

923 Pain Management Modalities after Total Knee Arthroplasty: A Network Meta-analysis of 170 Randomized Controlled Trials

A network meta-analysis (NMA) was conducted to evaluate and rank available interventional analgesic modalities for total knee arthroplasty (TKA) in terms of efficacy and safety. NMA extends the concept of traditional meta-analysis to produce pairwise comparisons and relative treatment effects across a range of interventions through direct and indirect comparisons. The NMA included 170 randomized controlled trials (12,530 patients) that evaluated pain management effectiveness, quality of recovery, and rehabilitation profile after TKA using any of the following interventional techniques: neuraxial analgesia; peripheral nerve blocks; periarticular local anesthetic infiltration; auricular acupressure; intravenous patient-control analgesia; or placebo, including systematic opioid not given *via* patient-control analgesia. Studies that combined interventions from different categories were excluded. The optimal modality, based on balance among lowest pain scores, lowest opioid consumption, and largest range of movement in the first 72 h after surgery, was the combination of femoral and sciatic nerves block. See the accompanying Editorial View on [page 768](#). (Summary: M. J. Avram. Image: A. Johnson, Vivo Visuals.)



938 A Prospective Study of Chronic Pain after Thoracic Surgery

The incidence of chronic pain 6 months after thoracotomy has been reported to be 47%. The hypothesis that chronic pain after thoracic surgery is related to not only surgery- and anesthesia-related factors but also psychosocial measures assessed before the surgery was tested in 30 patients undergoing thoracotomy and 69 undergoing video-assisted thoracoscopic surgery (thoracoscopy). There was no difference in either the incidence or the severity of chronic pain 6 months after thoracic surgery in patients undergoing thoracotomy or thoracoscopy. The only covariate associated with the chronic pain 6 months after thoracic surgery in both frequentist and Bayesian multivariate models was higher severity average acute pain during the first 3 days after surgery. The area under the curve (c-statistic) of the frequentist multivariate model was 0.73. Preoperative psychologic factors were not associated with development of chronic pain. (Summary: M. J. Avram. Image: J. P. Rathmell.)



890 Nebulization of Antiinfective Agents in Invasively Mechanically Ventilated Adults: A Systematic Review and Meta-analysis

The hypothesis that nebulized antibiotics are safe and effective for the treatment of nosocomial respiratory infections in invasively mechanically ventilated adults was tested in this systematic review and meta-analysis of six randomized controlled trials and five observational studies involving 826 patients. Patients with resistant pathogens-related infections might derive greater benefit from nebulized antibiotic therapy. Its use, without concomitant intravenous administration of the drug, may reduce nephrotoxicity associated with systemic colistin or aminoglycosides. Administration of nebulized antibiotics seems to be associated with a higher risk of respiratory complications, particularly in severely hypoxemic patients. Despite increasingly common administration of nebulized antibiotics, the present study found limited available evidence supporting its use and the authors called for larger randomized controlled trials evaluating the effects of nebulized antibiotics that include more homogeneous populations, standardized drug delivery, and predetermined effectiveness and safety outcomes. (Summary: M. J. Avram. Image: J. P. Rathmell.)



787 Long-term Effects of Remote Ischemic Preconditioning on Kidney Function in High-risk Cardiac Surgery Patients: Follow-up Results from the RenalRIP Trial

A recent multicenter, randomized controlled trial found that remote ischemic preconditioning (RIPC) in high-risk cardiac surgery patients significantly reduced the rate of acute kidney injury (AKI) after 30 days, and the need for renal replacement therapy. The present follow-up study of 240 patients determined the effects of RIPC on 90-day major adverse kidney events (MAKE₉₀), a composite secondary endpoint consisting of all-cause mortality, the receipt of renal replacement therapy, and persistent renal dysfunction without dialysis. RIPC reduced the incidence of MAKE₉₀ from 25% in the Sham-RIPC group to 14% in the RIPC group without affecting all-cause mortality. It significantly improved renal function by reducing persistent renal dysfunction and the need for renal replacement therapy at day 90. In addition, RIPC both reduced the severity of AKI and enhanced renal recovery in those patients who developed AKI. See the accompanying Editorial View on [page 763](#). (Summary: M. J. Avram. Image: J. P. Rathmell.)



