MEDICAL POLICY

Medical Policy Title	**Cardiac Computed Tomography (CCT)/Coronary Computed Tomographic Angiography (CCTA)**
Policy Number	**6.01.34**
Current Effective Date	**October 15, 2025**
Next Review Date	**September 2026**

Our medical policies are based on the assessment of evidence based, peer-reviewed literature, and professional guidelines. Eligibility for reimbursement is based upon the benefits set forth in the member's subscriber contract. (Link to Product Disclaimer)

POLICY STATEMENT(S)

I. 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, unexplained exertional dyspnea, or fatigue and **any** of the following:
  1. Symptoms persist after a normal stress test;
  2. Equivocal, borderline, abnormal or discordant prior noninvasive evaluation since the onset of symptoms where obstructive coronary artery disease (CAD) remains a concern;
  3. New abnormal rest ECG findings since the onset of symptoms, such as a new left bundle branch block (LBBB), or T-wave inversions (not including isolated T wave inversion in III or leads v1-2), when ischemia is a concern;
  4. A prior history of coronary artery bypass graft (CABG) when the only concern is for graft patency;
  5. Individual has undergone an urgent evaluation (ER or urgent care) of the symptoms since the onset;
  6. History of cardiac transplant (i.e., concern for transplant vasculopathy);
  7. History of chest radiation;
  8. Coronary artery calcium (CAC) score greater than 100; **or**
  9. 50 years or older with two (2) or more active risk factors:
     a. diabetes mellitus
     b. smoking;
     c. family history of premature coronary artery disease (CAD);
     d. hypertension; **or**

e. dyslipidemia;

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 (1) 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, for any of the following:
      a. anomalies of origin:
         i. left coronary artery (LCA) or the right coronary artery (RCA) arising from the pulmonary artery; **or**
         ii. interarterial course between the pulmonary artery and the aorta of either the RCA arising from the left sinus of the Valsalva or the LCA arising from the right sinus of Valsalva;
      b. anomalies of course:
         i. myocardial bridging; **or**
      c. anomalies of termination:
         i. coronary artery fistula.

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. Evaluation of structural heart disease for the use of class IC antiarrhythmic agent (flecainide or propafenone) in lieu of stress test with imaging;

I. Ventricular tachycardia (VT) (3-beat runs or greater), exercise induced VT or Ventricular fibrillation (VF);

J. 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;

K. To evaluate left main stent one time at six (6) to twelve (12) months;

L. Pre-Procedural planning for Percutaneous Coronary Intervention (PCI) of Chronic Total Occlusion (CTO);

M. To evaluate coronary artery anomalies and other complex congenital heart diseases of cardiac chambers or great vessels;

N. Cardiac CTA will replace conventional invasive coronary angiography for **either** of the following indications:

1. Delayed presentation or retrospective evaluation of suspected Takotsubo syndrome (stress cardiomyopathy); **or**
2. 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);

O. 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 **any** of the following:

1. Unexplained elevated cardiac markers (erythrocyte sedimentation rate, C-reactive protein).

2. Constitutional symptoms (fevers, chills, night sweats, weight loss); **or**
3. Multiple visceral infarcts in the absence of embolic etiology;

P. Cardiac trauma;

Q. Preoperative assessment for planned liver or kidney transplant.

Fractional Flow Reserve by CT (FFR-CT)

II. Noninvasive FFR-CT is considered **medically appropriate** to further assess CAD seen on a recent coronary CTA that is of uncertain physiologic significance.

Coronary CTA Plaque Quantification

III. Coronary CT plaque quantification or coronary plaque analysis using data from CCTA is **medically necessary** when **ALL** of the following conditions exist:

A. The individual has acute or stable chest pain with no known coronary artery disease (CAD);

B. Results from the current completed and interpreted CCTA indicate **any** of the following risk categories:

1. Intermediate risk;
2. CAD-RADS 1;
3. CAD-RADS 2; **or**
4. CAD-RADS 3;

C. Cardiac evaluation is negative or inconclusive for acute coronary syndrome non-indications.

IV. Coronary CTA plaque quantification or coronary plaque analysis using data from CCTA is **not medically necessary** in **ANY** of the following clinical scenarios:

