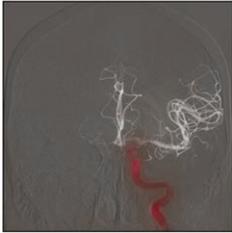


## ANESTHESIOLOGY



Jean Mantz, M.D., Ph.D., Editor†

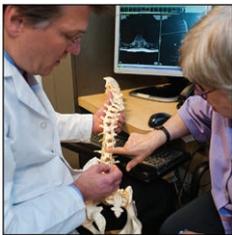


### Effect of conscious sedation vs. general anesthesia on early neurological improvement among patients with ischemic stroke undergoing endovascular thrombectomy: A randomized clinical trial. *JAMA* 2016; 316:1986–96.

Rapid thrombectomy for acute ischemic stroke is being used more frequently as evidence for this technique accumulates. The optimal anesthetic conditions for this procedure have not been defined. Many physicians prefer conscious sedation to general anesthesia due to the perceived lower risks of some complications and retrospective data suggesting higher reperfusion rates than observed when using general anesthesia. The authors conducted a randomized trial with 150 acute stroke patients to address this issue. The primary outcome was neurological improvement on the National Institute of Health Stroke Scale 24 h after admission. The investigators failed to identify differences in the 24-h

National Institute of Health Stroke Scale score between the conscious sedation and general anesthesia groups. In addition, neither in-hospital nor 90-day mortality differed between the groups. On the other hand, greater than 14% of the sedation procedures were converted to general anesthesia. Overall the data were interpreted to show no overall advantages in terms of outcome for conscious sedation when used for acute thrombectomy. (Summary: David Clark. Image: Thabele Leslie-Mazwi, M.D., Massachusetts General Hospital.)

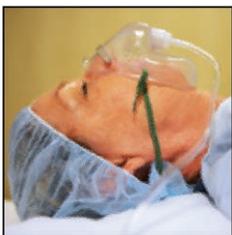
**Take home message:** Conscious sedation offers no advantage over general anesthesia for acute thrombectomy for stroke.



### Surgeon perception of risk and benefit in the decision to operate. *Ann Surg* 2016; 264:896–903.

The decision to operate on a patient often falls in a gray area in which the best treatment option is unclear. Little is known about what makes one surgeon choose to operate and another choose not to operate. The goal of this study was to determine how surgeons' perceptions of treatment risks and benefits influence their decisions to operate. A U.S. national sample of 767 surgeons reviewed four detailed clinical vignettes (mesenteric ischemia, gastrointestinal bleed, bowel obstruction, appendicitis) where the best treatment option was uncertain. They were asked to judge the risks (probability of serious complications) and benefits (probability of recovery) for operative and nonoperative management and to decide whether or not they would recommend an operation. Across all clinical vignettes, surgeons varied markedly in both their assessments of the risks and benefits of operative and nonoperative management (narrowest range 4 to 100% for all four predictions across vignettes) and in their decisions to operate (49 to 85%). Differences in risk/benefit perceptions accounted for 39% of the observed variation in decisions to operate across the four vignettes. (Summary: J. Mantz. Image: J. P. Rathmell.)

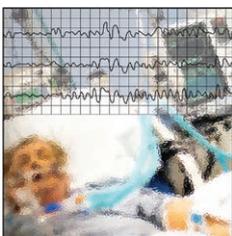
**Take home message:** Surgeons' perceptions of treatment risks and benefits vary and are highly predictive of their decisions to operate.



### Effect of early postextubation high-flow nasal cannula vs. conventional oxygen therapy on hypoxaemia in patients after major abdominal surgery: A French multicentre randomised controlled trial (OPERA). *Intensive Care Med* 2016; 42:1888–98.

