Computed Tomography to Detect Coronary Artery Calcification

Coronary artery calcium (CAC) has been recognized to be associated with CAD on the basis of anatomic studies for decades. The development of fast CT scanners has allowed the measurement of CAC in clinical practice. CAC has been evaluated in several clinical settings. The most widely studied indication is for the use of CAC in the prediction of future risk for CAD in patients with subclinical disease, with the goal of instituting appropriate risk-reducing therapy (eg, statin treatment; lifestyle modifications) to improve outcomes. In addition, CAC has been evaluated in patients with symptoms potentially consistent with CAD, but in whom a diagnosis is unclear.

Several types of fast computed tomography (CT) imaging, including electron beam computed tomography (EBCT) and spiral CT, allow the quantification of calcium in coronary arteries. Coronary artery calcium (CAC) is associated with coronary artery disease (CAD). The use of CAC scores has been studied in the prediction of future risk of CAD and in the diagnosis of CAD in symptomatic patients.

EBCT (also known as ultrafast CT) and spiral CT (or helical CT) may be used as an alternative to conventional CT scanning due to their faster throughput, their speed of image acquisition gives them unique value for imaging of the moving heart. The rapid image acquisition time virtually eliminates motion artifact related to cardiac contraction, permitting visualization of the calcium in the epicardial coronary arteries. EBCT software permits quantification of calcium area and density, which are translated into calcium scores. Calcium scores have been investigated as a technique for detecting coronary artery calcification, both as a technique to diagnostic technique in symptomatic patients to determine the necessity of coronary angiography, or, in asymptomatic patients, as a screening technique for coronary artery disease.

EBCT and multi-detector computed tomography (MDCT) were initially the primary fast CT methods for measurement of coronary artery calcification. A fast CT study for coronary artery calcium measurement generally takes 10 to 15 minutes and requires only a few seconds of scanning time. More recently, CT angiography has been used to assess coronary calcium. Because of the basic similarity between EBCT and CT angiography in measuring coronary calcium, it is expected that CT angiography provides similar information on coronary calcium as does EBCT.

CT scan–derived coronary calcium measures have been used to evaluate coronary atherosclerosis. Coronary calcium is present in coronary atherosclerosis, but the atherosclerosis detected may or may not be causing ischemia or symptoms. Coronary calcium measures may be correlated with the presence of critical coronary stenoses or serve as a measure of the patient’s proclivity toward atherosclerosis and future coronary disease. Thus, it could serve as a variable to be used in a risk assessment calculation for the purposes of determining appropriate preventive treatment in asymptomatic patients. Alternatively, in other clinical scenarios, it might help determine whether there is atherosclerotic etiology or component to the presenting clinical problem in symptomatic patients, thus helping to direct further workup for the clinical problem. In this second scenario, a calcium score of zero usually indicates that the patient’s clinical problem is unlikely to be due to atherosclerosis and that other etiologies should be more strongly considered. In neither case does the test actually determine a specific diagnosis. Most clinical studies
Computed Tomography to Detect Coronary Artery Calcification

have examined the use of coronary calcium for its potential use in estimating the risk of future coronary heart disease (CHD) events.

Coronary calcium levels can be expressed in many ways. The most common method is the Agatston score, which is a weighted summed total of calcified coronary artery area observed on CT. This value can be expressed as an absolute number, commonly ranging from 0 to 400. These values can be translated into age and sex-specific percentile values. Different imaging methods and protocols will produce different values based on the specific algorithm used to create the score, but the correlation between any 2 methods appears to be high, and scores from 1 method can be translated into scores from a different method.

***Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.

Policy

BCBSNC will not provide coverage for Computed Tomography to Detect Coronary Artery Calcification. The use of computed tomography (e.g., electron beam CT, spiral or helical CT, multislice or multi-detector CT) to detect coronary artery calcification is considered investigational. BCBSNC does not cover investigational services or procedures.

Benefits Application

Please refer to Certificate for availability of benefits. This policy relates only to the services or supplies described herein. Benefits may vary according to benefit design, therefore certificate language should be reviewed before applying the terms of the policy.

When Computed Tomography to Detect Coronary Artery Calcification is covered

Not applicable.

When Computed Tomography to Detect Coronary Artery Calcification is not covered

Computed tomography to detect coronary artery calcification is considered investigational for all services, including:
- detection of coronary artery calcification as a screening examination for asymptomatic patients
- as a diagnostic study in symptomatic patients
- assessment of coronary artery bypass graft patency
- measurement of cardiac perfusion.

Policy Guidelines

There is extensive evidence on the predictive value of coronary artery calcium (CAC) score screening for cardiovascular disease among asymptomatic patients, and this evidence demonstrates that scanning has incremental predictive accuracy above traditional risk factor measurement. However, evidence from high quality studies that demonstrate that the use of CAC score measurement in clinical practice leads to changes in patient management or in individual risk behaviors that improve cardiac outcomes is lacking. At least 1 randomized controlled trial suggests that the use of CAC score measurement in clinical practice may be associated with improved cardiac risk profiles, but an association between CAC score measurement with improved outcomes has not yet been demonstrated in other studies.
Computed Tomography to Detect Coronary Artery Calcification

CAC scoring has a potential role as a diagnostic test to rule out coronary artery disease (CAD) in patients presenting with symptoms or as a “gatekeeper” test before invasive imaging is performed. Evidence from retrospective studies suggests that negative results on CAC scoring rules out coronary artery disease with good reliability, and at least 1 prospective study suggests that CAC score can be used in an emergency setting to stratify patients for further testing. However, further prospective trials would be needed to demonstrate that such a strategy is effective in practice and is at least as effective as alternate strategies for ruling out CAD. To demonstrate that use of calcium scores improves the efficiency or accuracy of the diagnostic workup of symptomatic patients, rigorous studies that define exactly how coronary calcium scores are used in combination with other tests in the triage of patients would be necessary. Retrospective and prospective studies have been mixed in their findings about whether CAC scores add incremental predictive value to cardiac computed tomography angiography findings in predicting outcomes for symptomatic patients with possible CAD.

