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Perioperative Medicine

Medical and financial risks associated with surgery in the elderly obese. *Ann Surg* 2012; 256:79–86

This chart review evaluated the commonly held belief that obese surgical patients are at increased risk for postoperative morbidity and mortality and require increased health-care system resources. The authors collected baseline information including body mass index (BMI), comorbidity, and postoperative data and costs from the medical records and Medicare claims database of 15,914 elderly patients undergoing hip replacement, knee replacement, colectomy, or thoracotomy across 47 hospitals. After matching patients by comorbidities, demographics, procedure, and hospital, the authors compared mortality, complications, length of stay, hospital costs, and readmission rates among patients with BMI of 35 or more kg/m² and BMI 20–30 kg/m². The authors observed that despite controlling for comorbidities, moderate to severely obese patients demonstrated an increased rate of complications and higher provider costs, including a 60% increased risk

of wound infections, 40% increase in respiratory events, 40% increase in readmission, and 10% increase in costs (fig. 1). These data are in contrast to previous literature that failed to demonstrate increased complications in obese patients undergoing noncardiac surgery. They also indicate that current payer-driven quality assessment initiatives may need to incorporate obesity as a risk adjustment variable.

Cognitive trajectories after postoperative delirium. *N Engl J Med* 2012; 367:30–9

Postoperative delirium and cognitive decline are garnering increased attention as the surgical population ages. In this prospective study of 225 patients undergoing coronary artery bypass grafting or valve replacement surgery, the authors performed detailed preoperative, postoperative, and long-term cognitive function and delirium assessments using validated instruments. Patients with delirium had significantly lower postoperative cognitive function. Patients exhibiting postoperative delirium maintained significant cognitive deficits up to 1 yr after surgery compared with patients who did not have delirium. However, after adjustment for baseline differences,

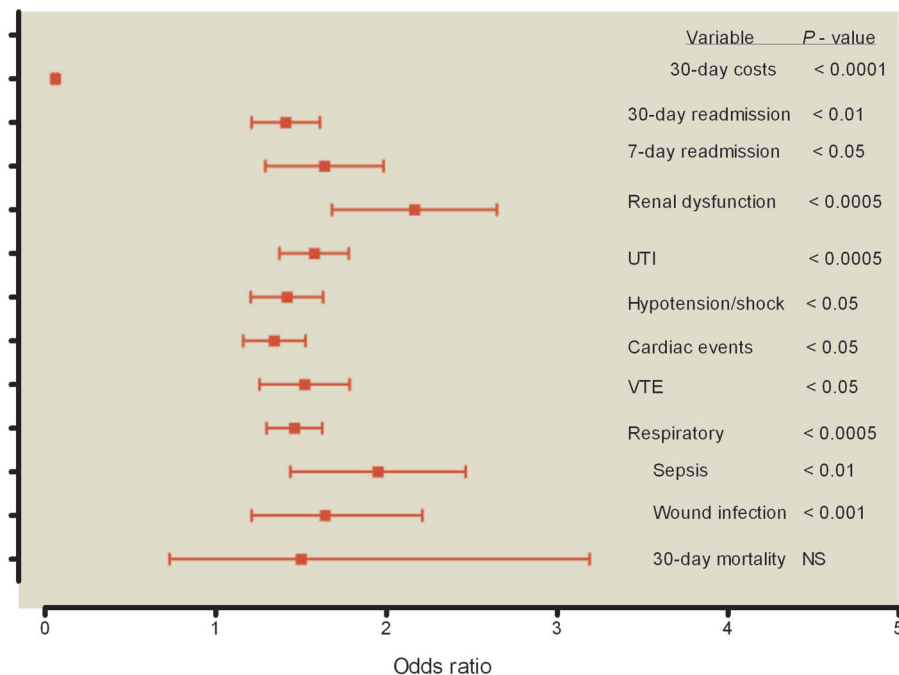


Fig. 1. Moderate and severely obese patients had a higher risk of poor surgical outcomes compared with patients with body mass index less than 30 kg/m². UTI = urinary tract infection; VTE = venous thromboembolism.

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these differences were only significant 1 month after surgery ($P < 0.001$). Patients demonstrating postoperative delirium had poorer baseline preoperative cognitive function. It remains unclear whether patients with delirium have underlying abnormalities associated with long-term cognitive dysfunction, or whether the delirium is causally related to long-term outcomes. In either case, these data suggest that efforts to predict and prevent postoperative delirium may have significant long-term cognitive impact.

