
Chronic postsurgical pain occurs in 12% of surgical populations and is a high priority for perioperative research. This systematic review synthesized the evidence linking lidocaine infusions and chronic postsurgical pain. The authors included trials that randomized adults without baseline pain to perioperative lidocaine infusion or placebo. The primary outcome was the presence of procedure-related pain at 3 months or longer after surgery. The authors included six trials with 5,420 patients from four countries. Perioperative lidocaine infusions significantly reduced the primary outcome (odds ratio, 0.29; 95% CI, 0.18 to 0.48). The difference in intensity of chronic postsurgical pain assessed by the short-form McGill Pain Questionnaire was not statistically significant (weighted mean difference, 21.55; 95% CI, 23.16 to 0.06). The authors identified trial design limitations and publication and other biases. Each study reported that no lidocaine-related adverse events occurred, but systematic safety surveillance strategies were absent. The authors concluded that current limited clinical trial data and biological plausibility support lidocaine infusions to prevent the development of chronic postsurgical pain without full assurances as to its safety. (Article Selection: J. David Clark. Image: A. Pisansky.)

Take home message: Limited clinical trial data support lidocaine infusions to prevent the development of chronic postsurgical pain but safety questions remain.


American Surgical Association leadership appointed a task force to address issues related to equity, diversity, and inclusion within academic surgery. Nine work groups reviewed the current literature, performed primary qualitative interviews, and distilled available guidelines and published primary source materials. The resulting handbook, Ensuring Equity, Diversity, and Inclusion in Academic Surgery, identifies challenges and develops a set of solutions and benchmarks to aid the academic surgical community in achieving diversity goals. The task force concluded that surgeons as a group must identify areas for improvement and work to correct past deficiencies. They note that this task requires the honest and ongoing identification and correction of implicit and explicit biases. Increasing diversity in surgical departments and residencies will improve patient care and enhance productivity. (Article Selection: Beatrice Beck-Schimmer. Image: ©ThinkStock.)

Take home message: Identification and correction of biases can lead to increased diversity, equity, and inclusion.


The safety of discharging adult patients recovering from critical illness directly home from the intensive care unit (ICU) is unknown. This retrospective population-based cohort study of adult ICU patients compared healthcare utilization and clinical outcomes for patients discharged directly home from the ICU with those of patients discharged home via the hospital ward. The primary outcome was readmission to the hospital within 30 days of hospital discharge. Of 6,732 patients included in the study, 922 (14%) were discharged directly home. In the 1,632-patient propensity score matched cohort, patients discharged directly home had median ICU stays of 3 days but significantly shorter length of hospital stay (median, 3.3 days vs. 9.2 days; P < 0.001). There were no significant differences between patients discharged directly home or home via the hospital ward for readmission to the hospital within 30 days of hospital discharge (10% [n = 81] vs. 11% [n = 92]; HR, 0.88; 95% CI, 0.64 to 1.20). The authors concluded that the common practice of discharging select adult patients directly home from the ICU is not associated with increased health care utilization or increased mortality. (Article Selection: Martin J. London. Image: ©ThinkStock.)

Take home message: Discharge of select patients directly to home from the ICU may not be associated with a higher risk of hospital readmission or mortality.

Studies have suggested that N-methyl-D-aspartate receptor antagonists like nitrous oxide may help reduce tinnitus. This randomized, placebo-controlled crossover trial investigated whether nitrous oxide can reduce tinnitus. Adults with tinnitus of at least 6 months’ duration (n = 40) were randomized to receive either placebo or nitrous oxide, then attend two interventional sessions at least 14 days apart. The sessions lasted for 40 min; the placebo session consisted of 50% nitrogen and 50% oxygen, and the treatment session consisted of 50% nitrous oxide and 50% oxygen. The authors assessed tinnitus before and after intervention, with the change in the Tinnitus Functional Index (TFI) as the primary outcome. The TFI after intervention was a mean (SD) of 1.8 (8.8) points lower in the placebo arm and a mean (SD) of 2.5 (11.0) points lower in the nitrous oxide arm. The within-participant mean difference in the change in the TFI of the placebo arm compared with the nitrous oxide arm was −1.1 points (95% CI, −5.6 to 3.4 points). The authors concluded that nitrous oxide was no more effective than placebo for the treatment of tinnitus. (Article Selection: Deborah J. Culley. Image: J. P. Rathmell.)

