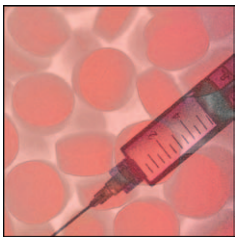
Key Papers from the Most Recent Literature Relevant to Anesthesiologists

ANESTHESIOLOGY

Jean Mantz, M.D., Ph.D., Editor

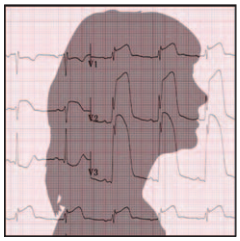
A randomized trial of intraarterial treatment for acute ischemic stroke. N Engl J Med 2015; 372:11–20.

Intraarterial intervention is effective for emergency revascularization in patients with acute ischemic stroke caused by a proximal intracranial arterial occlusion, yet the benefit of such intervention on functional outcome is unproven. This randomized controlled trial enrolled 500 patients on intravenous alteplase for the treatment of proximal arterial occlusion in the anterior cerebral circulation within 6 h of showing symptoms. The primary outcome was a modified Rankin scale score at 90 days. It was shown that intraarterial therapy (mechanical treatment, intraarterial thrombolysis, or both) plus standard therapy (which could include intravenous alteplase) significantly improved primary outcome in comparison with standard therapy alone. These important results will have major impact on the approach of acute stroke therapy. *(Summary: J. Mantz. Illustration: J.P. Rathmell.)*



Trends in opioid analgesic abuse and mortality in the United States. N Engl J Med 2015; 372:241–8.

In 2010, there were 16,651 opioid-related deaths in the United States. This paper reports trends in the diversion and abuse of prescription opioids using data from five programs from the Research Abuse, Diversion, and Addicted-Related Surveillance (RADARS) System from 2002 to 2013. Prescriptions for opioid analgesics and rate of opioid-related deaths increased substantially between 2002 and 2010 but saw a slight decrease from 2011 through 2013. This indicates progress in the control of the abuse of opioid analgesics in the United States. *(Summary: J. Mantz. Image: J.P. Rathmell.)*



High sensitivity cardiac troponin and the under-diagnosis of myocardial infarction in women: Prospective cohort study. BMJ 2015; 350:g7873. doi: 10.1136/bmj.g7873.

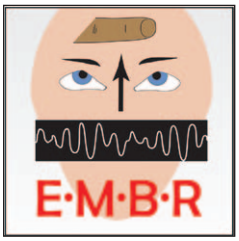
Single diagnostic thresholds may lead to the under-diagnosis of myocardial infarction in women and contribute to sex inequalities in regard to treatment and outcomes. In this prospective cohort study, consecutive patients with suspected acute coronary syndrome (n = 1,126, 46% women) were enrolled. Two cardiologists independently adjudicated the diagnosis of myocardial infarction by using a high sensitivity troponin I assay with sex-specific diagnostic thresholds (men 34 ng/l, women 16 ng/l) and compared with current practice in which a contemporary assay (50 ng/l, single threshold) is commonly used to guide care. It was found that the use of a high sensitivity cardiac troponin I assay with sex-specific diagnostic thresholds may double the diagnosis of myocardial infarction in women, such that the proportion of men and women diagnosed as having myocardial infarction would be similar. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

Association between asthma and risk of developing obstructive sleep apnea. JAMA 2015; 313:156–64.

Patients presenting for surgery with obstructive sleep apnea (OSA) have an increased risk of postoperative complications. Asthma is a risk factor for surgical patients. OSA is more common among patients with asthma, but whether asthma is associated with the development of OSA is unknown. This population-based prospective epidemiologic study recruited patients randomly selected among Wisconsin state employees to undergo polysomnographic studies over a 4-yr period, during which asthma and covariates were assessed. Twenty-two of 81 participants (27% [95% CI, 17–37%]) with asthma experienced an incident of OSA over their first observed 4-yr follow-up interval compared with 75 of 466 participants (16% [95% CI, 13–19%]) without asthma. Asthma was associated with an increased risk of new-onset OSA, which suggests that OSA should be investigated in patients with asthma presenting for surgery. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

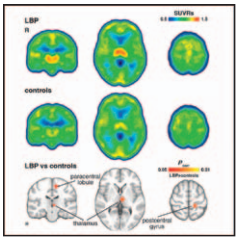
Protocolized sedation *vs* usual care in pediatric patients mechanically ventilated for acute respiratory failure: A randomized clinical trial. JAMA 2015; 313:379–89.

