

So, how does TRANSFORM-HF impact the practice of nephrology? As cardiorenal syndrome is a major cause of acute kidney injury in hospitalized patients, both cardiologists and nephrologists target effective decongestion, which is associated with improved post-discharge outcomes. The current standard of care for patients hospitalized with acute, decompensated CHF includes conversion of oral to intravenous loop diuretics with a stepwise increase in dose, administered as either bolus or continuous infusion (5, 6). Diuretic resistance should be addressed by increasing the loop diuretic dose or adding a thiazide-type diuretic. Although TRANSFORM-HF did not show significant differences in mortality or rehospitalization for patients with CHF who were prescribed torsemide versus furosemide, further investigation into the potential differences among specific drugs within diuretic classes may yet uncover unexpected benefits and is worth examining. ■

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Prevention of Cardiac Surgery-Associated Acute Kidney Injury

Commentary on the 2023 STS/SCA/AmSECT Guidelines

By Pey-Jen Yu, Karl Bocchieri, and Hugh Cassiere

Acute kidney injury (AKI) occurs in 5%–42% of patients undergoing cardiac surgery, making it one of the most common peri-operative complications in this patient population (1). Even subtle declines in postoperative kidney function confer an increased risk of postoperative mortality and persistent kidney injury (2, 3).

The Society of Thoracic Surgeons (STS), Society of Cardiovascular Anesthesiologists (SCA), and American Society of Extracorporeal Technology (AmSECT) recently published their consensus Clinical Practice Guidelines for the Prevention of Adult Cardiac Surgery-Associated Acute Kidney Injury (4). This is a pragmatic guideline with seven recommendations (Table 1).

The new cardiac surgery-associated (CSA)-AKI guidelines reinforce standard cardiac surgical practices for most institutions. For example, avoidance of hyperthermic perfusion (>37°C) remains a class I recommendation to prevent cerebral hyperthermia. Elements of the Kidney Disease: Improving Global Outcomes (KDIGO) bundle, such as peri-operative discontinuation of angiotensin-converting enzyme inhibitors and angiotensin-receptor blockers, avoiding hyperglycemia, and close hemodynamic monitoring, are already part of existing guidelines to avoid hypotension and infection and to optimize systemic perfusion. The use of minimally invasive extracorporeal circulation is currently a class IIA recommendation to reduce blood loss and transfusion.

Select recommendations continue to evolve and expand on prior recommendations. Notably, the new CSA-AKI guidelines officially recommend against using dopamine and mannitol for adult cardiac surgery patients. Furthermore, although prior guidelines have recommended adjusting the pump flow rate during cardiopulmonary bypass (CPB) based on oxygenation and metabolic parameters, the new CSA-AKI guidelines specify the use of goal-directed perfusion targeting oxygen delivery (DO_2) ≥ 270 mL/min/m² as a class I recommendation.

The one element in the new CSA-AKI guidelines that may deviate from current practices is its recommendation that fenoldopam may be used to reduce the risk of CSA-AKI as long as hypotension can be avoided (class IIB). The literature supporting this recommendation is conflicting. A prospective randomized clinical trial looking at attenuating immediate postoperative AKI showed no benefit and significantly more hypotension (5). It is also acknowledged by the authors of the new guidelines that KDIGO does not sup-

port using fenoldopam to prevent or treat AKI. Therefore, we would hesitate to adopt the use of fenoldopam to reduce the risk of CSA-AKI without more substantive evidence to support its use in this patient population.

The new CSA-AKI guidelines affirm existing clinical practices for the care of adult cardiac surgery patients. They also highlight the need for continued research for novel ways to reduce the incidence of CSA-AKI, as it remains a significant source of morbidity and mortality in patients undergoing cardiac surgery. ■

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Table 1. Summary of recommendations from the 2023 STS/SCA/AmSECT Clinical Practice Guidelines for the Prevention of Adult Cardiac Surgery-Associated Acute Kidney Injury

Recommendation	Class of recommendation, level of evidence
Avoid hyperthermic perfusion (>37°C).	Class I, level B-R
Use goal-directed oxygen-delivery strategy on CPB (avoid nadir $\text{DO}_2 < 270$ mL/min/m ²).	Class I, level B-R
Adopt KDIGO practice guidelines for patients at high risk of AKI.	Class IIA, level B-R
Fenoldopam infusion during CPB and peri-operatively may be reasonable if hypotension is avoided.	Class IIB, level B-R
Consider use of minimally invasive extracorporeal circulation.	Class IIB, level B-R
Use of dopamine infusion is not recommended.	Class III, level A
Use of mannitol to prime CPB is not recommended.	Class III, level B-R