Take home message: Nitrous oxide appears to be ineffective for the treatment of tinnitus.


A previous publication demonstrated that a restrictive transfusion strategy in high-risk patients undergoing cardiac surgery was noninferior to a liberal strategy for the composite outcome of death from any cause, myocardial infarction, stroke, or new-onset renal failure by hospital discharge or 28 days after surgery in 5,243 patients. This publication reports on the same outcomes in this patient population 6 months after surgery. The primary composite outcome had occurred in 402 patients (17.4%) in the restrictive group and in 402 patients (17.1%) in the liberal group (absolute risk difference before rounding, 0.22 percentage points; 95% CI, −1.96 to 2.39; odds ratio, 1.02; 95% CI, 0.87 to 1.18; P = 0.006 for noninferiority). The authors concluded that a restrictive red-cell transfusion strategy was noninferior to a liberal strategy in high-risk patients undergoing cardiac surgery in terms of all-cause mortality, myocardial infarction, stroke, or new-onset renal failure at 6 months after surgery. (Article Selection: Martin J. London. Image: J. P. Rathmell.)

Take home message: Restrictive transfusion strategies in patients undergoing cardiac surgery may be noninferior to liberal transfusion strategies in the first 6 months after surgery.


The European Society of Cardiology, American College of Cardiology Foundation, American Heart Association, and the World Heart Federation have published a revised definition of myocardial infarction. The term myocardial injury should be used when there is evidence of elevated cardiac troponin values (cTn) with at least one value above the 99th percentile of the upper reference limit (URL). The myocardial injury is considered acute if there is a rise and/or fall of cTn values. The term acute myocardial infarction should be used when there is acute myocardial injury with clinical evidence of acute myocardial ischemia and detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL and at least one of the following: symptoms of myocardial ischemia; new ischemic electrocardiographic changes; development of pathological Q waves; imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with ischemia; or identification of a coronary thrombus by angiography or autopsy. The definition also includes criteria for coronary procedure-related myocardial infarction and for prior or silent/unrecognized myocardial infarction. (Article Selection: Martin J. London. Image: J. P. Rathmell.)

Take home message: There is a revised definition of myocardial infarction from the European Society of Cardiology, American College of Cardiology Foundation, American Heart Association, and the World Heart Federation.

Persistent opioid use after wisdom tooth extraction. JAMA 2018; 320:504–6.

Opioid-naive patients are at risk for persistent opioid use after elective surgery, but the risk following dental procedures is unknown. This study investigated the association of filled perioperative opioid prescriptions with persistent use of prescription opioid medications following wisdom tooth extraction. The authors used a dental insurance claims database to identify filled prescriptions. The exposure was ≥1 filled perioperative opioid prescription and the primary outcome was persistent opioid use (≥1 opioid prescription filled during postprocedure days 4 to 90 and 91 to 365). Among 70,942 included patients, 56,686 patients filled a perioperative opioid prescription. Hydrocodone was the most common (70.3%), followed by oxycodone (24.3%). Patients who filled an opioid prescription were more often younger and female with higher rates of risk factors like chronic pain, depression, and anxiety. With a filled opioid prescription persistent opioid use occurred at an adjusted rate of 13 per 1,000 patients (95% CI, 3 to 7) without a filled prescription. The authors noted that persistent use was not explained by patient characteristics or tooth impaction alone. (Article Selection: J. David Clark. Image: ©ThinkStock.)

Take home message: Patients who fill an opioid prescription following wisdom tooth extraction may have a higher rate of persistent opioid use.

