# MEDICAL POLICY

| MEDICAL POLICY DETAILS | |
|---|---|
| **Medical Policy Title** | **Cardiac Computed Tomography (CCT)/Coronary Computed Tomographic Angiography (CCTA)** |
| **Policy Number** | **6.01.34** |
| **Category** | **Technology Assessment** |
| **Original Effective Date** | **06/16/05** |
| **Committee Approval Date** | **09/21/06, 09/20/07, 09/18/08, 09/17/09, 06/17/10, 06/16/11, 07/19/12, 10/17/13, 06/19/14, 01/22/15, 04/21/16, 06/15/17, 06/21/18, 07/18/19, 10/22/20, 08/19/21, 04/21/22, 04/20/23, 12/21/23, 11/21/24** |
| **Current Effective Date** | **03/17/25** |
| **Archived Date** | **N/A** |
| **Archive Review Date** | **N/A** |
| **Product Disclaimer** | • *Services are contract dependent; if a product excludes coverage for a service, it is not covered, and medical policy criteria do not apply.*<br>• *If a commercial product (including an Essential Plan or Child Health Plus product), medical policy criteria apply to the benefit.*<br>• *If a Medicaid product covers a specific service, and there are no New York State Medicaid guidelines (eMedNY) criteria, medical policy criteria apply to the benefit.*<br>• *If a Medicare product (including Medicare HMO-Dual Special Needs Program (DSNP) product) covers a specific service, and there is no national or local Medicare coverage decision for the service, medical policy criteria apply to the benefit.*<br>• *If a Medicare HMO-Dual Special Needs Program (DSNP) product DOES NOT cover a specific service, please refer to the Medicaid Product coverage line.* |

## POLICY STATEMENT

I. Based upon our criteria and assessment of the peer-reviewed literature, coronary computed tomographic angiography (CCTA), is considered **medically appropriate** for **ANY** of the following:
   A. For new, recurrent or worsening likely anginal symptoms as defined by chest, epigastric, shoulder, arm/jaw pain, chest pressure/discomfort;
   B. For new, recurrent or worsening symptoms of chest pain, exertional dyspnea, or exertional fatigue and **ANY** of the following:
      1. Persistent symptoms after a normal stress test;
      2. Equivocal, borderline, abnormal or discordant prior noninvasive evaluation where obstructive coronary artery disease (CAD) remains a concern (less than 90 days);
      3. Abnormal rest ECG findings, such as a new left bundle branch block (LBBB), or T-wave inversions, when ischemia is a concern; or
      4. A prior coronary artery bypass graft (CABG) when only a graft patency is a concern;
   C. Evaluation of an individual under 40 years of age for suspected anomalous coronary artery(ies) or for the treatment planning when there is a history of **one or more** of the following:
      1. Syncopal episodes during strenuous activities;
      2. Persistent chest pain brought on by exertion or emotional stress, and normal stress test;
      3. Full sibling(s) with history of sudden death syndrome before age 40 or with documented anomalous coronary artery;
      4. Resuscitated sudden death and contraindications for conventional coronary angiography; or
      5. Prior nondiagnostic coronary angiography in determining the course of anomalous coronary artery in relation to the great vessels, origin of a coronary artery, or bypass graft location; or

