RadiologyInfo.org
For patients

Cardiac CT for Calcium Scoring



Cardiac computed tomography (CT) for Calcium Scoring uses special x-ray equipment to produce pictures of the coronary arteries to determine if they are blocked or narrowed by the buildup of plaque – an indicator for atherosclerosis or coronary artery disease (CAD). The information obtained can help evaluate whether you are at increased risk for heart attack.

Tell your doctor if there's a possibility you are pregnant and discuss any recent illnesses, medical conditions, medications you're taking, and allergies. You will be instructed not to eat or drink anything and to avoid caffeine and smoking for four hours prior to the exam. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown.

What is Cardiac CT for Calcium Scoring?

Computed tomography, more commonly known as a CT or CAT scan, is a diagnostic medical imaging test. Like traditional x-rays, it produces multiple images or pictures of the inside of the body.

A CT scan generates images that can be reformatted in multiple planes. It can even generate three-dimensional images. Your doctor can review these images on a computer monitor, print them on film or via a 3D printer, or transfer them to a CD or DVD.

CT images of internal organs, bones, soft tissue, and blood vessels provide greater detail than traditional x-rays. This is especially true for soft tissues and blood vessels.

A cardiac CT scan for coronary calcium is a noninvasive way of obtaining information about the presence, location and extent of calcified plaque (http://www.radiologyinfo.org) in the coronary arteries—the vessels that supply oxygen-containing blood to the heart muscle. Calcified plaque results when there is a build-up of fat and other substances under the inner layer of the artery. This material can calcify which signals the presence of atherosclerosis, a disease of the vessel wall, also called coronary artery disease (CAD) (http://www.radiologyinfo.org) . People with this disease have an increased risk for heart attacks. In addition, over time, progression of plaque build up (CAD) can narrow the arteries or even close off blood flow to the heart. The result may be chest pain, sometimes called "angina (http://www.radiologyinfo.org) ," or a heart attack.

Because calcium is a marker of CAD, the amount of calcium detected on a cardiac CT scan is a helpful prognostic (http://www.radiologyinfo.org) tool. The findings on cardiac CT are expressed as a calcium score (http://www.radiologyinfo.org) . Another name for this test is coronary artery calcium scoring.

What are some common uses of the procedure?

The goal of cardiac CT scan for calcium scoring is to determine if CAD is present and to what extent, even if there are no

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symptoms. It is a screening study that may be recommended by a physician for patients with risk factors for CAD but no clinical symptoms. Your doctor first estimates your risk of a heart attack or stroke over the next 10 years using a risk calculator that combines your age, blood pressure, cholesterol levels, and other health information. Calcium scoring is most useful when that estimate falls in a middle range and it is not clear whether you would benefit from cholesterol-lowering medicine. In that situation, your calcium score can help you and your doctor make a more confident decision. Current national guidelines suggest considering the test for men age 40 and older and women age 45 and older whose estimated risk is borderline or intermediate.

The major risk factors for CAD are:

- high blood cholesterol levels
- family history of heart attacks
- diabetes
- high blood pressure
- cigarette smoking
- overweight or obese
- physical inactivity

Your doctor may also consider other factors that raise risk, such as a family history of early heart disease, chronic inflammatory conditions, kidney disease, or certain pregnancy-related conditions.

Who interprets the results and how do I get them?

A radiologist (https://www.radiologyinfo.org/en/info/article-your-radiologist) , a doctor specially trained to supervise and interpret radiology exams, will analyze the images. The radiologist will send an official report to the doctor who ordered the exam.

A negative cardiac CT scan for calcium scoring shows no calcification (http://www.radiologyinfo.org) within the coronary arteries. This suggests that CAD is absent or so minimal it cannot be seen by this technique. The chance of having a heart attack over the next two to five years is very low under these circumstances.

A positive test means that CAD is present, regardless of whether or not the patient is experiencing any symptoms. The amount of calcification—expressed as the calcium score—may help to predict the likelihood of a myocardial infarction (http://www.radiologyinfo.org) (heart attack) in the coming years and helps your medical doctor or cardiologist decide whether the patient may need to take preventive medicine or undertake other measures such as diet and exercise to lower the risk for heart attack.

Under current national guidelines, finding any coronary calcium generally supports treating cholesterol to a lower target than would otherwise apply, and the target is lower still when more calcium is present. A score of zero may support delaying or holding off on cholesterol-lowering medicine in some people, while a high score may support starting it.

The extent of CAD is graded according to your calcium score:

You may need a follow-up exam. If so, your doctor will explain why. Sometimes a follow-up exam further evaluates a potential issue with more views or a special imaging technique. It may also see if there has been any change in an issue over time. Follow-up exams are often the best way to see if treatment is working or if a problem needs attention.

What are the benefits vs. risks?

Benefits

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- Cardiac CT for calcium scoring is a convenient and noninvasive way of evaluating whether you may be at increased risk for a heart attack.
- The exam takes little time, causes no pain, and does not require injection of contrast material (http://www.radiologyinfo.org) .
- The exam takes less than 20 minutes and you can return to normal activities immediately afterward.
- No radiation remains in a patient's body after a CT exam.
- The x-rays used for CT scanning should have no immediate side effects.

Risks

- There is always a slight chance of cancer from excessive exposure to radiation. However, the benefit of an accurate diagnosis far outweighs the risk involved with CT scanning.
- The radiation dose for this procedure varies. *See the Radiation Dose (https://www.radiologyinfo.org/en/info/safety-xray) page for more information.*
- Women should always tell their doctor and radiologic technologist if there is any chance they are pregnant. *See the Radiation Safety (https://www.radiologyinfo.org/en/info/safety-radiation) page for more information about pregnancy and x-rays.*
- Doctors do not generally recommend CT scanning for pregnant women unless medically necessary because of potential risk to the unborn baby.
- A high calcium score may sometimes be followed by other diagnostic tests for heart disease, which may or may not provide results with clinical value and can be associated with side effects.

What are the limitations of Cardiac CT for Calcium Scoring?

A person who is very large may not fit into the opening of a conventional CT scanner. Or, they may be over the weight limit, which varies by scanner, for the moving table.

CAD, especially in people below 50 years of age can be present without calcium (non-calcified plaque) and may not be detected by this exam.

Not all health insurance plans cover cardiac CT for calcium scoring.

A high heart rate may interfere with the image quality of the test.

A calcium score describes plaque that has hardened, or calcified. It does not measure softer plaque that has not yet calcified, and it does not show whether an artery is narrowed. Your calcium score is one part of your overall risk picture rather than a complete answer on its own.

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