

**Cardiac and Coronary Artery Computed Tomography (CT) and
Computed Tomographic Angiography (CTA)
Policy Number: RA0203**

Background:

Computed tomographic angiography or CTA is a non-invasive imaging test that requires the use of intravenously administered contrast material and high-resolution, high-speed CT machinery to obtain detailed volumetric images of blood vessels. CTA can be applied to image blood vessels throughout the body; however to apply CTA in the coronary arteries, several technical challenges must be overcome to obtain high-quality diagnostic images. Very short image acquisition times are necessary to avoid blurring artifacts from the rapid motion of the beating heart. In some cases, premedication with beta-blocking agents is used to slow the heart rate below 60-65 beats per minute to facilitate adequate scanning, and electrocardiographic triggering or retrospective gating is used to obtain images during diastole when motion is reduced. Rapid scanning is also helpful so that the volume of cardiac images can be obtained during breathholding. Very thin sections (less than 1 mm) are important to provide adequate spatial resolution and high-quality 3D reconstruction images.

Two different CT technologies can achieve high-speed CT imaging. Electron beam CT (EBCT, ultrafast CT) uses an electron gun rather than a standard x-ray tube to generate x-rays, thus permitting very rapid scanning. Helical CT scanning (spiral CT) also creates images at greater speed than conventional CT by continuously rotating a standard x-ray tube around the patient so that data are gathered in a continuous spiral or helix rather than individual slices. Multidetector row helical CT scanning (MDCT) or multislice CT (MSCT) is a technological evolution of helical CT, which uses CT machines equipped with an array of multiple x-rays detectors that can simultaneously image multiple sections of the patient during rapid volumetric image acquisition. MDCT machines may have 4, 8, 16, 40, or up to 64 detectors.

Coronary CTA has been proposed as a noninvasive alternative to invasive coronary angiography. Potential applications include but are not limited to evaluation of obstructive coronary artery disease (CAD), coronary artery bypass graft patency, coronary artery stent patency, coronary artery aneurysm, delineation of coronary artery anomaly and functional cardiac assessment.

Coverage:

Coverage is provided for CT angiography of the chest for cardiac assessment (applicable CPT codes include 0145T - 0151T) for the following indications:

1. Congenital heart disease
 - a. For assessment of complex congenital heart disease, including anomalies of the cardiac chambers and valves
2. Coronary Artery Anomalies
 - a. For accurate identification of anomalous coronary arteries to determine the need for surgery, depending on the specific anomaly
3. Evaluation of chest pain syndrome in patients with an intermediate pre-test probability of coronary artery disease when **all** of the following criteria are met:
 - a. The patient presents with typical angina or angina equivalent (for example, shortness of breath and exercise-induced pain in the abdominal region, back, jaw, shoulder and/or arm) symptoms that the physician believes may result from obstructive coronary artery disease; **and**
 - b. The patient has an intermediate pre-test probability of coronary artery disease based on age, gender, and the character of the chest pain; **and**
 - c. CTA is used instead of stress imaging testing (such as a Myocardial Perfusion Imaging or Stress Echocardiography) or is used to clarify a non-diagnostic or equivocal finding on stress imaging

