-up visits in the 30 days after surgery. Secondary endpoints included the number of calls/emails to healthcare professionals, patient-reported convenience/satisfaction, and complication rates. Patients randomized to the mobile app for follow-up had 0.40 (95% CI, 0.24 to 0.66) fewer in-person visits ($P < 0.001$), sent more emails to their healthcare provider ($P = 0.005$), and had higher convenience scores ($P = 0.008$) when compared to the patients receiving in-person follow-up care with no differences in the number of phone calls, satisfaction scores, or complications. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Follow-up care using a mobile app may decrease the number of in-person follow-up visits after ambulatory surgery with no effect on postoperative complication rates.

**The risk of adverse pregnancy outcomes following nonobstetric surgery during pregnancy: Estimates from a retrospective cohort study of 6.5 million pregnancies. Ann Surg 2017; 266:260–6.**

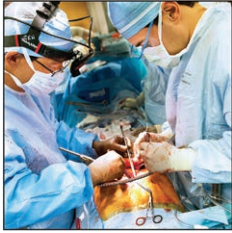
Nonobstetric surgery occurs in more than 1% of pregnancies with considerable concern about both maternal and fetal postoperative outcomes. This study describes a retrospective analysis of data from the Hospital Episode Statistics database, which includes all admission to English National Health Service hospital trusts. They identified 6,486,280 pregnancies in which 47,628 nonobstetric surgical procedures were performed. The authors note that while the risk associated with nonobstetric surgery was low, there was increased risk of miscarriage (risk ratio [RR] = 1.13; 95% CI, 1.09 to 1.17), stillbirth (RR = 1.64; 95% CI, 1.50 to 1.81), preterm delivery (RR = 1.43; 95% CI, 1.39 to 1.47), low birth weight (RR = 1.49; 95% CI, 1.44 to 1.54), cesarean section (RR = 1.21; 95% CI, 1.10 to 1.23), longer hospital length of stay (RR = 1.22; 95% CI, 1.20 to 1.25), and higher maternal death (RR = 4.72; 95% CI, 2.61 to 8.52). Interestingly, laparoscopic abdominal surgery was associated with a higher risk of miscarriage when compared to open abdominal surgery (RR = 3.82; 95% CI, 3.29 to 4.41). (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: This retrospective study suggests that the risk of adverse outcomes after nonobstetric surgery during pregnancy is low but higher than those pregnancies without surgery during pregnancy.

**Estimating risk of postsurgical general and geriatric complications using the VESPA preoperative tool. JAMA Surg 2017 Aug 2 [Epub ahead of print].**

As the number of older patients presenting for elective surgery increases, there is great interest in geriatric-specific assessments that can be used preoperatively to estimate the risk of postoperative complications. This study investigated whether screening with the Vulnerable Elders Surgical Pathways and Outcomes Assessment (VESPA) tool, designed specifically for this study, could predict adverse outcomes in surgical patients 70 yr of age and older. The screening tool collected activities of daily living, history of falls or impairments in walking, depression, and cognitive performance, and it was used on 770 patients. Of these 770, 711 patients had complete data. Twenty-five percent of these patients had adverse postoperative outcomes. Predictors of adverse outcomes on multivariate logistic regression analysis included poor performance on activities of daily living ($P = 0.03$), self-assessed inability to manage themselves alone after discharge ($P = 0.03$), male sex ($P = 0.02$), high Charleston Comorbidity Index ($P = 0.05$), and complexity of the surgical procedure ($P = 0.001$). Interestingly, the percentage with poor preoperative cognitive performance was low (5.5%) in this patient population relative to what is found in community-dwelling elders and was not a predictor of adverse outcomes. (Summary: Deborah J. Culley. Image: ©ThinkStock.)

Take home message: A geriatric-focused preoperative evaluation may aid in predicting adverse outcomes in older surgical patients.



Variation and impact of multiple complications on failure to rescue after inpatient surgery. *Ann Surg* 2017; 266:59–65.