D. Initial imaging study for individuals with hypertrophic cardiomyopathy and stable anginal symptoms;
E. Individuals who have recovered from unexplained sudden cardiac arrest in lieu of invasive coronary angiography when **both** of the following are determined:
   1. confirm the presence or absence of ischemic heart disease; and
   2. exclude the presence of an anomalous coronary artery;
F. Evaluation of newly diagnosed congestive heart failure or cardiomyopathy with **ALL** of the following:
   1. No prior history of coronary artery disease, the ejection fraction is less than 50%, and low or intermediate risk on the pre-test probability assessment;
   2. No contraindications to cardiac CT angiography; and
   3. No cardiac catheterization, single-photon emission CT (SPECT), cardiac positron emission tomography (PET), or stress echocardiogram has been performed since the diagnosis of congestive heart failure or cardiomyopathy;
G. Unclear coronary artery anatomy despite conventional cardiac catheterization;
H. Re-do coronary artery bypass grafting (CABG) for **either** of the following:
   1. Assess bypass graft patency; or
   2. To evaluate the location of the left internal mammary artery (LIMA) and/or right internal mammary artery (RIMA) prior to repeat bypass surgery; or
I. To evaluate left main stent one time at six (6) to twelve (12) months;
J. Pre-Procedural planning for Percutaneous Coronary Intervention (PCI) of Chronic Total Occlusion (CTO);
K. To evaluate coronary artery anomalies and other complex congenital heart diseases of cardiac chambers or great vessels;
L. Cardiac CTA will replace conventional invasive coronary angiography for the following indications:
   1. Ventricular Tachycardia (six (6) beat runs or greater);
   2. Delayed presentation or retrospective evaluation of suspected Takotsubo syndrome (stress cardiomyopathy); or
   3. Preoperative assessment of the coronary arteries in planned surgery for **any** of the following:
      a. aortic dissection;
      b. aortic aneurysm;
      c. valvular surgery; or
      d. liver transplant (for initial pre-treatment evaluation and may be repeated once in three (3) years);
M. To assess coronary involvement in individuals with systemic vasculitis (e.g., Giant Cell Arteritis, Takayasu's, Kawasaki's disease) when there are clinical features suggestive of underlying vasculitis including:
   1. Unexplained elevated cardiac markers (erythrocyte sedimentation rate, C-reactive protein).
   2. Constitutional symptoms (fevers, chills, night sweats, weight loss).
   3. Multiple visceral infarcts in the absence of embolic etiology;
N. Cardiac trauma;
O. Preoperative assessment for planned liver or kidney transplant.

Fractional Flow Reserve by CT

II. Based upon our criteria and assessment of the peer-reviewed literature, the use of noninvasive fractional flow reserve (FFR) is considered **medically appropriate** to further assess CAD seen on a recent coronary CTA that is of uncertain physiologic significance.

Evaluation of Cardiac Structure and Morphology

III. Based upon our criteria and assessment of the peer-reviewed literature, CT of the heart, is considered **medically appropriate** for the evaluation of cardiac structure and morphology for **ANY** of the following:
   A. Cardiac vein identification for lead placement in left ventricular pacing.
   B. Evaluation of the anatomy of the pulmonary veins prior to a pulmonary vein isolation (ablation) procedure for atrial fibrillation.
   C. If echocardiogram was performed and is inconclusive:

1. cardiac or pericardial mass or tumor;
2. cardiac thrombus;
3. pericarditis or constrictive pericarditis;
4. complications of cardiac surgery.

D. In place of magnetic resonance imaging (MRI) when there is clinical suspicion of suspected arrhythmogenic right ventricular dysplasia (ARVD) or arrhythmogenic cardiomyopathy (ARVC) with presyncope or syncope, when clinical suspicion is supported by established criteria for ARVD.
E. Recurrent laryngeal nerve palsy due to cardiac chamber enlargement.
F. In place of transesophageal echocardiogram (TEE) for assessment of left atrial appendage (LAA) occlusion device or to assess for thrombus.

Congenital Heart Disease

IV. Based upon our criteria and assessment of the peer-reviewed literature, CT of the heart for congenital heart disease is considered **medically appropriate** for **ANY** of the following:
A. Coronary artery anomaly evaluation, when a cardiac catheterization was performed, and not all coronary arteries were identified.
B. Thoracic arteriovenous anomaly evaluation, when a cardiac MRI or chest CT angiogram was performed and suggested congenital heart disease.
C. Complex adult congenital heart disease evaluation, when:
1. There was not a cardiac CT or cardiac MRI performed, and there is a contraindication to cardiac MRI, or
2. A cardiac CT or cardiac MRI was performed one (1) or more years ago.

