

Genetic variant may help predict risk of kidney damage after heart surgery

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Testing for a common genetic variant may help reveal which patients face an increased risk of developing kidney damage following heart surgery. The findings, which come from a study appearing in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN), may help investigators develop therapeutic strategies to mitigate this damage.

Acute kidney injury (AKI), an abrupt decline in [kidney function](#), is an increasingly prevalent and potentially serious condition following major surgery. Sometimes AKI arises after [heart surgery](#) because the kidneys are deprived of normal blood flow during the procedure. Deficiency in heme oxygenase-1 (HO-1), a key enzyme that helps maintain proper iron balance in the body, has been implicated in AKI in numerous animal models, but data on HO-1 in human AKI are limited.

To investigate, David E. Leaf, MD, MMSc (Brigham and Women's Hospital, Harvard Medical School) and his colleagues studied 2377 Caucasian patients undergoing heart surgery and looked for genetic variants in the HO-1 gene that are known to affect the gene's expression.

"We found that a common genetic variant in the HO-1 gene, which is present in approximately 40% of Caucasian individuals, is highly associated with development of AKI following cardiac surgery," said Dr. Leaf. The genetic variant is known to result in decreased expression of the HO-1 gene, leading to less production of the HO-1 enzyme. Patients with 2 copies of the gene variant were 58% more likely to develop AKI

after heart surgery compared with patients without the gene variant.

"These results are consistent with iron toxicity as a pathogenic feature of cardiac surgery-associated AKI, and HO-1 as a potential therapeutic target," said Dr. Leaf.

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