4. Known coronary artery disease (CAD), with new or recurrent symptoms meeting criteria under **both** a. and b. below:
 - a. The patient is being evaluated for one of the following clinical situations
 - i. known CAD, when the cause of new symptoms is uncertain; **or**
 - ii. known CAD, when recurrence of symptoms may be related to progression/exacerbation of underlying disease; **or**
 - iii. for evaluation in patients with a history of prior revascularization [Coronary Artery Bypass Graft (CABG) Surgery or Intracoronary Stent], who present with chest pain, dyspnea or other symptoms related to cardiac disease, to determine stent patency and severity of possible graft stenosis;
 - and**
 - b. Results of the non-invasive CTA study will guide the decision concerning a repeat invasive procedure
5. Equivocal stress test results in symptomatic patients with suspected coronary artery disease
 - a. To facilitate management decisions in symptomatic patients with suspected coronary artery disease and equivocal stress (or stress imaging) results, when coronary angiography either cannot be safely performed or when it is expected that non-invasive CTA may obviate the need for further assessment with invasive coronary angiography
6. Further evaluation of Intra-Cardiac and Para-Cardiac Masses and Tumors
 - a. For either of the following indications following inconclusive or abnormal echocardiography, or when echocardiography is not feasible:
 - i. To define the size, internal characteristics and site of origin for intra-cardiac and para-cardiac mass lesions; **OR**
 - ii. To assess for cardiac invasion by a malignant neoplasm
7. Intra-cardiac thrombus
 - a. For further evaluation of intra-cardiac thrombus following inconclusive or abnormal echocardiography, or when echocardiography is not feasible
8. Coronary venous anatomy evaluation when all of the following criteria are met:
 - a. Cardiac CT is being performed for noninvasive coronary vein mapping prior to one of the following cardiac interventional procedures
 - i. pacemaker lead placement in the lateral coronary vein to resynchronize cardiac contraction in patients with heart failure, or
 - ii. biventricular pacemaker lead placement; **and**
 - b. There is documentation of referral for cardiac CT by a cardiologist
9. Pulmonary venous anatomy evaluation for patients with atrial fibrillation when both of the following criteria are met:
 - a. For pre-procedural anatomic mapping of the pulmonary veins, prior to catheter ablation of electrical activity from the pulmonary veins, as treatment for recurrent atrial fibrillation; and for post-procedural assessment for possible complications, such as pulmonary vein stenosis
 - b. There is documentation of referral for cardiac CT by a cardiologist
10. Cardiac surgical evaluation (non-coronary artery surgery)
 - a. For patients being evaluated for non-coronary artery cardiac surgery (including, but not limited to, valvular and ascending aortic surgery), when invasive angiography would otherwise be necessary for pre-operative evaluation, and the necessary pre-operative information can be obtained using non-invasive CTA

Limitations and Exclusions:

1. Cardiac CT/coronary artery CTA is never covered for screening --- i.e., in the absence of signs and/or symptoms of disease.
2. The selection of the test must be made within the context of other testing modalities so that the resulting information facilitates the management decision, and does not merely add an additional layer of testing.
3. Cardiac/coronary artery CTA is not covered when used for cardiac evaluation of a patient with extensive disease where there is a pre-test knowledge of extensive calcification that would diminish the interpretive value. It is considered not

medically necessary in this situation.

4. Coverage of this modality for coronary artery assessment is limited to devices that process thin, high resolution slices (0.75 mm or less). The multidetector scanner must have 40 to 64 slice capability.

5. The administration of beta-blockers and/or other medications and the monitoring of the patient by a physician during cardiac/coronary artery CTA are not separately payable services.

6. A physician experienced in and familiar with this technique must order all cardiac/coronary CTA studies.

7. A physician or qualified non-physician provider must be present during testing whenever cardioactive agents or contrast agents are administered (direct physician supervision). Ideally, this supervising physician will be experienced in this procedure and ACLS-certified.

8. This policy does not apply to use of computed tomography for detection of coronary artery calcification (applicable CPT codes include 0144T, 0147T and 0149T). That specific application of ultrafast CT technology is addressed in the following Claims Processing Contractor medical policy adopted for use by the State Health Plan: BCBSNC Medical Policy RAD5050, Computed Tomography to Detect Coronary Artery Calcification (available at www.bcbsnc.com).

Authority:

G.S. 58-50-61(12) (Def of Med Nec)

G.S. 135-40.1(17a) (Def of EXP/INV)

G.S. 135-40.6(5a)

G.S. 135-40.1(7a)

G.S. 135-40.1(7a)

G.S. 135-40.7(5a)

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