ANESTHESIOLOGY

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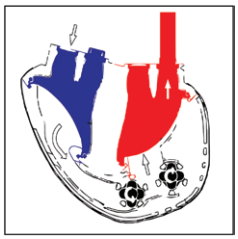

First clinical use of a bioprosthetic total artificial heart: Report of two cases. Lancet 2015; 386:1556–63.

The development of artificial hearts in patients with end-stage heart disease has been limited by the major issues of thromboembolism or hemorrhage. Valvular bioprostheses are associated with a low incidence of these complications. The authors used bioprosthetic materials in the construction of a novel artificial heart (C-TAH) and report here the device characteristics and its first clinical applications in two patients aged 76 and 68, respectively, with end-stage dilated cardiomyopathy at imminent risk of death from biventricular heart failure and not eligible for transplant. This preliminary experience could represent an important contribution to the development of total artificial hearts using bioprosthetic materials. *(Summary: J. Mantz. Image: J.P. Rathmell, based on device illustration in the original article.)*

A multicenter trial of remote ischemic preconditioning for heart surgery. N Engl J Med 2015; 373:1397–407. Remote ischemic preconditioning in cardiac surgery—ineffective and risky? N Engl J Med 2015; 373:1470–2.

Remote ischemic preconditioning (RIPC) reduces biomarkers of ischemic and reperfusion injury in patients undergoing cardiac surgery, but uncertainty about clinical outcomes remains. In this prospective, double-blind, multicenter, randomized, controlled trial including 1,403 patients undergoing cardiac surgery on cardiopulmonary bypass under propofol anesthesia, upper limb remote preconditioning was compared with sham intervention. The primary outcome was a composite of death, myocardial infarction, stroke, or acute renal failure up to the time of hospital discharge. There was no significant between-group difference in the rate of the composite primary end point (99 patients [14.3%] in the RIPC group and 101 [14.6%] in the sham-arm, $P = 0.89$) or of any of the individual components. RIPC showed no benefit in this study and its safety as a cardioprotective strategy should be carefully investigated in additional, adequately powered studies, specifically in patients undergoing nonsurgical interventions. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

A randomized, controlled trial of total knee replacement. N Engl J Med 2015; 373:1597–606.

This randomized controlled trial enrolled 100 patients with moderate-to-severe knee osteoarthritis who were eligible for unilateral total knee replacement. Patients were randomly assigned to undergo total knee replacement followed by 12 weeks of nonsurgical treatment or to receive only the 12 weeks of nonsurgical treatment delivered by physiotherapists and dietitians and consisting of exercise, education, dietary advice, use of insoles, and pain medication. The primary outcome was the change from baseline to 12 months in the mean score on four Knee Injury and Osteoarthritis Outcome Score subscales, covering pain, symptoms, activities of daily living, and quality of life. The total-knee-replacement group had greater improvement in the four Knee Injury and Osteoarthritis Outcome Score subscale scores than did the nonsurgical-treatment group (32.5 *vs.* 16.0; adjusted mean difference, 15.8 [95% confidence interval, 10.0 to 21.5]), but also a higher number of serious adverse events than the nonsurgical-treatment group (24 *vs.* 6, $P = 0.005$). *(Summary: J. Mantz. Image: J.P. Rathmell.)*

Music as an aid for postoperative recovery in adults: A systematic review and meta-analysis. Lancet 2015; 386:1659–71.

Music is a noninvasive, safe, and inexpensive intervention that can be delivered easily and successfully. This systematic review and meta-analysis aimed to assess whether music improves recovery after surgical procedures. Seventy-three randomized controlled trials were included. It was shown that music reduced postoperative pain (standardized mean difference −0.77 [95% CI, −0.99 to −0.56]), anxiety (−0.68 [−0.95 to −0.41]), and analgesia use (−0.37 [−0.54 to −0.20]), and increased patient satisfaction (1.09 [0.51 to 1.68]), but length of stay did not differ (standardized mean difference −0.11 [−0.35 to 0.12]) between intervention group and controls. Music could be offered as a way to help patients reduce pain and anxiety during the postoperative period. *(Summary: J. Mantz. Image: ©Thinkstock.)*

Effect of a buffered crystalloid solution *vs* saline on acute kidney injury among patients in the intensive care unit: The SPLIT randomized clinical trial. JAMA 2015; 314: 1701–10. Assessing toxicity of intravenous crystalloids in critically ill patients. JAMA 2015; 314:1695–7.