Transcatheter Aortic Valve Replacement (TAVR)

V. Based upon our criteria and assessment of the peer-reviewed literature, the following imaging is **medically appropriate** for pre-aortic valve replacement to determine if the individual is a candidate for TAVR:
A. Cardiac CT- to measure the aortic annulus; or
B. Coronary CTA- to measure the aortic annulus and assess the coronary arteries in lieu of heart catheterization.

VI. Based upon our criteria and assessment of the peer-reviewed literature, cardiac CT Post-TAVR is considered **medically appropriate** for **ANY** of the following: (See policy guidelines regarding hypoattenuated leaflet thickening [HALT])
A. Post-TAVR Transthoracic Echocardiography (TTEs) is indeterminate or raises concerns about valve thrombosis, infective endocarditis, or structural degeneration; or
B. When a valve in valve implantation or surgical re-do AVR Is being contemplated.

VII. Based upon our criteria and assessment of the peer-reviewed literature, the use of automated quantification and characterization of coronary atherosclerotic plaque via cardiac CT and CTA is considered **investigational**.

VIII. Based upon our criteria and assessment of the peer-reviewed literature, cardiac CTA is considered **investigational** for all other indications.

*Refer to Corporate Medical Policy #6.01.13 Coronary Calcium Scoring*

*Refer to Corporate Medical Policy #11.01.03 Experimental or Investigational Services*

*Refer to Corporate Medical Policy #11.01.10 Clinical Trials*

## POLICY GUIDELINES

I. Ischemic evaluation symptoms can be defined as the following:
   A. Cardiac chest pain/pressure/tightness (likely anginal symptoms): Chest, epigastric, shoulder, arm, jaw pain, chest pressure/discomfort occurring with exertion or emotional stress and relieved by rest, nitroglycerin, or both.
   B. Less likely anginal symptoms: Symptoms including dyspnea or fatigue when not exertional and not relieved by rest/nitroglycerin; also includes generalized fatigue or chest discomfort occurring in a time course not suggestive of angina (e.g., resolves spontaneously within seconds or lasts for an extended period and is unrelated to exertion).
   C. Noncardiac explanation: An alternative diagnosis, such as gastroesophageal reflux, chest trauma, anemia, chronic obstructive pulmonary disease, or pleurisy, is present and is the most likely explanation for the patient's symptoms.
   D. Anginal equivalents (individuals with previously documented CAD only):
      - Symptoms consistent with individual's known angina pattern in an individual with a history of CABG or PCI.
      - Fatigue (overwhelming sense of exhaustion causing a decreased capacity for physical activity or mental work).

II. Cardiac CT for routine surveillance or follow up post-TAVR, for incidental hypoattenuated leaflet thickening (HALT) with or without restricted leaflet motion, also known as hypoattenuation Affecting Motion (HAM) is NOT recommended.

III. The Diamond Forrester pre-test probability of CAD is a statistical tool used in the initial assessment of stable chest pain syndromes to estimate the likelihood that the symptoms are caused by obstructive coronary artery disease using the individual's description of the symptoms, their age, and sex assigned at birth.
   - Link to calculator: https://qxmd.com/calculate/calculator_32/pretest-probablity-of-cad

## DESCRIPTION

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. 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 breath-holding. Very thin sections (less than 1 mm) are important to provide adequate spatial resolution and high-quality three-dimensional reconstruction images.

Cardiac CTA has been proposed as a noninvasive alternative to invasive coronary angiography (ICA). 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.

Fractional flow reserve (FFR) is the ratio between the maximum blood flow in a narrowed artery and the maximum blood flow in a normal artery. The HeartFlow FFRCT (HeartFlow, Inc., Redwood City, CA) is coronary physiologic simulation software that has been approved by the U.S. Food and Drug Administration (FDA) to provide a non-invasive method of estimating FFR using standard coronary CTA image data.

Automated quantification and characterization of coronary atherosclerotic plaque is a service in which coronary computed tomographic angiography (CTA) data are analyzed using computerized algorithms to assess the extent and severity of

coronary artery disease. The use of automated quantification and characterization of coronary atherosclerotic plaque is considered investigational at this time.