822 Clinical Effectiveness and Safety of Intraoperative Methadone in Patients Undergoing Posterior Spinal Fusion Surgery: A Randomized, Double-blinded Controlled Trial

Patients undergoing posterior spinal fusion surgery often experience severe postoperative pain. The hypothesis that posterior spinal fusion surgery patients receiving methadone 0.2mg/kg at the start of surgery would have reduced analgesic requirements, lower pain scores, and improved quality of recovery during the first 3 postoperative days than patients receiving hydromorphone 2.0mg at the conclusion of the procedure was tested in a randomized, double-blinded, placebo-controlled trial of 155 patients. Postoperative hydromorphone patient-controlled analgesia requirements were less in the methadone group than in the hydromorphone group not only on postoperative day 1 (4.6 vs.

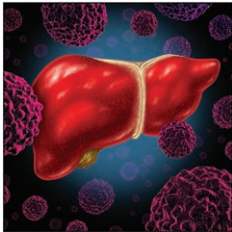
9.9mg, respectively) but also on postoperative days 2 and 3. Patients in the methadone group also required less oral opioid medication, reported lower pain scores, and were more satisfied with pain management during the first 3 postoperative days than patients receiving intraoperative hydromorphone. (Summary: M. J. Avram. Image: J. P. Rathmell.)



799 Lack of Association between Preoperative Statin Use and Respiratory and Neurologic Complications after Cardiac Surgery

The pleiotropic effects of statins, including antioxidant properties, normalization of endothelial function, and attenuation of inflammation and reperfusion injury, may provide direct organ protection and contribute to improved postoperative outcomes. The primary hypothesis that adult cardiac surgical patients who use statins chronically have a reduced incidence of pneumonia, prolonged ventilation, and all-cause in-hospital mortality than those who do not was tested in 6,642 patients: 3,321 nonstatin patients exactly matched to 3,321 statin patients on type and year of surgery and propensity score matched on a total of 36 potential confounding variables. Secondary outcomes evaluated included serious neurologic outcomes. These data provided no evidence that preoperative use of statins reduced in-hospital

mortality, major respiratory complications, or serious neurologic complications, possibly because these outcomes are overwhelmingly determined by perioperative risk factors other than inflammation and endothelial injury. (Summary: M. J. Avram. Image: J. P. Rathmell.)



868 Lidocaine Induces Apoptosis and Suppresses Tumor Growth in Human Hepatocellular Carcinoma Cells *In Vitro* and in a Xenograft Model *In Vivo*

Lidocaine may exert antitumor activity by suppressing cell proliferation, inducing apoptosis, and inhibiting migration. The *in vitro* growth of human hepatocellular carcinoma HepG2 cells treated with lidocaine alone was suppressed in a dose- and time-dependent manner. Lidocaine (at the relatively high concentration of 5mM) arrested cells in the G0/G1 phase of the cell cycle and induced apoptosis. Lidocaine also enhanced cisplatin cytotoxicity by increasing cisplatin-induced apoptosis in HepG2 cells. In male athymic nude mice, either lidocaine (30mg/kg intraperitoneally, twice a week) or cisplatin (3mg/kg intraperitoneally, once a week) treatment alone markedly suppressed HepG2 xenograft tumor growth compared with the control. Tumor weights were markedly reduced in mice treated with lidocaine

combined with cisplatin compared to mice treated with lidocaine or cisplatin alone. None of the mice experienced significant lidocaine toxicity. (Summary: M. J. Avram. Image: © ThinkStock.)



780 On the Road to Professionalism (Special Article)

Many observers have concluded that there is a crisis of professionalism in the practice of medicine. In an essay adapted from the E. A. Rovenstine lecture he delivered at the 2016 meeting of the American Society of Anesthesiologists, David H. Chestnut, M.D., affirms professionalism as a core competency that requires character and lifelong learning, commitment, and practice. He suggests that physicians need some help and encouragement along the way. The personal attributes he considers to be important to the development and maintenance of physician professionalism and on which he elaborates include what he considers the single most desirable, humility, as well as servant leadership, self-awareness, kindness, altruism, attention to personal well-being, responsibility and concern for patient safety, self-regulation, and honesty and integrity. He asserts that physicians should help shape the culture of professionalism in their practice environment. (Summary: M. J. Avram. Image: American Society of Anesthesiologists.)