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Cardiac CT for Calcium Scoring

What is Cardiac CT for Calcium Scoring?

CT scanning—sometimes called CAT scanning—is a noninvasive medical test that helps physicians diagnose and treat medical conditions. CT scanning combines special x-ray equipment with sophisticated computers to produce multiple images or pictures of the inside of the body. These cross-sectional images of the area being studied can then be examined on a computer monitor, printed or transferred to a CD.

A cardiac CT scan for coronary calcium is a non-invasive way of obtaining information about the presence, location and extent of calcified plaque 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). People with this disease have an increased risk for heart attacks. In addition, over time, progression of plaque buildup (CAD) can narrow the arteries or even close off blood flow to the heart. The result may be chest pain, sometimes called "angina," 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 tool. The findings on cardiac CT are expressed as a calcium score. 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 symptoms. It is a screening study that may be recommended by a physician for patients with risk factors for CAD but no clinical symptoms.

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

How should I prepare?

No special preparation is necessary in advance of a cardiac CT examination. You should continue to take your usual medications, but should avoid caffeine and smoking for four hours prior to the exam.

You should wear comfortable, loose-fitting clothing to your exam. You may be given a gown to wear during the procedure.

What does the equipment look like?

A CT scanner is a specialized x-ray machine that is spherical in shape with a mobile flat bed. The bed moves into the CT scan tunnel where the images are obtained. The CT machine has the ability to obtain images in multiple directions in a short period of time. Because of the speed of the recent CT scans in obtaining images, individuals generally do not have to stay inside the machine for prolonged periods. The computer workstation that processes the imaging

information is located in a separate room, where the technologist operates the scanner and monitors your examination.

How does the procedure work?

In many ways CT scanning works very much like other x-ray examinations; it uses radiation to produce images of the body. CT imaging is sometimes compared to looking into a loaf of bread by cutting the loaf into thin slices. When the image slices are reassembled by computer software, the result is a very detailed multidimensional view of the body's interior.

Refinements in detector technology allow new CT scanners to obtain multiple slices in a single rotation. These scanners, called "multislice CT" or "multidetector CT," allow thinner slices to be obtained in a shorter period of time, resulting in more detail and additional view capabilities. Modern CT scanners are so fast that they can scan through large sections of the body in just a few seconds.

How is the procedure performed?

The technologist begins by positioning you on the CT examination table, usually lying flat on your back or possibly on your side or on your stomach. Straps and pillows may be used to help you maintain the correct position and to hold still during the exam.

Electrodes (small, sticky discs) will be attached to your chest and to an electrocardiograph (ECG) machine that records the electrical activity of the heart. This makes it possible to record CT scans when the heart is not actively contracting.

Next, the table will move quickly through the scanner to determine the correct starting position for the scans. Then, the table will move slowly through the machine as the actual CT scanning is performed.

Patients are asked to hold their breath for a period of 10 to 20 seconds while images are recorded.

When the examination is completed, you will be asked to wait until the technologist verifies that the images are of high enough quality for accurate interpretation.

The entire procedure including the actual CT scanning is usually completed within 10 minutes.

What will I experience during and after the procedure?

Most CT exams are painless, fast and easy.

When you enter the CT scanner, special lights may be used to ensure that you are properly positioned. With modern CT scanners, you will hear only slight buzzing, clicking and whirring sounds as the CT scanner revolves around you during the imaging process.

You will be alone in the exam room during the CT scan. However, the technologist will be able to see, hear and speak with you at all times.

After a CT exam, you can return to your normal activities.

Who interprets the results and how do I get them?

A physician will analyze the images and send a signed report to your primary care physician or the physician who referred you for the exam, who will discuss the results with you.

A negative cardiac CT scan for calcium scoring shows no calcification 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.

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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 (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.

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

Calcium Score	**Presence of CAD**
0	No evidence of CAD
1-10	Minimal evidence of CAD
11-100	Mild evidence of CAD
101-400	Moderate evidence of CAD
Over 400	Extensive evidence of CAD

If you have any questions or concerns, please call to speak to our technologist 713-776-9500.