

US prediction models for kidney injury following angioplasty hold up in Japan

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Models developed by the American College of Cardiology NCDR CathPCI Registry to predict the likelihood of angioplasty patients developing acute kidney injury and acute kidney injury requiring dialysis have proven to be effective among patients in Japan. This finding suggests these models may have international application as a preventive tool, according to a study published today in the *Journal of the American College of Cardiology*.

Acute kidney injury is a condition characterized by an abrupt or rapid decline in [kidney function](#). It is the most common non-cardiac complication following angioplasty and is associated with an increased risk of other complications, as well as death. This condition often can be prevented, however, by administering fluids and using cholesterol-lowering medications before conducting the procedure. By knowing who is at highest risk for acute kidney injury, it is possible to take these steps and prevent this complication.

The prediction models from the NCDR CathPCI Registry were applied to records from 11,041 patients from the Japan Cardiovascular Database, a registry comprised of 16 centers, between September 2008 and May 2014. The acute kidney injury model used 11 variables for predicting this complication, including age, baseline presence of kidney impairment, a history of stroke or [heart failure](#), and prior angioplasty. The acute kidney model involving dialysis used five variables: baseline presence of kidney impairment, diabetes, heart failure, presence of acute coronary syndrome, and cardiogenic shock.

Researchers found 10.1 percent of the patients experienced acute kidney injury and 1.5 percent had a kidney injury that required dialysis. Patients who experienced an acute kidney injury tended to be older, have more heart failure and [kidney dysfunction](#) prior to angioplasty, and a greater number of other medical conditions.

The study found that overall, the prediction model for acute kidney injury performed well. In the highest-risk group, the predicted incidence of acute kidney injury was 34 percent, compared to a 36 percent actual occurrence of the problem. Similar performance was observed among patients with and without [acute coronary syndrome](#).

For patients with acute kidney injury requiring dialysis, the predicted risk was 4 percent, compared to a 9 percent observed incidence. This discrepancy showed that the model underestimated the risk of dialysis among the highest-risk patients. Once the model was adjusted properly, it was better able to stratify risk.

Taku Inohara, M.D., the study's lead author and a cardiologist at Keio University School of Medicine in Tokyo, said that "these findings support the use of the NCDR models in Japan" and pointed out that knowing a patient's risk for acute kidney injury enables the provider to tailor treatment accordingly. "Given the validity of the NCDR acute [kidney injury](#) models in Japan, future research on how to best leverage these insights about patient risk to minimize the onset of [acute kidney injury](#) is warranted," he said.

"This is an example of how registries, like NCDR, can provide important information that once it is validated—as it is in this paper—can change practice," said Valentin Fuster, M.D., Ph.D., *Journal of the American College of Cardiology* editor-in-chief.

In an accompanying editorial, Peter A. McCullough, M.D., M.P.H.,

FACC, vice chief of medicine at Baylor University Medical Center in Dallas, said that the study is "an excellent example of how the NCDR Registry can be used to generate meaningful tools for prediction of complications that are set up for external validation from populations outside of the United States." He adds that because there are increasing numbers of patients with advanced kidney disease undergoing angioplasty, "there is an urgent need for safer approaches for these high-risk [patients](#)."

More information: *Journal of the American College of Cardiology*, [dx.doi.org/10.1016/j.jacc.2016.01.049](https://doi.org/10.1016/j.jacc.2016.01.049)

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