



CORONARY ARTERY CALCIUM SCORING CT SCAN

For nearly 50% of Americans, the first symptom of coronary heart disease (CHD) is a heart attack. Unfortunately, some of the most common methods for detecting coronary heart disease are not designed to identify atherosclerotic plaque, one of the most predictive signs of the disease.

The most widely used method of predicting whether a patient has heart disease is the Framingham Risk Score (FRS) assessment. However, the FRS is limited in its value because it assesses only known risk factors, not atherosclerotic plaque. Stress testing cannot sufficiently detect heart disease in patients with no symptoms of heart disease.

The Coronary Artery Calcium Scoring (CACS) CT scan is a test designed to detect heart disease by imaging the coronary arteries for the accumulation of calcified plaque, a byproduct of cholesterol. CACS is a highly reliable test for the risk of heart attack. The American Heart Association has given the CACS a level II recommendation for patients who have an intermediate risk for heart disease.

What The Score Means

A patient's calcium score corresponds to a level of plaque:

- 0: No evidence of plaque**
- 1 - 100: Mild amount of plaque**
- 101 - 400: Moderate amount of plaque**
- Over 400: Extensive amount of plaque**

A score of zero suggests that there is no calcification within the coronary arteries, and that the chance of having a heart attack over the next 5 years is very low. All other scores mean that coronary artery disease is present in some degree. The higher the score, the more likely it is that the patient could suffer a heart attack or death in the coming years.

What Should You Do If A Patient Has A Score of More Than 400?

We believe that a patient with a score of 400 or more needs a cardiology consult because of the increased likelihood of coronary artery disease and heart attack.

To Whom Should You Recommend A Coronary Artery Calcium Scoring CT Scan?

Appropriate candidates for a CACS CT scan are **men over 35** and **women over 45** who have one of the risk factors below:

- are smokers
- have a family history of heart disease
- have high LDL-cholesterol levels
- have low HDL-cholesterol levels
- have high blood pressure
- are overweight
- are physically inactive

How Frequently Should Patients Have The Test?

Age, past medical history and other factors should be taken into consideration, but recent studies have indicated that repeat follow-up is generally necessary no sooner than every 2 to 3 years.

Conclusion

These data show that a CACS can modify predicted risk obtained from FRS alone, especially among patients in the intermediate-risk category in whom clinical decision-making is most uncertain.

The Patient Experience

The test is non-invasive, painless and typically takes less than half an hour to perform. Patients will be asked to remove all metal objects from their torso, neck and head.

Research

Although the Framingham Risk Score (FRS) is often recommended for all adults in order to guide preventive treatment, research shows that FRS combined with the CACS assessment provides better prognostic information than either alone.

Methodology

- Prospective observational population-based study of 1,461 asymptomatic adults with coronary risk factors
- Participants with at least 1 coronary risk factor (>45 years) underwent CT examination, were contacted yearly for up to 8.5 years, and were assessed for CHD
- This analysis included 1,312 participants with CACS results; excluded were 269 participants with diabetes and 14 with either missing data or who had a coronary event before CACS was performed
- Main outcome measure: Nonfatal myocardial infarction (MI) or CHD death

Results

- During a median of 7.0 years of follow-up, 84 patients experienced MI or CHD death; 70 patients died of any cause
- There were 291 (28%) participants with an FRS of more than 20% and 221 (21%) with a CACS of more than 300
- Compared with an FRS of less than 10%, an FRS of more than 20% predicted the risk of MI or CHD death (hazard ratio [HR], 14.3; 95% confidence interval [CI]; 2.0-104; P = .009)
- Compared with a CACS of zero, a CACS of more than 300 was predictive (HR, 3.9; 95% CI, 2.1-7.3; P<.001)
- Across categories of FRS, CACS was predictive of risk among patients with an FRS higher than 10% (P<.001) but not with an FRS less than 10%

Greenland P, et al. Coronary artery calcium score combined with Framingham score for risk prediction in asymptomatic individuals. JAMA January 14, 2004; 291:210-5.

If you have questions about the CACS CT scan or about a patient you believe may benefit from the test, please don't hesitate to call **Appleton Cardiology Associates** at **731-8900**.