

A better way to predict heart attacks and strokes in space

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Credit: NASA

Researchers may have developed a more reliable way to predict the risk of heart attack and stroke in astronauts – and the technique may eventually help gauge the same danger for regular folks on Earth, too.

NASA astronauts currently undergo a special screening method that scans coronary arteries for a buildup of calcified plaque. This calcium scan, which is not routinely done in clinical practice, is a powerful tool in assessing cardiovascular risk. Yet scientists have had trouble

integrating the results from these scans with traditional risk factors for [heart](#) disease, such as high cholesterol, high blood pressure, diabetes and family history of heart attack.

But researchers have developed a new equation that combines the calcium scan scores with those well-established risk factors. The result is a more accurate way to predict a person's risk for having a stroke or developing heart disease within the next 10 years, according to findings published Monday in the American Heart Association journal *Circulation*.

"The application for NASA is incredibly important. You can imagine if someone had a heart attack in space, it would be catastrophic for the person and the mission," said Dr. Amit Khera, a cardiologist and the lead author of the study.

"But we were kind of serving two masters in this project. Obviously for NASA, it's a tool they need to help in decision-making for astronauts in their missions," said Khera, a professor of medicine at UT Southwestern Medical Center in Dallas. "But for terrestrial medicine as well, it has lots of potential applications in terms of helping us predict better who's at risk for [heart attack](#) and stroke, and who might need more intensive treatments."

The new risk scoring system is the first to help predict both heart disease and stroke, said Dr. Michael Blaha, a cardiologist not involved in the new study. It also looked at a younger age group than a similar [heart disease](#) risk calculator developed several years ago that also incorporated calcium scan results. That calculator, which Blaha helped develop, was based on patients at an average age of 65. In the new study, the average age was 51.

"It's been clear within the last several years that the calcium score by far

adds the most risk-predictive value on top of traditional risk factors, and this study helps confirm that," said Blaha, director of clinical research for the Johns Hopkins Ciccarone Center for the Prevention of Heart Disease in Baltimore.

"I like this new risk score. The only thing I'm not certain of is where it will fit in and what the clinical impact will be," he said. "I don't know how unique will it be in the space of risk prediction tools, which is already crowded."

For astronauts and other professions that come with a high level of danger, better cardiovascular risk calculators can be crucial. But having such tools available for the general population could help improve medical efficiency, Khera said.

Doctors already rely on certain [risk factors](#) to help gauge the need for prescriptions such as cholesterol-reducing statins or whether they should suggest a daily aspirin regimen for patients, he said. A new risk calculator could help medical professionals refine those assessments.

"Hopefully, we can eventually apply this tool in office-based practices to ... communicate better [with patients] about their risk and do that with more accuracy, so we can determine what might be the best treatment for them," Khera said.

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