Because of the lack of high-quality evidence demonstrating improved outcomes from the use of CAC score either as a screening test to risk stratify patients or as a diagnostic test to in symptomatic patients, the use of coronary artery calcium scoring is considered investigational.

Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable codes: S8092, 75571

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

From Policy titled: Electron Beam Computed Tomography for Imaging of Coronary Artery Disease
Blue Cross Blue Shield Association Policy, 6.01.03, reviewed 7/31/97
Medical Policy Advisory Group, 11/98
Medical Policy Advisory Group 12/2/1999
BCBSA Medical Policy Reference Manual 6.01.03, 8/15/01

Computed Tomography to Detect Coronary Artery Calcification


For Policy renamed: Computed Tomography to Detect Coronary Artery Calcification

BCBSA Medical Policy Reference Manual [Electronic Version]. 6.01.03, 12/14/05


Specialty Matched Consultant Advisory Panel review 10/2010


Computed Tomography to Detect Coronary Artery Calcification


Specialty Matched Consultant Advisory Panel review 10/2011


Specialty Matched Consultant Advisory Panel review 10/2012


Specialty Matched Consultant Advisory Panel review 10/2013

Medical Director review 10/2013

Taylor AJ, Cerqueira M, Hodgson JM et al. NCCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR 2010 appropriate use criteria for cardiac computed tomography. A report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the Society of Cardiovascular Computed Tomography, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the American Society of Nuclear Cardiology, the North American Society for Cardiovascular Imaging, the Society for Cardiovascular Angiography and Interventions, and the Society for Cardiovascular Magnetic Resonance.


Senior Medical Director review 11/2014

Computed Tomography to Detect Coronary Artery Calcification

Specialty Matched Consultant Advisory Panel review 10/2015
Medical Director review 10/2015

Policy Implementation/Update Information

<table>
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<tr>
<th>Date</th>
<th>Action</th>
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<tr>
<td>11/93</td>
<td>Evaluated: Investigational for detection of coronary artery calcification, assessment of coronary artery bypass graft patency and measurement of cardiac perfusion.</td>
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<tr>
<td>9/98</td>
<td>Reaffirmed. Association reviewed 7/31/97, no changes.</td>
</tr>
<tr>
<td>6/99</td>
<td>Reformatted, Description of procedure revised, Medical Term Definitions added.</td>
</tr>
<tr>
<td>12/99</td>
<td>Reaffirmed, Medical Policy Advisory Group</td>
</tr>
<tr>
<td>5/01</td>
<td>Policy key words added.</td>
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<tr>
<td>11/01</td>
<td>Coding format change.</td>
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<tr>
<td>9/02</td>
<td>Specialty Matched Consultant Advisory Panel review. No change to policy criteria.</td>
</tr>
<tr>
<td>1/03</td>
<td>Code S8092 added to policy. Removed 76120 from policy. Added statement to billing and coding section regarding the possible ordering of medical records. System coding changes.</td>
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<tr>
<td>3/04</td>
<td>Benefits Application and Billing/Coding sections updated for consistency.</td>
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<tr>
<td>7/15/04</td>
<td>Specialty Matched Consultant Advisory Panel review with no changes made to policy criteria. References added.</td>
</tr>
<tr>
<td>10/14/04</td>
<td>Code S8093 added to the Billing/Coding section.</td>
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<tr>
<td>12/15/05</td>
<td>Code S8093 removed from Billing/Coding section of the policy.</td>
</tr>
<tr>
<td>3/30/06</td>
<td>Specialty Matched Consultant Advisory Panel review 2/27/06. No changes made to policy criteria. Description of procedure expanded for clarity. Rationale added to Policy Guidelines. Policy number added to Key Words. References and CPT codes updated.</td>
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For Policy renamed: Computed Tomography to Detect Coronary Artery Calcification

<table>
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<tr>
<td>7/10/06</td>
<td>Added statement to description &quot;Although most of the research regarding imaging of coronary artery calcification has focused on EBCT, helical or spiral CT and multislice or multi-detector CT have also been used for this purpose.&quot; Policy statement clarified to read &quot;the use of computed tomography (e.g., electron beam CT, spiral or helical CT, multislice or multi-detector CT) to detect coronary artery calcification is considered investigational.&quot; Additional statement added to section When Electron Beam CT is Not Covered that indicates electron beam CT is not covered &quot;as a diagnostic study in symptomatic patients.&quot; Rationale for investigational status added to Policy Guidelines section. References updated. (adn)</td>
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<td>4/7/08</td>
<td>References updated. Specialty Matched Consultant Advisory Panel review 3/12/08. No change to policy statement. (adn)</td>
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<td>5/11/10</td>
<td>Description section extensively revised. Policy Guidelines and References updated. CPT codes 0144T, 0147T, 0149T deleted. CPT code 75571 added to the Billing/Coding section. (adn)</td>
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<td>6/22/10</td>
<td>Medical Policy number removed.</td>
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Computed Tomography to Detect Coronary Artery Calcification


8/30/11 Updated Policy Guidelines. Updated References. No changes to Policy Statements. (mco)


9/4/12 References updated. No changes to Policy Statements. (mco)


7/30/13 Description section updated. References updated. No changes to Policy Statement. (mco)


7/15/14 Description section updated. Policy Guidelines updated. References updated. No changes to Policy Statement. (mco)


3/10/15 Billing/Coding section updated to remove CPT codes: 75572, 75573, 75574. (td)


Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.