CORONARY COMPUTED TOMOGRAPHIC ANGIOGRAPHY:

THE EVALUATION OF ACUTE CHEST PAIN

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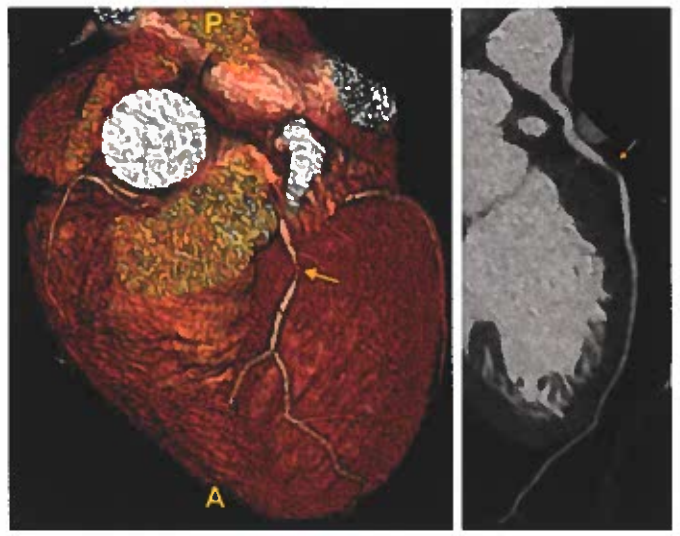
Coronary Computed Tomographic Angiography (CCTA) has been recommended as a frontline testing strategy in the evaluation of patients who have stable and acute chest pain and no known coronary artery disease (CAD).

We interviewed Dr. Markus Scherer, the Director of Cardiac CT and Structural Heart Imaging at Atrium Health Sanger Heart & Vascular Institute on this technology offering.

What is a CCTA exam? What does this type of imaging allow you to see?
Coronary computed tomographic angiography (CCTA) allows you to see the coronary arteries and atherosclerotic plaques that can cause blockages associated with angina or heart attacks. Iodinated contrast is injected into a peripheral IV and advanced imaging is performed for the study.

How does this diagnostic imaging exam benefit both patients and physicians?
CCTA provides detailed information regarding the presence and extent of coronary artery disease. CCTA is the most accurate noninvasive imaging modality capturing this pathology, allowing physicians and patients to understand the prognosis and make informed decisions for patient care.

How does the CCTA testing strategy help physicians stay in compliance with the recently updated American College of Cardiology and American Heart Association guidelines for the evaluation and diagnosis of chest pain?
By having access to cardiac-capable CT imaging, providers may refer appropriately selected patients for CCTA in compliance with the guidelines. CCTA is now a class I indication for the evaluation of patients with unestablished coronary artery disease and stable chest pain with an intermediate likelihood of obstructive CAD as a cause of their symptoms. Stress testing also has a class I recommendation but has less supportive evidence to favor its use over CCTA in this population. The decision to proceed with a CCTA vs a stress testing route may be contingent on access to facilities with different capabilities as well as patient characteristics.



Example showing a blockage in a patient's left anterior descending (LAD) coronary artery as identified with the arrows in two different reconstruction formats.

When is this imaging needed and what kind of patient is the best candidate for CCTA?
CCTA may be needed to determine if a patient's symptoms are related to CAD. The best candidates for CCTA are patients with no established history of CAD, no contraindications to the use of iodinated contrast, and who can tolerate premedications (sublingual nitroglycerin and possible beta-blocker) and brief breath holding.

What is the most important clinical information for physicians to learn from CCTA?
Physicians will learn if their patient has coronary atherosclerotic plaques and the extent of narrowing in their vessels that warrant either medical management or cardiology referral in consideration of invasive coronary angiography and revascularization procedures.

What benefits do you see for patients receiving this exam versus other cardiac testing strategies, like a stress test?
Stress tests are commonly performed to evaluate suspected angina, but they do not allow physicians to directly visualize the presence/extent of coronary atherosclerosis and stenoses, as can be done with CCTA. Stress tests can *infer* an increased likelihood of a patient having CAD, but do not confirm its presence. In order to confirm the presence or absence of CAD after an abnormal stress test, either invasive coronary angiography or CCTA is commonly pursued to proceed with treatment. Studies have shown that in patients with unknown CAD, those who receive stress tests compared with CCTA are more likely to have unnecessary cardiac catheterization.

Final thoughts from Dr. Scherer:
The goal of testing is to provide the most direct and accurate answers for patients and clinicians to guide patient care safely and efficiently. In this regard, access to high-quality CCTA programs may improve patient care pathways for the evaluation of CAD.

What Can Patients Expect?

Before the Exam:
Patients can expect to receive a phone call from a nurse the day before their CCTA exam. They will go over exam specifics and the nurse will make sure the patient has any medications they are instructed to take prior to arriving for their study if required. The nurse will also answer any questions the patient may have.

Day of the Exam:
A nurse will start an IV that can withstand contrast being injected at a rapid injection rate, which is necessary for images to be diagnostic. The nurse will give any additional medications as needed to get the patient's heart rate below 60 bpm. The patient's blood pressure will be monitored.

During and after the Scan:
When the patient is laying on the CT table, the technologist will explain what will happen during the exam. Patients will be asked to hold their arms above their head and briefly hold their breath for scans and contrast injections. Partly through the sequence of imaging acquisitions, the patient will be given Nitroglycerin tablets under their tongue. These tablets dilate the arteries in the heart so they can be better visualized for a more accurate interpretation. The entire scanning process in the CT suite takes about 15-20 minutes. When the exam is done, the patient will have their blood pressure taken one last time.

Total time in the facility is typically 1-1.5 hours. ■