Association between postoperative troponin levels and 30-day mortality among patients undergoing noncardiac surgery. *JAMA* 2012; 307:2295–304

Postoperative elevation of blood troponin levels is known to be a strong predictor of long-term mortality in high-risk cardiovascular patients undergoing noncardiac surgery. A large prospective, international cohort study of patients ($n = 15,133$) undergoing noncardiac surgery measured troponin T (TnT) 6–12 h after surgery and on days 1, 2, and 3 after surgery. The fourth generation TnT peak within the first 3 postoperative days strongly predicted 30-day postoperative mortality (net reclassification improvement was 25%; $P < 0.001$). TnT monitoring postoperatively may help to stratify patients' risk of mortality, but whether specific interventions can change patients' risk of death based on an increased measurement of troponin after surgery remains unproven.

The benefits and harms of intravenous thrombolysis with recombinant tissue plasminogen activator within 6 h of acute ischemic stroke (the third international stroke trial) [IST-3]: A randomised controlled trial. *Lancet* 2012; 379:2352–63

Thrombolysis is a cornerstone of the treatment of acute ischemic stroke within 4 or 5 h from the onset of symptoms in patients younger than 80 years of age. This international, randomized, multicenter, placebo-controlled trial compared the effects of 0.9 mg/kg IV recombinant tissue plasminogen activator on 6-month survival and independence status in patients ($n = 3,035$) with clinically defined acute stroke. These data suggest that for the type of patients recruited (3/4 of the patients were enrolled after 3 h, and half of them were older than 80 yr of age), recombinant tissue plasminogen activator improves functional outcomes at 6 months. These results support future trials testing thrombolysis in patients with acute ischemic stroke enrolled after 4 or 5 h.

Critical Care Medicine

Hydroxyethyl starch 130/0.42 versus Ringer's acetate in severe sepsis. *N Engl J Med* 2012; 367:124–34

There has been much debate in recent years regarding which type of fluid is optimal in critically ill patients with sepsis. Colloid solutions have been recommended for their ability to restore hemodynamic stability rapidly and effectively and for being less likely to cause edema than crystalloid solutions, because lesser amounts are required to meet the same hemodynamic goals. However, some hydroxyethyl starch (HES) solutions have been associated with an increased risk of acute kidney failure in patients with severe sepsis. A multicenter, parallel-group, blinded trial was conducted to compare 6% HES 130/0.4 with Ringer's acetate for fluid resuscitation in 798 patients with severe sepsis. The relative risk of 90-day mortality and the need for renal replacement therapy were significantly higher in the HES group ($P = 0.03$ and 0.04 , respectively) compared with the Ringer's acetate group. These results raise further concerns about the use of HES solutions in these patients, confirming data from the earlier VISEP study that compared 10% HES 200/0.5 with Ringer's lactate, although the recent CRYSTMAS study reported no differences in either mortality or development of acute renal failure in patients treated with 6% HES 130/0.4 or normal saline. The results of the 7,000-patient CHEST trial comparing 6% HES (130/0.4) with normal saline in critically ill patients with sepsis are now eagerly awaited.

Acute respiratory distress syndrome: The Berlin Definition. *JAMA* 2012; 307:2526–33

The acute respiratory distress syndrome (ARDS) was first described in 1967, but it took until 1994 for the American-European Consensus Conference to establish a standard definition. Although this definition is widely used, concerns have been raised regarding its reliability and validity. An international expert panel was thus convened by the European Society of Intensive Care Medicine to develop a new definition addressing some of the limitations of the 1994 version. The key changes in the new definition compared with the old are that the acute lung injury entity has been removed; ARDS has been divided into three grades of severity (mild, moderate, severe) based on the $\text{PaO}_2/\text{FiO}_2$ ratio; "acute" has now been defined as 1 week or less; the wedge pressure criterion has been removed; and the $\text{PaO}_2/\text{FiO}_2$ measure of oxygenation has been changed to include a specific minimum amount of positive end-expiratory pressure. The validated of the new definition was evaluated using a database of 4,188 patients with ARDS, and small refinements,