## RATIONALE

Contrast-enhanced cardiac CTA can be performed using either multidetector-row CT (MDCT) or electron beam CT (EBCT). Multiple manufacturers have received Section 510(k) clearance from the FDA to market MDCT machines equipped with at least 16 detector rows, and at least two models of EBCT machines have been cleared by the FDA under Section 510(k). Intravenous iodinated contrast agents used for cardiac CTA have also received FDA approval.

Prospective studies with small sample sizes reflect that cardiac CTA is a promising noninvasive method for assessment of coronary stents, detection of in-stent restenosis and occlusion, and evaluating bypass patency. Studies with small sample sizes also conclude that the presence of myocardial hypoenhancement on cardiac CTA in acute chest pain patients has a high-positive predictive value and specificity, but only moderate sensitivity for presence of acute or healed MI. Additional studies conclude that the presence and size of early perfusion defects and late enhancement on cardiac CTA is closely related to follow-up segment myocardial dysfunction and myocardial functional recovery. Available studies recommend that further studies be conducted, to evaluate the clinical value of these preliminary findings in larger patient populations.

Current studies consist of patient populations with a high pretest probability of CAD. Patients providing suboptimal images are often excluded from calculations of test accuracy. Future studies will need to examine these tests in larger, less-selected populations representing the clinical settings in which they are expected to be used.

Guidelines for the Evaluation and Diagnosis of Chest Pain: A Report of the American College of Cardiology/American Heart Association Joint Committee on clinical Practice Guidelines (Gulati et al., 2021) provides recommendations and algorithms for clinicians to assess and diagnose chest pain in adult patients. The recommendations are as follows:

- For intermediate-risk patients with acute chest pain and no known CAD eligible for diagnostic testing after a negative or inconclusive evaluation for Acute Coronary Syndrome (ACS), CCTA is useful for exclusion of atherosclerotic plaque and obstructive CAD (1A recommendation).
- For intermediate-risk patients with acute chest pain and known nonobstructive CAD, CCTA can be useful to determine progression of atherosclerotic plaque and obstructive CAD (2a recommendation).
- For intermediate-high risk patients with stable chest pain and no known CAD, CCTA is effective for diagnosis of CAD, for risk stratification, and for guiding treatment decisions (1A recommendation).
- For intermediate-high risk patients with stable chest pain after an inconclusive or abnormal exercise ECG or stress imaging study, CCTA is reasonable (2a recommendation).
- For patients who have stable chest pain with previous coronary revascularization, CCTA is reasonable to evaluate bypass graft or stent patency (for stents ≥3 mm) (2a recommendation).
- For patients who have had prior CABG surgery presenting with stable chest pain who are suspected to have myocardial ischemia, it is reasonable to perform stress imaging or CCTA to evaluate for myocardial ischemia or graft stenosis or occlusion (2a recommendation).
- For symptomatic patients with known nonobstructive CAD who have stable chest pain, CCTA is reasonable for determining atherosclerotic plaque burden and progression to obstructive CAD, and guiding therapeutic decision-making (2a recommendation)

The 2018 American Heart Association (AHA)/American College of Cardiology(ACC) Guidelines for the management of Adults with Congenital Heart Disease recommendations are as follows:

- CCT imaging can be useful in patients with adult congenital heart disease (ACHD) when information that cannot be obtained by other diagnostic modalities is important enough to justify the exposure to ionizing radiation (2a recommendation).
- Cardiovascular magnetic resonance (CMR), CCT, and/or transesophageal echocardiography (TEE) are useful to evaluate pulmonary venous connections in adults with ASD (1 recommendation).

In 2017, the National Institute for Health and Care Excellence (NICE) endorsed non-invasive FFR using coronary CTA (FFR-CT), stating, "The committee concluded that the evidence suggests that HeartFlow FFRCT is safe, has high diagnostic accuracy, and that its use may avoid the need for invasive investigations." For correct use, HeartFlow FFRCT requires access to 64-slice (or above) coronary CT angiography facilities. The American College of Cardiology CathPCI Registry (Messenger et al., 2017) also announced that it will allow FFRCT as an acceptable noninvasive method of documenting ischemia around the time of revascularization. Documentation of ischemia around the time of revascularization is important to the appropriate use criteria (AUC) for percutaneous coronary interventions (PCI).