A. Unstable coronary syndromes;

B. In conjunction with invasive coronary catheterization;

C. For the purpose of screening or disease surveillance;

D. Within 30 days of a myocardial infarction;

E. Current completed and interpreted CCTA documents with **any** of the following results:

1. Normal CCTA;
2. CAD-RADS-0;
3. High-grade stenosis (>70%);
4. CAD-RADS 4; **or**
5. CAD-RADS 5.

CT Heart for Evaluation of Cardiac Structure and Morphology

V. 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 (post-procedure between 3-6 months after ablation);
   C. If echocardiogram was performed and is inconclusive for **all** of the following:
      1. Cardiac or pericardial mass or tumor;
      2. Cardiac thrombus;
      3. Pericarditis or constrictive pericarditis; **and**
      4. Complications of cardiac surgery;
   D. In place of magnetic resonance imaging (MRI) when there is clinical suspicion supported by established criteria for arrhythmogenic right ventricular dysplasia (ARVD) of **any** of the following:
      1. Suspected ARVD;
      2. Arrhythmogenic ventricular cardiomyopathy (ARVC) with presyncope or syncope; **or**
   E. Recurrent laryngeal nerve palsy due to cardiac chamber enlargement;
   F. Prior to planned valvular interventions (TAVR, TMVR, and TTVR) in patients with radiation-induced valve disease;
   G. In place of transesophageal echocardiogram (TEE) for assessment of left atrial appendage (LAA) occlusion device or to assess for thrombus for **any** of the following:
      1. Pre-procedural evaluation with or without 3D imaging;
      2. Repeat imaging 45 days post-procedure;
      3. Another follow-up study is medically necessary before the one (1) year surveillance when imaging study at 45 days shows a peri-device gap greater or equal to 5mm or device related thrombus, usually at 3-6 months; **or**
      4. One (1) year post procedure.

<u>CT Heart for Congenital Heart Disease</u>

VI. 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, for **either** of the following:

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.

CT Imaging in Transcatheter Aortic Valve Replacement (TAVR)

VII. The following imaging is **medically appropriate** for pre-aortic valve replacement to determine if the individual is a candidate for TAVR for **either** of the following:

A. Cardiac CT to measure the aortic annulus;

B. Coronary CTA to measure the aortic annulus and assess the coronary arteries in lieu of heart catheterization.

VIII. 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;

B. When a valve in valve implantation or surgical re-do AVR is being contemplated.

IX. Cardiac CTA is considered **investigational** for all other indications.

RELATED POLICIES

Corporate Medical Policy

6.01.13 Coronary Calcium Scoring

11.01.03 Experimental or Investigational Services

11.01.10 Clinical Trials

POLICY GUIDELINE(S)

I. Evidence documenting the presence of obstructive CAD includes **ANY** of the following:

A. Prior heart catheterization or CCTA revealing **any** of the following:

1. ≥40% stenosis of the left main coronary artery;
2. ≥50% stenosis for other major epicardial vessels;
3. Significant stenosis defined by and FFR of ≤0.80; **or**
4. History of a prior PCI or CABG.

II. Evidence documenting the presence of non-obstructive CAD includes prior heart catheterization or CCTA revealing **ANY** of the following:

A. <40% stenosis of the left main coronary artery;

B. <50% stenosis for other major epicardial vessels;

C. FFR >0.80.

III. The Coronary Artery Disease Reporting and Data System (CAD-RADS) classification of percentage luminal diameter coronary artery stenosis on coronary CT angiography (CCTA) is as follows:

A. CAD-RADS 0: 0%

B. CAD-RADS 1: 1 to 24%

C. CAD-RADS 2: 25 to 49%

D. CAD-RADS 3: 50 to 69%

E. CAD-RADS 4: 70 to 99% or ≥50% left main coronary artery stenosis

F. CAD-RADS 5: 100% (total occlusion)

IV. 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.

V. 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: [accessed 2025 Aug 27] Available from: https://qxmd.com/calculate/calculator_32/pretest-probablity-of-cad

DESCRIPTION

Ischemic Evaluation Symptoms

- Likely anginal symptoms (angina pectoris, typical angina, cardiac chest pain)
  - Chest, epigastric, shoulder, arm, jaw pain, chest pressure/discomfort occurring with exertion or emotional stress which is relieved by rest, nitroglycerin, or both.
- 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).
- Non-cardiac 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.

- 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).

Other Signs and Symptoms Suggestive of Potential Cardiac Etiology

- Dyspnea;
- Orthopnea;
- Paroxysmal nocturnal dyspnea;
- Heartburn unrelated to meals/nausea and vomiting;
- Palpitations;
- Syncope;
- Heart failure.

Computed Tomographic Angiography (CCTA)

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 CCTA image data.