Recent evidence supports the use of crystalloids as the first choice of fluids to be given to intensive care unit patients, but the best crystalloid (saline or buffered crystalloid) remains to be determined. This blinded prospective randomized multicenter trial enrolling 2,278 intensive care unit patients requiring fluid loading compared administration of saline *versus* buffered crystalloids (Plasma-Lyte 148). The primary outcome was the proportion of patients with acute kidney injury. The use of a buffered crystalloid compared with saline reduced neither the risk of acute kidney injury nor the need for renal replacement therapy. These results provide reassurance that neither 0.9% saline nor a low-chloride electrolyte solution appears to be particularly hazardous when the total dose used in patients at low-to-moderate risk is about 2 l. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

Effect of noninvasive ventilation *vs* oxygen therapy on mortality among immunocompromised patients with acute respiratory failure: A randomized clinical trial. JAMA 2015; 314:1711–9. The changing landscape of noninvasive ventilation in the intensive care unit. JAMA 2015; 314:1697–9.

Noninvasive ventilation has been recommended to decrease mortality among immunocompromised patients with hypoxemic acute respiratory failure. However, its effectiveness for this indication remains unclear. In this randomized controlled trial, Intensive care unit patients with hematologic malignancies or solid tumors were randomly assigned to early noninvasive ventilation (n = 191) or oxygen therapy alone (n = 183). The primary outcome was day-28 mortality. Among immunocompromised patients admitted to the intensive care unit with hypoxemic acute respiratory failure, early noninvasive ventilation compared with oxygen therapy alone did not reduce 28-day mortality. *(Summary: J. Mantz. Image: J.P. Rathmell.)*

Naproxen with cyclobenzaprine, oxycodone/acetaminophen, or placebo for treating acute low back pain: A randomized clinical trial. JAMA 2015; 314:1572–80.

Appropriate pharmacologic management of acute low back pain remains a controversial topic despite the frequency with which this problem is seen in emergency departments, primary care offices, and pain clinics. Often opioids or muscle relaxants are prescribed despite significant rates of side effects and, particularly in the case of opioids, abuse potential. In their recent study, Friedman *et al.* randomized 323 patients suffering from acute low back pain to a 10-day course of (1) naproxen + placebo; (2) naproxen + cyclobenzaprine; or (3) naproxen + oxycodone/acetaminophen. They found no differences in disability related to back pain 1 week later (primary outcome), and no differences between groups with respect to pain or function at either 7 days or 3 months. Thus monotherapy with a simple nonsteroidal drug appears to be as effective as other commonly used combination therapies on several important outcomes for the treatment of acute low back pain. *(Summary: J.D. Clark. Image: J.P. Rathmell.)*

Evaluation of a cardiopulmonary resuscitation curriculum in a low resource environment. Int J Med Educ 2015; 6:136–41.

The scientific basis and clinical application of cardiopulmonary resuscitation (CPR) is a worldwide initiative. The International Liaison Committee on Resuscitation (ILCOR) is the major sponsor of modern day CPR protocols. Chang *et al.* evaluated whether a "... Universal [ILCOR] algorithm-based [CPR] curriculum taught in a tertiary care hospital in Liberia increases local health care provider knowledge and skill comfort level." Knowledge and skill were assessed before and after students attended lectures and participated in CPR simulation educational activities. Knowledge, clinical skill, and student comfort level providing CPR were enhanced by this educational initiative. Examples of the success of the CPR simulation education included "... 93.2% of participants perform[ing] the pulse check within 10 seconds, and 97.7% perform[ing] defibrillation within 180 seconds." *(Summary: A.J. Schwartz. Image: J.P. Rathmell.)*