

Update of Perfusion Taskforce: Renal Protection Guidelines

Kenneth G. Shann, CCP

Massachusetts General Hospital, Boston, MA.

Acute kidney injury (AKI) and renal complications in general complicates recovery in up to 30% of patients following cardiac surgery.¹ AKI requiring renal replacement therapy occurs in 2 – 5% of patients following cardiac surgery and is associated with a mortality rate of 50%. There is wide regional and national variation in rates of renal complications after cardiac surgery with limited synthesized evidence for strategies to optimize the prevention of AKI.

Pharmacologic and CPB strategies have demonstrated wide variability in their effectiveness to prevent renal complications after cardiac surgery. The field is in need of a high quality multidisciplinary synthesis and recommendations on what pharmacological and CPB strategies reduce the risk of renal complications, and which ones may increase risk. There are numerous approaches for minimizing renal complications by use of CPB circuits, circuit size and coating, as well as other pump-related adaptations including pulsatile flow that require investigation and synthesis of the evidence.

Therefore, the Society of Thoracic Surgeons (STS), Society of Cardiovascular Anesthesiologists (SCA), and the American Society of Extracorporeal Technology (AmSECT) collaborated to develop evidenced-based clinical practice guidelines to identify strategies to minimize the incidence of AKI after cardiac surgery. The multidisciplinary taskforce synthesized the evidence for renal preventive strategies using the same methodology previously used to develop clinical practice guidelines.^{2,3} In short, systematic reviews and scoring of the literature were conducted and recommendations generated regarding strategies to reduce the risk of AKI after adult cardiac surgery. In addition, these systematic reviews highlighted gaps in the scientific literature and areas where further scientific investigation was needed.

Specifically, the taskforce synthesized and scored the evidence in 4 topic areas: 1) pharmacologic strategies, 2) fluid management and transfusion, 3) cardiopulmonary bypass management (CPB), and 4) targeted strategies (e.g., remote ischemic preconditioning and prophylactic dialysis). When there was a sufficient number of published randomized controlled trials focused on a preventive strategy the taskforce conducted systematic meta-analyses of the evidence and included in the guidelines.

This presentation will summarize the initial work of this multi-disciplinary and multi-societal taskforce.

References:

1. O'Neal JB, Shaw AD, Billings FT 4th. Acute kidney injury following cardiac surgery: current understanding and future directions. *Crit Care*. 2016 Jul 4;20(1):187.
2. Engelman R, Baker RA, Likosky DS, Grigore A, Dickinson TA, Shore-Lesserson L, Hammon JW. The Society of Thoracic Surgeons, The Society of Cardiovascular Anesthesiologists, and The American Society of ExtraCorporeal Technology: Clinical Practice Guidelines for Cardiopulmonary Bypass--Temperature Management During Cardiopulmonary Bypass. *J Cardiothorac Vasc Anesth*. 2015 Aug;29(4):1104-13.
3. Society of Thoracic Surgeons Blood Conservation Guideline Task Force, Ferraris VA, Brown JR, Despotis GJ, Hammon JW, Reece TB, Saha SP, Song HK, Clough ER; Society of Cardiovascular Anesthesiologists Special Task Force on Blood Transfusion, Shore-Lesserson LJ, Goodnough LT, Mazer CD, Shander A, Stafford-Smith M, Waters J; International Consortium for Evidence Based Perfusion, Baker RA, Dickinson TA, FitzGerald DJ, Likosky DS, Shann KG. 2011 update to the Society of Thoracic Surgeons and the Society of Cardiovascular Anesthesiologists blood conservation clinical practice guidelines. *Annals of Thoracic Surgery* 2011 Mar;91(3):944-82.