Failure to rescue after inpatient surgery is defined as the inability to prevent death after complication(s) and the inability to mitigate subsequent preventable harm. This study used the Veterans Affairs Surgical Quality Improvement Program database to determine if multiple, sequential complications had an influence on mortality rates after inpatient surgery. Among 266,101 patients who underwent major high-risk noncardiac surgery (general, vascular, thoracic) between 2000 and 2014, patients who experienced more than one complication accounted for 63% of all observed mortality. Not surprisingly, more complications were associated with higher mortality. Failure to rescue occurred predominantly among patients who experience more than one complication after major noncardiac surgery ($P < 0.001$). The authors conclude that hospital efforts should be directed at identifying and preventing secondary complications after patients have experienced a major complication after surgery. (Summary: Peter Nagele. Image: J. P. Rathmell.)

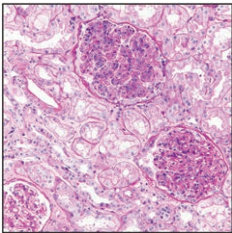
Take home message: Failure to rescue was associated with multiple complications after surgery.



Association between preoperative hemoglobin A_{1c} levels, postoperative hyperglycemia, and readmissions following gastrointestinal surgery. *JAMA Surg* 2017 Jul 26 [Epub ahead of print].

Hyperglycemia in the preoperative period has been associated with adverse postoperative outcomes. This study investigated whether preoperative hemoglobin A_{1c} (HbA_{1c}) or early postoperative glucose levels predicted postoperative complications and higher readmission rates in an observational cohort study involving 21,541 patients having gastrointestinal surgery performed at 17 Veterans Affairs hospitals between 2007 and 2014. Higher preoperative HbA_{1c} levels were associated with higher risk of having any complication ($P < 0.01$), but were not associated with greater readmission rates. However, peak 48-h postoperative glucose levels were associated with both postoperative complications ($P < 0.001$) and readmission within 14 days or 30 days of discharge ($P < 0.001$). Patients with a preoperative HbA_{1c} above 6.5% had more postoperative glucose level checks when compared to patients with a HbA_{1c} at or below 6.5% ($P < 0.001$). (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Preoperative HbA_{1c} levels above 6.5% may be associated with a higher risk of postoperative complications.



Acute kidney injury in burn patients: Clinically significant over the initial hospitalization and 1 year after injury: An original retrospective cohort study. *Ann Surg* 2017; 266:376–82.

Acute kidney injury (AKI) is common after a burn injury and is associated with significant morbidity and mortality. This study used Healthcare Cost and Utilization Project State Inpatient Databases between 2009 and 2013 to identify 18,155 adult patients admitted with burn injuries associated with AKI. AKI was observed in nearly 5% of the patients. Risk factors for AKI after a burn injury include older age ($P < 0.001$), burn severity ($P < 0.001$), and the presence of other comorbidities ($P < 0.001$). AKI in the setting of a burn injury was associated with increased risk of pulmonary insufficiency, wound infection, myocardial infarction, mortality, discharge to place other than home, and higher hospital costs ($P < 0.001$). Patients with AKI were also more likely to develop chronic kidney disease and require chronic dialysis than those patients without AKI ($P < 0.001$). (Summary: Deborah J. Culley. Image: Photomicrograph of acute glomerulonephritis, ©2011 Michael Bonert [https://commons.wikimedia.org/wiki/User:Nephron].)

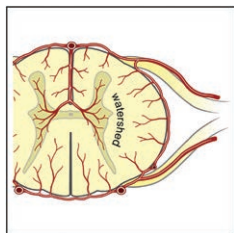
Take home message: Acute kidney injury in the setting of a burn injury may be associated with increased morbidity and mortality in adult patients.



Timing of femoral shaft fracture fixation following major trauma: A retrospective cohort study of United States trauma centers. *PLoS Med* 2017; 14:e1002336.