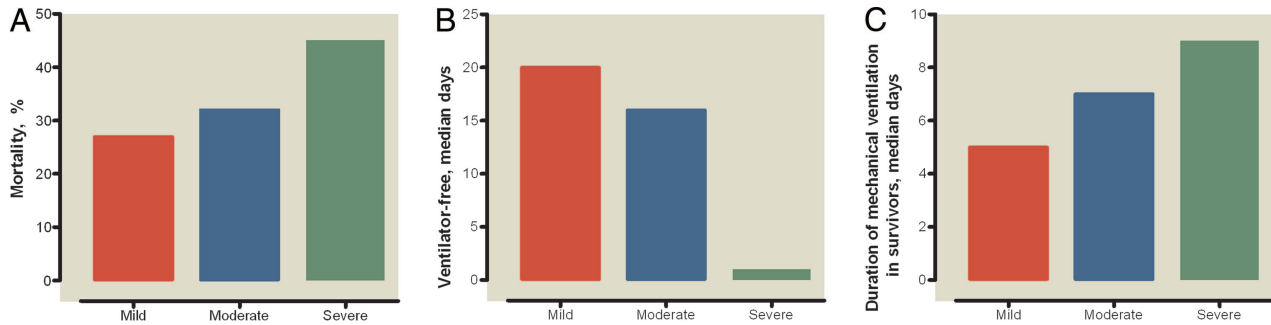


Fig. 2. Increasing severity of disease associated with the mild, moderate, and severe classifications in the new categories of the acute respiratory distress syndrome Berlin definition. Comparisons of mortality (A), ventilator-free days (B), and duration of mechanical ventilation (C) in survivors across categories were all statistically significant ($P < 0.001$).

notably to the criteria for severe ARDS, were made. The final Berlin Definition had an area under the receiver operating characteristic curve of 0.58 (95% CI: 0.56 to 0.59) compared with the AECC definition (area under the receiver operating characteristic curve: 0.54; 95% CI: 0.52 to 0.55 for predicting mortality ($P < 0.001$). Increasing severity from mild, moderate, to severe ARDS was associated with increased mortality and increased duration of mechanical ventilation in survivors (fig. 2).

Pain Medicine

Corticostriatal functional connectivity predicts transition to chronic back pain. *Nat Neurosci* 2012 Jul 1; Epub ahead of print. doi:10.1038/nn.3153

Chronic back pain is a major public health issue with a significant economic impact on the healthcare system. The mechanisms of brain reorganization that lead from acute to chronic pain states remain unknown. In this longitudinal brain imaging study, patients ($n = 39$) with subacute back pain for 4–16 weeks were followed up to 1 yr. These data show that greater functional connectivity between prefrontal cortex and nucleus accumbens initially predicted pain persistence. Therefore, the corticostriatal circuitry may play a causal role leading to the transition from acute to chronic back pain. By better understanding these mechanisms, novel targets may be elucidated to prevent the transition from acute to chronic pain.

Vital signs: Risk for overdose from methadone used for pain relief: United States, 1999–2010. Morbidity and Mortality Weekly Report, July 3, 2012; vol. 61

The Centers for Disease Control reported that between 1999 and 2009, the rate of fatal overdoses involving methadone increased more than 5-fold as its prescribed use for treatment of pain increased. Methadone was involved in 31.4% of opioid-related deaths in 13 states, more than any other opioid (fig. 3). This is explained by the inappropriate use of methadone for both acute injuries and long-term analgesia for common chronic pain in which the benefit of opioid pain relievers remains unproven. Healthcare providers prescribing methadone should have substantial experience in its use and should comply with the Consensus Guidelines for its prescription.

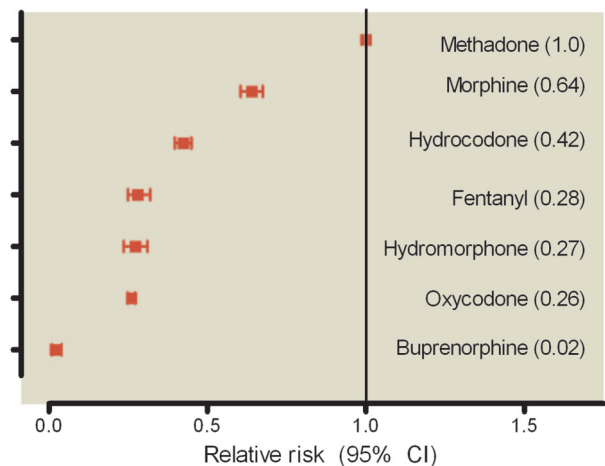


Fig. 3. Methadone was responsible for the most drug-related deaths compared with any other opioid in 2009.