Quality of life in pediatric patients who receive surgery as neonates for complex congenital conditions is seldom explored longitudinally. This prospective observational study assessed postoperative quality of life for patients with congenital diaphragmatic hernia, esophageal atresia/tracheoesophageal fistula, Hirschsprung disease, gastroschisis, omphalocele, and necrotizing enterocolitis. The authors collected institutional outcomes registry data from 241 patients. Aggregate physical, psychosocial, and overall quality of life scores were determined for each diagnosis. Physical scores trended up for all diagnoses except congenital diaphragmatic hernia and necrotizing enterocolitis beyond age 10. Psychosocial scores trended up for all diagnoses except necrotizing enterocolitis and esophageal atresia/tracheoesophageal fistula beyond age 10. Beyond age 12, quality of life is significantly impaired in necrotizing enterocolitis, moderately impaired in omphalocele and esophageal atresia/tracheoesophageal fistula, and within normal range for congenital diaphragmatic hernia, Hirschsprung disease, and gastroschisis patients. The authors concluded that variation exists in long-term quality of life scores after neonatal surgery for complex disease. These data may be helpful in prenatal and perioperative discussions with families. (Article Selection: Beatrice Beck-Schimmer. Image: ©ThinkStock.)

Take home message: Quantifying long-term quality of life measures in infants undergoing surgery for complex congenital conditions may aid in prenatal and perioperative counseling.

Global surgical, obstetric, and anesthetic task shifting: A systematic literature review. Surgery 2018; 164:553–8.

Task shifting is commonly used to expand the global surgical workforce, which is experiencing severe shortages. This systematic review examined the use of surgical, obstetric, and anesthetic task shifting worldwide. The authors extracted data for types of tasks, training, and levels of supervision, and compared these across regions and countries’ income groups. They examined 55 relevant studies that included surgery data for 52 countries and anesthesia data for 147 countries. Surgical task shifting was documented in 19 countries and anesthetic task shifting in 119 countries. This practice was observed across all World Bank income groups. No nonphysician clinicians performed unsupervised surgical procedures in high-income countries. Independent anesthesia care by associate clinicians occurred in 3 of 19 countries with data. In low-income countries, associate clinicians performed surgical procedures independently in two of three countries and independent anesthesia care in 17 of 17 countries with data. The authors concluded that associate clinicians are ubiquitous among the global surgical workforce and should be considered in plans to scale up the surgical workforce. (Article Selection: Beatrice Beck-Schimmer. Image: ©ThinkStock.)

Take home message: Associate clinicians are ubiquitous in the global surgical workforce but are less common in high-income countries.


Drug-coated balloons are a novel therapeutic strategy for the treatment of coronary artery disease. However, their safety and efficacy is poorly defined in comparison with drug-eluting stents. BASKET-SMALL 2 was a multicenter, open-label, randomized noninferiority trial. The authors randomized 758 patients with de novo lesions (less than 3 mm in diameter) in coronary vessels and an indication for percutaneous coronary intervention. Patients received either angioplasty with drug-coated balloon or implantation of a second-generation drug-eluting stent. The primary objective was to show noninferiority of balloons versus stents with regard to major adverse cardiac events (cardiac death, myocardial infarction, and target-vessel revascularization) after 1 yr. The noninferiority margin was an absolute difference of 4% in cardiac events. The authors found drug-coated balloons to be noninferior to drug-eluting stents because the 95% CI of the absolute difference in major cardiac events was below the predefined margin (−3.83% to 3.93%, \(P = 0.0217\)). After 12 months, the proportions of major cardiac events were also similar in both groups (7.5% for the balloon group vs. 7.3% for the stent group; hazard ratio, 0.97 [95% CI, 0.58 to 1.64], \(P = 0.9180\)). (Article Selection: Martin J. London. Image: J. P. Rathmell.)

Take home message: Angioplasty with drug-coated stents may be noninferior to drug-eluting stents for the treatment of small lesion (less than 3mm) coronary artery disease.