Fracture of the femoral shaft is a common and severe injury requiring operative repair. It is generally assumed that early definitive fixation (within first 24 h) is associated with improved outcomes, but strong evidence is lacking. In this nationwide retrospective cohort study using the American College of Surgeons Trauma Quality Improvement Program, data from 216 trauma centers were queried to determine if delayed fixation (more than 24 h) was associated with worse outcomes. The investigators identified 17,993 patients who underwent definitive fixation for femoral shaft fracture. In 26% of patients, operative fixation was delayed. Patients treated at hospitals in the highest quartile of delayed fixation had a twofold increased risk of pulmonary embolism and a 60% increase in mortality. The authors acknowledge the inability to classify injury severity and the heterogeneity of the study population as important limitations. Despite these limitations, the results of the study strongly suggest repair of femoral shaft fractures within 24 h. (Summary: Peter Nagele. Image: J. P. Rathmell.)

Take home message: Repair of femoral shaft fractures within the first 24 h may be associated with better outcomes.



Rates of spinal cord infarction after repair of aortic aneurysm or dissection. *Stroke* 2017; 48:2073–7.

Spinal cord infarction is a severe complication after repair of both aortic aneurysms and dissections, although the incidence of this complication is unknown. The authors used administrative claims data to identify the risk of spinal cord infarction among patients undergoing aortic repair. Among the 91,212 patients who underwent aortic repair, spinal cord infarction was diagnosed in 0.26%. The risk of spinal cord infarction was higher after ruptured aortic dissections or aneurysms (0.74%) compared to those that were unruptured (0.16%). No differences were found between endovascular *versus* open surgical repair for ruptured aortic dissections or aneurysms ($P = 0.15$), but there was a higher risk of spinal cord infarction with surgical repair of unruptured aortic aneurysms or dissections (0.20%; 95% CI, 0.15 to 0.25%) when compared to endovascular repair (0.11; 95% CI, 0.08 to 0.14%; $P < 0.001$). The authors concluded

that the risk of spinal cord infarction after ruptured aortic aneurysm or dissection is approximately 1:130 patients, whereas among those with an unruptured aortic aneurysm or dissection, the risk is 1:600. (Summary: Peter Nagele. Illustration: G. Nelson, modified with permission from *Complications in Regional Anesthesia and Pain Medicine*, 2nd ed., Philadelphia, Lippincott, Williams & Wilkins, 2012.)

Take home message: Spinal cord infarction is higher after ruptured aortic aneurysm or dissection repair when compared to those that are not ruptured. Endovascular treatment was associated with lower risk of spinal cord infarction in patients with an unruptured aorta.

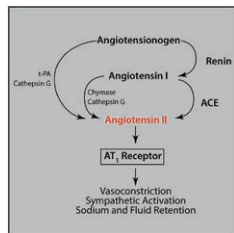


Staging a performance: Learners' perceptions about direct observation during residency. *Med Educ* 2017; 51:498–510.

Direct observation is a widely used method for assessing resident performance that is frequently used to provide formative feedback. This article describes learners' experiences and impressions with being observed to identify the components of direct observation that are valuable for learners by conducting private, semistructured interviews of 22 residents in multiple medical specialties. From the responses, general themes were identified, including that direct observation was noted to be important for resident education although it may cause emotional discomfort that impacts performance, alter the provider-patient relationship, and cause the resident to deviate from his or her usual clinical approach to match what they believe to be the observer's expectation. These unintended consequences could impact not only the value of feedback but also the validity of assessment. Ideas for mitigating the negative consequences are included and the conclusion states that "to

nurture learners' professional development, educators must create a culture of observation-based coaching that is divorced from assessment and is tailored to developing the learners' identities as practitioners of both the art and the science of medicine." This article provides insight on limitations to direct observation and ideas for optimizing its value. (Summary: Cathleen Peterson-Layne. Image: J. P. Rathmell.)

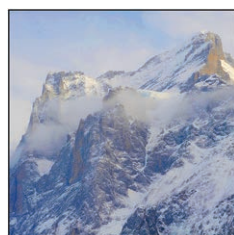
Take home message: Direct observation of resident trainees may have unintended consequences that can impede an accurate assessment.