The use of supplemental oxygen delivery *via* high-flow nasal cannula (HFNC) after major abdominal surgery has been proposed as a means to prevent hypoxemia. This French multicenter randomized controlled trial was designed to evaluate the efficacy of this approach. The trial included 220 adult patients at moderate to high risk of postoperative pulmonary complications who had undergone major abdominal surgery using lung-protective ventilation. Patients were randomly assigned to receive either HFNC oxygen therapy or standard oxygen therapy (low-flow oxygen delivered *via* nasal prongs or facemask) directly after extubation. The primary outcome was an absolute risk reduction for hypoxemia at 1 h after extubation and after treatment discontinuation. Twenty-three (21%) of the 108 patients treated with HFNC 1 h after extubation and 29 (27%) of the 108 patients after treatment discontinuation had postextubation hypoxemia, compared with 27 (24%) and 34 (30%) of the 112 patients treated with standard oxygen (absolute risk reduction 4, 95% CI, -8 to 15%;  $P = 0.57$ ; adjusted relative risk 0.87; 95% CI, 0.53 to 1.43;  $P = 0.58$ ). (Summary: J. Mantz. Image: J. P. Rathmell.)

**Take home message:** Among patients undergoing major abdominal surgery, early preventive application of high-flow nasal cannula oxygen therapy after extubation did not result in improved pulmonary outcomes compared with standard oxygen therapy.



### Bedside quantitative electroencephalography improves assessment of consciousness in comatose subarachnoid hemorrhage patients. *Ann Neurol* 2016; 80:541–53.

Accurate behavioral assessments of consciousness carry tremendous significance in guiding management, but these assessments are challenging in acutely brain-injured patients. This retrospective cohort study was aimed at evaluating whether electroencephalography and multimodality monitoring parameters may facilitate assessment of consciousness in patients with subarachnoid hemorrhage. Eighty-three consecutively treated adults with subarachnoid hemorrhage who were initially comatose had behavioral assessments during daily interruption of sedation and were categorized into three groups based on their best examination as (1) comatose, (2) arousable (eye opening or attending toward a stimulus), and (3) aware (command following). Electroencephalography features included spectral power and complexity measures. Of the 389 artifact-free electroencephalography clips following behavioral assessment, increasing central gamma, posterior alpha, and diffuse theta-delta oscillations differentiated patients who were arousable from those in coma. Command following was characterized by a further increase in central gamma and posterior alpha rhythms, as well as an increase in alpha permutation entropy. (Summary: J. Mantz. Image: J. P. Rathmell.)

**Take home message:** Electroencephalography measures of behavioral states provide distinctive signatures that complement behavioral assessments of patients with subarachnoid hemorrhage shortly after the injury.

†Deceased.



### Randomized trial of video laryngoscopy for endotracheal intubation of critically ill adults. *Crit Care Med* 2016; 44:1980–7.

Data are conflicting as to whether video laryngoscopy (VL) results in increased intubation success on the first attempt, decreased complications, or improved clinical outcomes. Along with the need to train operators on multiple devices, these conflicting results have limited the use of VL for the intubation of critically ill patients. This randomized controlled trial included 150 intensive care unit patients undergoing tracheal intubation and was aimed at evaluating the effect of VL compared with direct laryngoscopy on the success rate tracheal intubation by trainees. The primary outcome was the rate of intubation on first attempt, adjusted for the operator's previous experience with the intubating device at the time of the procedure. Despite better glottic visualization with VL, there was no difference in the primary outcome

(video 68.9% vs. direct 65.8%;  $P = 0.68$ ) or the complication rate of intubation. (Summary: J. Mantz. Image: M. Tillquist, Brigham and Women's Hospital.)

**Take home message:** In critically ill adults undergoing endotracheal intubation, VL did not appear to increase procedural success or decrease complications.



### Epidemiological characteristics, practice of ventilation, and clinical outcome in patients at risk of acute respiratory distress syndrome in intensive care units from 16 countries (PRoVENT): An international, multicentre, prospective study. *Lancet Respir Med* 2016; 4:882–93.

Scant information exists about the epidemiological characteristics and outcome of patients in the intensive care unit at risk of acute respiratory distress syndrome (ARDS) and how ventilation is managed in these individuals. This international multicenter prospective study aimed to establish the epidemiological characteristics of patients at risk of ARDS, describe ventilation management in this population, and assess outcomes compared with people at no risk of ARDS.

