

Articles of Interest

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BLOOD CONSERVATION

Safety, efficacy, and cost of intraoperative cell salvage and autotransfusion after off-pump coronary artery bypass surgery: A randomized trial.

Murphy GJ, Rogers CS, Lansdowne WB, et al. *J Thorac Cardiovasc Surg.* 2005;130:20-8.

This randomized, controlled study (n = 60 patients) demonstrates the effectiveness of intraoperative autotransfusion during off-pump myocardial revascularization. Patients in the autotransfusion group had significantly higher hemoglobin concentrations in the postoperative period and a 20% reduction in transfusion of homologous blood products.

CEREBRAL PROTECTION

Optimal temperature for selective cerebral perfusion.

Strauch JT, Spielvogel D, Lauten A, et al. *J Thorac Cardiovasc Surg.* 2005;130:74-82.

Cerebral perfusion temperatures during antegrade cerebral perfusion and their affect on cerebral metabolism and neurological outcomes are evaluated in this study. Young piglets were subjected to a period of hypothermic circulatory arrest at 20°C using alpha-stat pH management. Four study groups were then assigned to differing temperatures of selective cerebral perfusion. Lower perfusion temperatures (10-15°C) provide superior recovery of cerebral metabolism, and optimal neurologic recovery is dependent on stable hemodynamics in the postoperative period.

A novel protocol of retrograde cerebral perfusion with intermittent pressure augmentation for brain protection.

Kitahori K, Takamoto S, Yakayama H, et al. *J Thorac Cardiovasc Surg.* 2005;130:363-70.

EXTRACORPOREAL MEMBRANE OXYGENATION

Preoperative ECMO in transposition of the great arteries with persistent pulmonary hypertension.

Jaillard S, Belli E, Rakza T, et al. *Ann Thorac Surg.* 2005; 79:2155-8.

HEMATOLOGY

Preemptive use of bivalirudin for urgent on-pump coronary artery bypass grafting in patients with potential heparin-induced thrombocytopenia.

Dyke CM, Koster A, Veale JJ, Maier GW, et al. *Ann Thorac Surg.* 2005;80:299-303.

Anticoagulation management and cardiac surgery in patients with heparin-induced thrombocytopenia.

Riess FC. *Semin Thorac Cardiovasc Surg.* 2005 Spring;17: 85-96.

Recombinant human antithrombin III restores heparin responsiveness and decreases activation of coagulation in heparin-resistant patients during cardiopulmonary bypass.

Avidan MS, Levy JH, van Aken H, et al. *J Thorac Cardiovasc Surg.* 2005;130:107-13.

Patients unresponsive to standard heparin loading doses for cardiopulmonary bypass (CPB) pose significant risk for thromboembolic complications. A single bolus (75 u/kg) of antithrombin III is effective in restoring heparin responsive and elevating activated clotting times prior to CPB. Recombinant antithrombin III is safer and more effective than fresh frozen plasma administration.

Glycoprotein IIb/IIIa inhibition reduces prothrombotic events under conditions of deep hypothermic circulatory arrest.

Straub A, Azevedo R, Beierlein W. *Thromb Haemost.* 2005;94:115-22.

MYOCARDIAL PROTECTION

Effect of cardioplegic and organ preservation solutions and their components on coronary endothelium-derived relaxing factors.

Yang Q, He GW. *Ann Thorac Surg.* 2005; 80:757-67.

This specific and comprehensive review describes various preservation solutions and their effect on endothelial damage and subsequent ischemia-reperfusion injury. The constituents of common solutions are mentioned along with future considerations such as nitric oxide substrates, free radical scavengers,

sodium-hydrogen ion exchange inhibitors, and hyperpolarizing agents.

Cardioprotective effects of acute normovolemic hemodilution in patients undergoing coronary artery bypass surgery.

Licker M, Ellenberger C, Sierra J, et al. *Chest*. 2005;128:838–47.

Pretreatment with an adenosine A₁ receptor agonist and lidocaine: A possible alternative to myocardial ischemic preconditioning.

Canyon SJ, Dobson GF. *J Thorac Cardiovasc Surg*. 2005;130:371–377.

OUTCOMES

Is hospital procedure volume a reliable marker of quality for coronary artery bypass surgery? A comparison of risk and propensity adjusted operative and midterm outcomes.

Zacharias A, Schwann TA, Riordan CJ, et al. *Ann Thorac Surg*. 2005;79:1961–69.

Conventional wisdom suggests that lower mortality and improved outcomes are associated with large procedure volumes. These authors, serving at both low-volume and high-volume hospitals, studied whether outcomes were determined by surgical expertise or institution and if caseloads had later implications (3 years) for patients. The authors demonstrate in their investigation that surgeon volume, not institution volume, is the primary determinant of patient outcomes. Significant differences in patient outcomes may be reflected by low-volume programs served by low-volume surgeons. Important future ramifications affecting patient referrals and reimbursement from Medicare and commercial insurers may stem from investigations such as this and from other larger databases such as The Society of Thoracic Surgeons, New York State and other organizations (Leapfrog).

Gender-specific practice guidelines for coronary artery bypass surgery: Perioperative management.

Edwards FH, Ferraris VA, Shahian DM, et al. *Ann Thorac Surg*. 2005;79:2189–94.