Protocolized sedation improves clinical outcomes in critically ill adults, but its effect in children is unknown. This multicenter, cluster randomized trial included 2,449 children mechanically ventilated for acute respiratory failure. Intervention consisted of a nurse-implemented protocol that included targeted sedation, arousal assessments, extubation readiness testing, sedation adjustment every 8 h, and sedation weaning, all of which was compared with usual care. The primary outcome was duration of mechanical ventilation. No significant difference was found between the two groups in the duration of mechanical ventilation. A complex relationship among wakefulness, pain, and agitation may account for the difference in results of goal-directed sedation in adult intensive care unit patients. *(Summary: J. Mantz. Image: J.P. Rathmell, with consent.)*



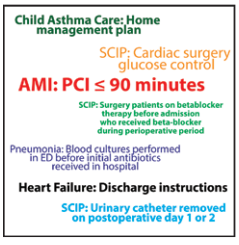
Comparison of the Full Outline of UnResponsiveness score and the Glasgow Coma Scale in predicting mortality in critically ill patients. Crit Care Med 2015; 43:439–44.

Impaired consciousness has been incorporated in prediction models that are used in the intensive care unit (ICU). The Glasgow Coma Scale has value but is incomplete and cannot be accurately assessed in intubated patients. The Full Outline of UnResponsiveness (FOUR) score may be a better predictor of mortality in critically ill patients. In this prospective observational study, including 1,695 consecutive ICU patients, FOUR and Glasgow Coma Scale scores were recorded within 1 h after admission and linked to mortality. It was found that the FOUR score might be a better prognostic tool for ICU mortality than the Glasgow Coma Scale with regard to critically ill patients. This is most likely a result of incorporating brainstem reflexes and respiration. *(Summary: J. Mantz. Illustration: J.P. Rathmell.)*



Evidence for brain glial activation in chronic pain patients. Brain 2015; 138:604–15.

For more than a decade basic scientists have studied the roles of glial cells in modulating pain. The ability to study glial activation in living humans has not been possible, until recently. Loggia *et al.* now report that the state of microglial activation in the brains of back pain patients can be followed noninvasively using ^{11}C-PBR28, a ligand for the microglial transporter protein TSPO. The study was designed using nine pairs of patients with one patient in each pair suffering from chronic low back pain. Remarkably, they found increased uptake of the tracer in brain regions such as the thalamus and somatosensory cortex. Additional correlations were made between the levels of thalamic uptake and pain levels as well as circulating proinflammatory cytokines such as IL-1β. Though this was a small study in need of replication, the results suggest that we may soon be able to study the relationship of glial activity to various dimensions of pain in patients. *(Summary: J.D. Clark. Image: ©Marco L. Loggia, Massachusetts General Hospital; figure 2 from the article, used with permission of Oxford University Press.)*



Creating a high-reliability health care system: Improving performance on core processes of care at Johns Hopkins Medicine. Acad Med 2015; 90:165–72.

Pronovost *et al.* have provided anesthesiologists food for thought with their quality improvement patient care goals, specifically those that are intimately involved with perianesthesia patient care. They detail the process of establishing a quality improvement initiative in the Johns Hopkins Health system. Seven process improvement goals are targeted, including: treatment of acute myocardial infarction, heart failure, pneumonia, cardiac surgery glucose control, β-blocker therapy in the perioperative period, urinary catheter removal within the first 2 days postsurgery, and home management planning. The authors demonstrated improved compliance with these monitored therapies. The authors postulated that greater compliance with therapeutic actions that have been shown to improve patient outcome is a result of a raised level of acceptance and accountability with regard to quality improvement initiatives. *(Summary: A.J. Schwartz. Image: J.P. Rathmell.)*