Study finds that team-based coaching reduces risks of acute kidney injury after heart procedures

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Findings from a new study published in *The Clinical Journal of the American Society of Nephrology,* involving a collaborative effort between

researchers at Dartmouth's Geisel School of Medicine, Vanderbilt, and Veteran's Affairs (VA) medical centers, show that an implementation science approach using team-based coaching and automated surveillance reporting significantly reduces the risk of acquiring post-procedural acute kidney injury (AKI) when compared to other interventions.

Up to 14 percent of the more than two million people in the U.S. who undergo cardiac catheterization procedures each year experience acute kidney injury (AKI), making it one of the most prevalent adverse events. Acute kidney injury is associated with a higher risk of cardiovascular events, prolonged hospitalization, end-stage renal disease, all-cause mortality, and higher acute care costs.

A growing body of research conducted in recent years has shown that there are some basic steps that cardiovascular interventional teams can take to help prevent AKIs from occurring in their patients. These include ensuring that patients are well-hydrated going into procedures and that they receive an IV fluid bolus, allowing them to eat and drink up to two hours before procedures, and limiting the amount of contrast dye used in procedures.

"The problem is that only about 25 percent of medical centers or cardiovascular interventional teams at those sites are applying the evidence base or official guidelines from leading consortiums like KDIGO (Kidney Disease: Improving Global Outcomes)," says Jeremiah Brown, Ph.D., a professor of epidemiology at Geisel and lead author on the study.

Rather than running another individual randomized trial to test how well certain components of the prevention guidelines worked, the study team's goal was to increase the uptake of those guidelines using a hybrid implementation-effectiveness randomized design. "We used a team-oriented approach based on implementation science—an emerging area

of multidisciplinary research that focuses on moving scientific evidence into routine practice," explains Brown.

Using what's known as a "2 x 2 factorial cluster-randomized trial," the investigators measured the effectiveness and implementation of three different monthly interventions in preventing AKI at 20 VA medical centers across the country over an 18-month period. Half the centers received team-based coaching sessions in a virtual learning collaborative (Collaborative) and half received technical one-on-one assistance (Assistance) from a nephrologist expert in AKI prevention. The two main groups were further randomized to either receive a surveillance dashboard report (Surveillance) that provided automated feedback on key performance metrics or no report (No Surveillance).

A total of 4,517 patients participated in the study, with 510 experiencing acute kidney injury. The study team found that the Collaborative with Surveillance intervention significantly outperformed the other groups, reducing the odds of AKI by 46 percent—to date the best finding in the field. Comparatively, the Collaborative with No Surveillance group and the Assistance with Surveillance group saw a 28 percent and a 24 percent reduction in the odds of AKI, respectively.

The study is the first U.S national randomized trial that uses an implementation science approach to advance the field, providing a unique opportunity for the investigators, says Brown.

"This gives us the recipe for the combination of interventions that work best," he says. "We hope to take what we've learned and scale it so that it can be shared with other catheterization laboratory teams around the country and internationally to help them more effectively address the problem of AKIs."

More information: Team-Based Coaching Intervention to Improve