Implementing tight glucose control after coronary artery bypass surgery.

Carr JM, Sellke FW, Fey M, et al. *Ann Thorac Surg*. 2005;80:902–9.

Glucose control in diabetic patients during surgery has proven clinical benefits. Most cardiac surgical have implemented protocols to protect this patient population. These authors have extended this protocol to all cardiac surgical patients (818 patients) and reduced the incidence of mediastinitis from 1.6–0%.

Continued efforts are directed to improving clinical protocols, compliance, clinical measures and defining variables that may affect glucose control.

PATHOPHYSIOLOGY

Sivelestat reduces inflammatory mediators and preserves neutrophil deformability during simulated extracorporeal circulation.

Matsuzaki K, Hiramatsu Y, Homma S, et al. *Ann Thorac Surg*. 2005;80:611–7.

Differential cardiac gene expression during cardiopulmonary bypass: Ischemia-independent upregulation of proinflammatory genes.

Podgoreanu MV, Michelotti GA, Sato Y, et al. *J Thorac Cardiovasc Surg*. 2005;130:330–39.

Phosphodiesterase type 4 inhibitor rolipram inhibits activation of monocytes during extracorporeal circulation.

Sato Y, Hiramatsu Y, Homma S, et al. *J Thorac Cardiovasc Surg*. 2005;130:346–50.

PEDIATRIC PERFUSION

Using a miniaturized circuit and an asanguineous prime to reduce neutrophil-mediated organ dysfunction following infant cardiopulmonary bypass.

Karamlou T, Schultz JM, Silliman C, et al. *Ann Thorac Surg*. 2005;80:15–21.

High flow rates during modified ultrafiltration decrease cerebral blood flow velocity and venous oxygen saturation in infants.

Rodriguez RA, Ruel M, Broecker L, Cornell G. *Ann Thorac Surg*. 2005;80:22–8.

Randomized comparison between normothermic and hypothermic cardiopulmonary bypass in pediatric open-heart surgery.

Caputo M, Bays S, Roders CA, et al. *Ann Thorac Surg*. 2005;80:982–8.

Cold-induced fluid extravasation during cardiopulmonary bypass in piglets can be counteracted by use of iso-oncotic prime.

Farstad M, Kvalheim VL, Husby P. *J Thorac Cardiovasc Surg*. 2005;130:287–94.

Tissue oxygenation index is a useful monitor of histologic and neurologic outcome after cardiopulmonary bypass in piglets.

Hagino I, Anttila V, Zurakowski D, et al. *J Thorac Cardiovasc Surg*. 2005;130:384–92.

PERFUSION TECHNIQUE

Total leukocyte control for elective coronary bypass surgery does not improve short-term outcome.

Salamonsen RF, Anderson J, Anderson M, et al. *Ann Thorac Surg.* 2005;79:2032–9.

Leukocyte reduction has been reported to reduce inflammatory mediators and their associated organ damage. This study suggests that total leukocyte reduction, while safe, does not significantly reduce post-operative organ dysfunction or recovery after elective coronary artery bypass surgery. Future investigations should determine if selective timing of leukocyte reduction will be more beneficial in improving major organ function and outcomes.

The relationship between oxygenator exhaust P(CO₂) and arterial P(CO₂) during hypothermic cardiopulmonary bypass.

Graham JM, Gibbs NM, Weightman WM, et al. *Anaesth Intensive Care.* 2005;33:457–61.

The Smart Canula(TM): A new tool for remote access perfusion in limited access cardiac surgery.

von Segesser LK, Jegger D, Mucciolo G, et al. *Heart Surg Forum.* 2005;8:E241–5.

How to handle remote access perfusion for endoscopic cardiac surgery.

Schachner T, Bonaros N, Feuchtner G, et al. *Heart Surg Forum.* 2005;8:E232–5.

Recannulation of the right axillary artery for complex aortic surgeries.

Shetty R, Voisine P, Mathieu P, et al. *Tex Heart Inst J.* 2005;32:194–7; discussion 185.

Right axillary artery cannulation for surgical management of the hostile ascending aorta.

Kokotsakit J, Lazopoulos G, Milonakis M, et al. *Tex Heart Inst J.* 2005;32:189–93; discussion 185.

VENTRICULAR ASSIST

Initial experience with the Abiomed AB5000 ventricular assist device system.

Samuels LE, Holmes EC, Garwood P, Ferdinand F. *Ann Thorac Surg.* 2005;80:309–12.

Unlike previous models, the AB5000 is a pneumatically driven pulsatile pump driven by an automatic, *vacuum-assisted* console. The AB5000 was designed to serve as a bridge-to-transplant or recovery. Four patients and the authors' clinical experiences are described. The authors caution against the use of high-vacuum in combination with small inflow cannulas based on early problems with hemolysis.

Reloading the heart: A new animal model of left ventricular assist device removal.

Mizuno T, Weisel RD, Li R. *J Thorac Cardiovasc Surg.* 2005;130:99–106.

Mechanical support of total cavopulmonary connection with an axial flow pump.

Riemer RK, Amir G, Reichenbach SH, Reinhartz O. *J Thorac Cardiovasc Surg.* 2005;130:351–354.