In a multicenter, randomized trial conducted by Hong (2021), the study was to evaluate whether the success rate of percutaneous coronary intervention (PCI) for total occlusion (CTO) increased with pre-procedural CCTA. A total of 400 individuals with CTO were randomized to receive PCI with pre-procedural CCTA or without CCTA. Successful recanalization was achieved in 187 patients (93.5%) in the coronary CTA–guided group and in 168 patients (84.0%) in the angiography-guided group. Coronary perforations occurred in 2 (1%) and 8 patients (4%) in the coronary CTA- and angiography-guided groups, respectively. Periprocedural myocardial infarction was not observed in the coronary CTA–guided group, whereas it occurred in 4 patients (2%) in the angiography-guided group. Total procedure and fluoroscopic times were not different. There were no differences between the groups in the occurrences of cardiac death, target vessel–related myocardial infarction, or target vessel revascularization at 1 year.

## CODES

- *Eligibility for reimbursement is based upon the benefits set forth in the member's subscriber contract.*
- *CODES MAY NOT BE COVERED UNDER ALL CIRCUMSTANCES. PLEASE READ THE POLICY AND GUIDELINES STATEMENTS CAREFULLY.*
- *Codes may not be all inclusive as the AMA and CMS code updates may occur more frequently than policy updates.*
- *Code Key: Experimental/Investigational = (E/I), Not medically necessary/appropriate = (NMN)*

**CPT Codes**

| Code | Description |
|---|---|
| 75572 | Computed tomography, heart, with contrast material, for evaluation of cardiac structure and morphology (including 3D image postprocessing, assessment of cardiac function, and evaluation of venous structures, if performed) |
| 75573 | Computed tomography, heart, with contrast material, for evaluation of cardiac structure and morphology in the setting of congenital heart disease (including 3D image postprocessing, assessment of left ventricular (LV) cardiac function, right ventricular (RV) structure and function and evaluation of vascular structures, if performed) |
| 75574 | Computed tomographic angiography, heart, coronary arteries and bypass grafts (when present), with contrast material, including 3D image postprocessing (including evaluation of cardiac structure and morphology, assessment of cardiac function, and evaluation of venous structures, if performed) |
| 75580 | Noninvasive estimate of coronary fractional flow reserve (FFR) derived from augmentative software analysis of the data set from a coronary computed tomography angiography, with interpretation and report by a physician or other qualified health care professional |

| Code | Description |
|---|---|
| 0623T **(E/I)** | Automated quantification and characterization of coronary atherosclerotic plaque to assess severity of coronary disease, using data from coronary computed tomographic angiography; data preparation and transmission, computerized analysis of data, with review of computerized analysis output to reconcile discordant data, interpretation and report |
| 0624T **(E/I)** | data preparation and transmission |
| 0625T **(E/I)** | computerized analysis of data from coronary computed tomographic angiography |
| 0626T **(E/I)** | review of computerized analysis output to reconcile discordant data, interpretation and report |



**HCPCS Codes**

| Code | Description |
|---|---|
| No specific code(s) | |

**ICD10 Codes**

| Code | Description |
|---|---|
| Numerous codes | |

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*Key Article

## KEY WORDS

Cardiac CTA, Coronary artery CTA, calcium scoring.

## CMS COVERAGE FOR MEDICARE PRODUCT MEMBERS

There is currently a Local Coverage Determination (LCD) for Cardiac Computed Tomography (CCT) and Coronary Computed Tomography Angiography (CCTA) (L33559). Please refer to the following LCD website for Medicare members:[https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?LCDId=33559&DocID=L33559 ] accessed 10/08/24.

There is currently a Local Coverage Determination (LCD) for Non-Invasive Fractional Flow Reserve (FFR) for Ischemic Heart Disease (L39075). Please refer to the following LCD website for Medicare members: [https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=39075&ver=14&] accessed 10/08/24.