Misuse of prescription opioids, opioid addiction, and overdose underscore the urgent need for developing effective addiction-free medications for treating severe pain. Mu opioid peptide receptor agonists provide very effective pain relief. However, severe side effects limit their use in the clinical setting. Agonists of the nociceptin/orphanin FQ peptide receptor have been shown to modulate the antinociceptive and reinforcing effects of mu opioid peptide receptor agonists. The authors report the discovery and development of a bifunctional nociceptin/orphanin FQ peptide/mu opioid peptide receptor agonist, AT-121, which has partial agonist activity at both nociceptin/orphanin FQ peptide and mu opioid peptide receptors. AT-121 suppressed oxycodone’s reinforcing effects and exerted morphine-like analgesic effects in nonhuman primates. AT-121 treatment did not induce side effects commonly associated with opioids, such as respiratory depression, abuse potential, opioid-induced hyperalgesia, and physical dependence. The authors conclude that their results in nonhuman primates suggest that bifunctional nociceptin/orphanin FQ peptide/mu opioid peptide agonists with the appropriate balance of nociceptin/orphanin FQ peptide and mu opioid peptide agonist activity may provide a dual therapeutic action for safe and effective pain relief and treatment of opioid abuse. (Article Selection: J. David Clark. Image: ©ThinkStock.)

Take home message: In nonhuman primates, a bifunctional nociceptin/orphanin FQ peptide and mu opioid peptide agonist may provide for safe and effective pain relief and treatment for opioid abuse.
Impaired efferocytosis and neutrophil extracellular trap clearance by macrophages in ARDS. Eur Respir J 2018; 52:1702590.

Exaggerated release of neutrophil extracellular traps along with decreased clearance may contribute to sustained inflammation in acute respiratory distress syndrome (ARDS). This study investigated neutrophil and neutrophil extracellular trap clearance by macrophages from control and ARDS patients. Metformin and neutralizing antibody against high-mobility group box 1 were applied to improve efferocytosis and neutrophil extracellular trap clearance. Conversely, neutrophil extracellular trap formation was significantly enhanced in ARDS patients. Exposure of neutrophils to ARDS lavage fluid promoted neutrophil extracellular trap production, while control lavage fluid had no effect. Macrophage engulfment of neutrophil extracellular traps and apoptotic neutrophils was diminished in ARDS patients. Notably, activation of adenosine monophosphate-activated protein kinase in macrophages or neutralization of high-mobility group box 1 in lavage fluid improved efferocytosis and neutrophil extracellular trap clearance. The authors concluded that restoring adenosine monophosphate-activated protein kinase activity with metformin or specific neutralization of high-mobility group box 1 in lavage fluid are promising therapeutic strategies to decrease sustained lung inflammation during ARDS. (Article Selection: Beatrice Beck-Schimmer. Image: ©ThinkStock.)

Take home message: Restoring adenosine monophosphate-activated protein kinase activity with metformin or specific neutralization of high-mobility group box 1 in lavage fluid are promising therapeutic strategies to decrease lung inflammation in ARDS.


Autologous hepatocyte transplantation and gene therapy may be an alternative to liver transplantation in the setting of metabolic liver disease. This study evaluated ex vivo gene therapy followed by transplantation of single-cell or spheroid hepatocytes. The authors isolated and labeled pig and mouse hepatocytes and returned them to the liver as single cells or spheroids. Animals received portal vein infusion of autologous hepatocytes after ex vivo gene delivery. Differences in engraftment and expansion of ex vivo single-cell or spheroid hepatocytes were followed through histologic analysis and animals’ ability to thrive off 2-(2-nitro-4-trifluoromethylbenzoyl)-1,3-cyclohexanedione. Positron emission tomography–computed tomography imaging showed spheroid hepatocytes with increased heterogeneity in biodistribution as compared with single cells, which spread more uniformly throughout the liver. Animals receiving spheroids experienced higher mean changes in portal pressure than animals receiving single cells ($P < 0.01$). The authors concluded that ex vivo gene correction of autologous hepatocytes in fumarylacetoacetate hydrolase–deficient pigs can be performed using hepatocyte spheroids or single-cell hepatocytes, with spheroids showing a more heterogeneous distribution within the liver and higher risks for portal vein thrombosis and increased portal pressures. (Article Selection: Beatrice Beck-Schimmer. Image: ©ThinkStock.)

Take home message: This study suggests that engraftment of ex vivo single cell hepatocytes may be associated with a more uniform spread of cells throughout the liver and lower portal pressure when compared to engraftment of spheroid hepatocytes.