Angiotensin II for the treatment of vasodilatory shock. *N Engl J Med* 2017; 377:419–30.

Vasodilatory shock is associated with high mortality if not responsive to high-dose vasopressors. This study randomized patients requiring more than $0.2 \mu\text{g} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$ of norepinephrine or the equivalent for the treatment of vasodilatory shock, to treatment with angiotensin II or placebo. Three hundred and twenty-one patients were included in the analysis. Three hours after infusion of angiotensin II or placebo, 70% of patients treated with angiotensin II and 23% treated with placebo had an increase in their mean arterial pressure of at least 10 mmHg or to at least 75 mmHg (primary outcome, odds ratio = 7.05; 95% CI, 4.76 to 13.3; $P < 0.001$). There were also improvements in their cardiovascular Sequential Organ Failure Assessment scores (-1.75 ± 1.77 vs. -1.28 ± 1.65 between the angiotensin II group and placebo, respectively; $P < 0.01$) and decreases in norepinephrine dosages, or the equivalent (-0.03 ± 0.10 vs. 0.03 ± 0.23 ; $P < 0.01$). There were no differences in serious adverse events or 28-day mortality rate. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

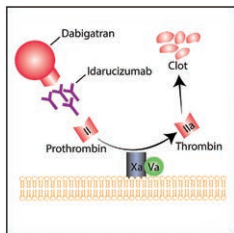
Take home message: The administration of angiotensin II to patients with vasodilatory shock that is refractory to conventional vasopressor therapy may increase mean arterial pressure.



Targeted temperature management for 48 vs 24 hours and neurologic outcome after out-of-hospital cardiac arrest: A randomized clinical trial. *JAMA* 2017; 318:341–50.

Cooling to between 33°C and 36°C for 24 h after successful initial resuscitation from cardiac arrest is recommended by international guidelines. The optimal duration of cooling, however, is unclear. This international multicenter clinical trial randomized 355 adult unconscious patients after out-of-hospital cardiac arrest in 10 intensive care units to either 24 h (current standard) or 48 h of cooling. The primary outcome was 6-month neurologic outcome. The authors observed a 5% difference in favorable neurologic outcome (69% [48 h] vs. 64% [24 h]), but this difference was not statistically significant ($P = 0.33$). Six-month mortality was 27% (48 of 175) in the 48-h group and 34% (60 of 177) in the 24-h group ($P = 0.19$). The authors concluded that the study did not demonstrate a statistically significant difference between the two groups, but this may be because the study was underpowered to detect a smaller treatment effect. (Summary: Peter Nagele. Image: J. P. Rathmell.)

Take home message: There were no outcome differences among patients initially resuscitated from a cardiac arrest and subsequently treated with 48 h compared to 24 h of hypothermia.



Idarucizumab for dabigatran reversal—Full cohort analysis. *N Engl J Med* 2017; 377:431–41.

Reversal of the anticoagulant effects of dabigatran is thought to occur with administration of a monoclonal antibody fragment, idarucizumab. This multicenter study administered 5 g of idarucizumab to 503 patients taking dabigatran with uncontrolled bleeding or scheduled for an urgent procedure. Of these, 461 had abnormal diluted thrombin time or ecarin clotting time and were included in the analysis. The primary outcome measure was the percentage of patients where idarucizumab reversed anticoagulant effects of dabigatran based on normalization of the diluted thrombin time or ecarin clotting time within 4 h after the second administration of idarucizumab. All patients had reversal of the anticoagulation effects of dabigatran. Among the 197 patients who underwent an urgent procedure, hemostasis was judged to be normal in 93%, mildly abnormal in 5%, and moderately abnormal in 2%. The overall 90-day mortality rate

was 19%. (Summary: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Reversal of the anticoagulant effects of dabigatran with administration of idarucizumab may be effective in the majority of patients with uncontrolled bleeding or scheduled for an urgent procedure.