

Nephropathy Post-TAVR

Nephropathy after TAVR is associated with increased mortality in MISHC data and in peer-reviewed literature.

Predictors of nephropathy post-TAVR in MISHC data include higher STS risk, diabetes, lower body weight, coronary artery disease, higher baseline serum creatinine, and anemia. Procedural characteristics strongly associated with acute kidney injury (AKI) include use of general anesthesia and use of contrast volume greater than 3 times the eGFR.

In addition to avoiding higher doses of iodinated contrast media during the procedure, adequate hydration has been demonstrated to decrease the incidence of nephropathy post procedure.

One protocol that has been utilized to manage hydration is the POSIDEON study protocol that is based on end-diastolic pressure measured during the catheterization procedure.

Definitions of AKI

VARC2

Creatinine increase to at least any stage 1 of the AKIN classification system in accordance with VARC-2 definitions. Increase in serum creatinine to 150–199% (1.5–1.99 × increase compared with baseline).

BMC2

Serum Creatinine increase > 0.5mg/dL over baseline.

Hydration protocol for TAVR

Pre-TAVR

Normal saline infusion: 3mL/kg x 1 hour

LVEDP-based post-TAVR hydration LVEDP at conclusion of TAVR	Rate of Normal saline infusion X 4 hours post TAVR
< 13	5mL/kg/hr
13-18	3 mL/kg/hr
18-25	1.5 mL/kg/hr
> 25	No additional hydration/implant team to decide

Contrast limits for TAVR procedure

- eGFR calculated for all TAVR patients before the procedure
- Goal for every TAVR is to limit the dose of contrast
- 2X and 3X the eGFR “contrast limits” are communicated to the implant team in the pre-TAVR time-out
 - When relevant, methods to limit the volume of contrast utilized are discussed prior to the TAVR procedure
 - Efforts are made to limit the volume of contrast delivered to patients during the TAVR procedure, with > 3X eGFR the maximum

ACKNOWLEDGEMENTS

The Michigan TAVR Best Practice Protocol Task Force: Mark Zainea, Mansoor Qureshi, Kirit Patel, Theodore Schreiber, Thomas Davis, Usman Khokhar, Omar Ali, P. Michael Grossman, Stanley Chetcuti, Raed Alnajar, Shelly Lall, Karen Kim, Zewditu Asfaw, and Himanshu Patel.

DISCLAIMER

Michigan TAVR Best Practice Protocols are based on consortium-wide consensus at the time of publication. Protocols will be updated regularly, and should not be considered formal guidance, and do not replace the professional opinion of the treating physician.

REFERENCES

Gurm H.S., Dixon S.R., Smith D.E., et al. "Renal function-based contrast dosing to define safe limits of radiographic contrast media in patients undergoing percutaneous coronary interventions". *J Am Coll Cardiol* 2011;58:907-914.

Gurm H.S., Seth M., Kooiman J., Share D. "A novel tool for reliable and accurate prediction of renal complications in patients undergoing percutaneous coronary intervention". *J Am Coll Cardiol* 2013;61:2242-2248.

Grossman, PM, Ali, SS, Aronow, HD, Boros, M, Nypaver, TJ, Schreiber, TL, Park, YJ, Henke, PK, Gurm, HS. Contrast-induced nephropathy in patients undergoing endovascular peripheral vascular intervention: Incidence, risk factors, and outcomes as observed in the Blue Cross Blue Shield of Michigan Cardiovascular Consortium. *J Interv Cardiol.* 2017 Jun;30(3):274-280. doi: 10.1111/joic.12379.

Barbash IM, Ben-Dor I, Dvir D, Maluenda G, Xue Z, Torguson R, Satler LF, Pichard AD, Waksman R. Incidence and predictors of acute kidney injury after transcatheter aortic valve replacement. *Am Heart J.* 2012 Jun;163(6):1031-6. doi: 10.1016/j.ahj.2012.01.009.