The Lung Injury Prediction Score was used to stratify risk of ARDS, with a score of 4 or higher defining those at risk of

ARDS. The primary outcome was the proportion of patients at risk of ARDS. Nine hundred thirty-five mechanically ventilated patients fulfilled the inclusion criteria. Of these critically ill patients, 282 were at risk of ARDS (30%; 95% CI, 27 to 33), tidal volume was similar for patients at risk and not at risk of ARDS (median, 7.6 ml/kg predicted body weight [interquartile range, 6.7 to 9.1] vs. 7.9 ml/kg predicted body weight [6.8 to 9.1];  $P = 0.346$ ). Positive end-expiratory pressure was higher in patients at risk of ARDS compared with those not at risk (median, 6.0 cm H<sub>2</sub>O [interquartile range, 5.0 to 8.0] vs. 5.0 cm H<sub>2</sub>O [5.0 to 7.0];  $P < 0.0001$ ). The prevalence of ARDS in patients at risk of ARDS was higher than in individuals not at risk of ARDS and mortality in ARDS patients was twice that of non-ARDS patients. (Summary: J. Mantz. Image: J. P. Rathmell.)

**Take home message:** Around a third of patients receiving mechanical ventilation in the intensive care unit were at risk of ARDS. There is potential for improvement in the management of patients without ARDS.



### Is pain perception altered in people with depression? A systematic review and meta-analysis of experimental pain research. *Pain* 2016; 17:1257–72.

Although clinical studies suggest depressed patients may be more vulnerable to pain, experimental research is equivocal. The purpose of this meta-analysis was to clarify whether depression is associated with altered pain perception in response to noxious stimulation and to identify factors that might influence this association. The meta-analysis was conducted on data from 32 studies that included 1,317 patients. For high-intensity noxious stimulation, overall pain tolerance was similar across depressed and control groups. In contrast, for low-intensity stimulation, a small, but statistically significant higher mean sensory threshold (9 studies) and pain threshold (25 studies) was observed in depressed participants, suggesting diminished pain. However, considerable heterogeneity in the direction and magnitude of effects was observed, indicating a likely condition-specific effect of depression on pain. Overall, results provide some support for altered pain processing in depression, but suggest this link is dependent upon modality and additional, unidentified factors. (Summary: J. Mantz. Image: J. P. Rathmell.)

**Take home message:** Pain processing may be minimally altered in patients with depression.



### Correlations between ratings on the resident annual evaluation summary and the internal medicine milestones and association with ABIM certification examination scores among US internal medicine residents, 2013–2014. *JAMA* 2016; 316:2253–62.

Implementation of the Accreditation Council for Graduate Medical Education (ACGME) Milestones aimed to evaluate resident development over the course of training. One of the primary outstanding questions is the validity of this approach compared to the traditional, nondevelopmental resident annual evaluation summary (RAES). This study included more than 21,000 internal medicine residents nationwide in 2013 to 2014 and compared the two assessment approaches focusing on two of the ACGME core competencies, medical knowledge and professionalism. The results demonstrated that for medical knowledge over the course of training time, *i.e.*, postgraduate year 1 to 3, the result was linear with both

evaluation techniques, but the slope was greater using milestones. This suggests that the development-based evaluation correlates with the RAES and allows for better differentiation and demonstration of improvement over the time of training. Given trainees who failed the board certification exam also scored lowest in these evaluations, this indicates reliability of these evaluations for predicting future performance. Evaluation of professionalism is challenging. This study reveals that residents with a low or borderline low rating using the milestones were rated as "satisfactory" or "superior" using the RAES. This suggests that the milestones evaluation allows for enhanced discernment of unprofessional behaviors. The description of behaviors to be demonstrated in each step of the milestones allows for decreased subjectivity. (Summary: Cathleen Peterson Layne. Image: J. P. Rathmell.)

**Take home message:** This study of internal medicine residents infers validity of evaluation using the ACGME milestones.