

Study reveals safety of CT scans for rapid rule out of heart attacks in ER chest pain patients

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A highly detailed CT scan of the heart can safely and quickly rule out the possibility of a heart attack among many patients who come to hospital emergency rooms with chest pain, according to the results of a study that will be presented by researchers from the Perelman School of Medicine at the University of Pennsylvania today at the American College of Cardiology's 61st Annual Scientific Session and published concurrently in the *New England Journal of Medicine*. The multicenter randomized trial comparing coronary CT angiography (CCTA) and traditional cardiac testing methods revealed that chest pain patients with negative CT scans can be discharged safely from the hospital within hours. The findings may offer a new strategy for relieving the emergency room crowding that plagues many of America's hospitals, and could help to trim millions of dollars off the costs of care for one of the leading causes of ER visits.

Chest pain is the second most common reason people go the emergency room in the United States, accounting for as many as 8 million visits each year at a cost of several billion dollars. Just 5 to 15 percent of those patients are ultimately found to be suffering from heart attacks or other serious [cardiac diseases](#), since issues from pneumonia to indigestion to anxiety can cause the same types of symptoms. But more than half of chest pain patients are admitted to the hospital for observation or traditional evaluation such as cardiac catheterization or a [stress test](#).

"Until now, our methods for diagnosing patients with [acute coronary syndromes](#) in the emergency room setting have been both time-consuming and costly. We have spent the past 30 years trying to find a simple test that will tell patients, right now, 'It's not your heart.' This trial is the first time we've been able to accomplish that," said senior author Judd Hollander, MD, clinical research director in the department of [Emergency Medicine](#) and the senior author of the study.

The authors studied 1,370 patients at five medical centers who were classified as low-to-intermediate risk for [heart attack](#), meaning they had no previously identified heart disease and did not have cardiac risk factors such as diabetes or high blood pressure. They randomized patients to one of two arms: those who received a CCTA scan and those who received conventional care strategies to rule out serious blockages of the arteries supplying the heart. Of 640 patients whose CCTA was negative, revealing no clinically important coronary artery blockages, none died or suffered a heart attack within 30 days. The investigators also found that patients in the CCTA arm were more than twice as likely to be discharged directly from the emergency department to their homes (50 percent) than those who underwent traditional care (23 percent). Patients in the CCTA arm also spent significantly less time in the hospital (a median of 18 hours), compared to those in the traditional care group (25 hours). Those with negative tests had an even greater difference in the length of their hospital stay (12 vs. 25 hours). Additionally, CCTA proved to be more effective at identifying patients with coronary artery disease compared to stress testing (9 percent of patients had a positive test versus 3.5 percent).

"CT scanning has long been used in emergency departments to learn the cause of other symptoms like abdominal pain and shortness of breath. It's available in many hospitals around the clock, so now we can answer important questions about chest pain right away and send patients home much more quickly," said lead author Harold Litt, MD, PhD, chief of

Cardiovascular Imaging in the department of Radiology. "This test allows us to get a very good look at the coronary arteries in a noninvasive way, and for the large majority of people who are shown to not have a narrowing of the arteries, it's an excellent alternative to [cardiac catheterization](#)."

CCTA generates three-dimensional images of the heart and the blood vessels surrounding it. The tests, which are conducted like a standard CT scan, cost about \$1,500 and allow patients who have a negative scan to be discharged from the hospital within hours, while costs for those admitted to the hospital for stress testing and monitoring typically total more than \$4,000 for each patient.

Provided by University of Pennsylvania School of Medicine

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