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

SUPPORTIVE LITERATURE

Rinehart et al (2024) reported the results of the DECODE study. The study evaluated the clinical utility of HeartFlow's Artificial Intelligence Plaque Analysis (AI-QCPA) tool, and the effects it has on clinical decision making. This retrospective study involved 100 patients and evaluated their coronary CT angiography (CCTA) scans that were used to create initial treatment plans. Results showed that after reviewing AI-generated plaque quantification data, reclassification rate (RR) occurred in 66% of patients, RR ranged from 47% in cases with CACS 0 to 96% in cases with CACS >400, and from 40% in CAD-RADS 1 cases to 94% in CAD-RADS 4 cases. RR was higher in cases with coronary stenoses ≥50% (89.5%) vs cases with stenoses <50%. RR was 39% in cases with <70 mg/dl vs 60% in LDLD ≥70 mg/dl. Following the review of the CCTA images rather than the CCTA report, the RR was 50%. The finding showed that the incorporation of AI-QCPA information into CCTA reporting has the potential to better align treatment strategies with patient risk.

Barbosa et al (2023) conducted a systematic review and meta-analysis that compared effectiveness of CCTA with the standard of care (SOC) in patients with acute chest pain. Twenty-two randomized control trials (RCTs) were included (n=4956 patients who underwent CCTA, n=4423 patients who received SOC). Results reported that there was a 14% reduction in the length of stay and a 17% reduction in immediate costs for the CCTA arm compared with the SOC arm. In group 1, the length of stay was 17% shorter and costs were 21% lower using CCTA. There was no evidence of differences in referrals to invasive coronary angiography, myocardial infarction, mortality, rate of hospitalization, further stress testing, or readmissions between CCTA and SOC arms. There were more revascularizations (relative risk, 1.45) and medication changes (relative risk, 1.33) in participants with low-to-intermediate acute coronary syndrome risk and increased radiation exposure in high-risk participants (mean difference, 7.24 mSv) in the CCTA arm compared with the SOC arm. The meta-regression analysis found significant differences between CCTA and SOC arms for rate of hospitalization, further stress testing, and medication changes depending on the type of SOC. Authors support the use of CCTA as it is safe, fast and less expensive in short-term to exclude ACS in low- to intermediate patients presenting with acute chest pain.

Gray et al (2021) conducted an open-label RCT to determine if the use of early CCTA improves one-year clinical outcomes in 1748 intermediate-risk patients with suspected acute coronary syndrome (ACS). Participants were randomized into two groups, receive early CCTA (n=877) and SOC (n=871). The primary endpoint was all cause death or subsequent type 1 or 4b Myocardial infarction (MI) at 1 year, and it occurred in 51 (5.8%) patients in the early CCTA group compared with 53 (6.1%) patients in the SOC group. The authors stated that the findings did not support the routine use of early CCTA in intermediate risk patients with acute chest pain and suspected ACS.

Smulders et al (2020) published a 3-arm, prospective, open-label RCT that compared cardiovascular magnetic resonance imaging (CMR) or CCTA as a gatekeeper for ICA with a control strategy (i.e., routine clinical care) in 207 patients with non-ST-segment elevation myocardial infarction (NSTEMI). The CMR- and CTA-first strategies reduced ICA compared with routine clinical care (87%, 66%, and 100%, respectively), with similar outcome (hazard ratio: CMR vs. routine, 0.78; CTA vs. routine, 0.66; and CMR vs. CTA, 1.19). Obstructive coronary artery disease after ICA was found in 61% of patients in the routine clinical care arm, in 69% in the CMR-first arm, and in 85% in the CTA-first arm. In the non-CMR and non-CTA arms, follow-up CMR and CTA were performed in 67% and 13% of patients and led to a new diagnosis in 33% and 3%, respectively. The authors reported that implementing CMR or CTA first when diagnosing non-ST-segment elevation MI is a safe gatekeeper. This was a single-center study and the authors state that it requires validation in a multicenter setup.

Maurovich-Horvat et al (2022) reported the results of the Diagnostic Imaging Strategies for Patients with Stable Chest Pain and Intermediate Risk of Coronary Artery Disease (DISCHARGE) trial. It is a randomized trial comparing CT with ICA as initial diagnostic imaging strategies to guide treatment in patients with stable chest pain who have the probability of obstructive CAD. The primary outcome was major adverse cardiovascular events (cardiovascular death, nonfatal myocardial infarction, or nonfatal stroke) over 3.5 years. Key secondary outcomes were procedure related complications and angina pectoris. The trial had 3561 patients with follow-up completed in 3523 of them. Major adverse cardiovascular events occurred in 38 of the 1808 patients (21%) in the CT group, and in 52 of 1753 (3.0%) in the ICA group. Angina in the final 4 weeks of follow-up was reported in 8.8% of patients in the CT group and in 7.5% of those in the ICA group.

Stillman et al (2020) reported results from the Randomized Evaluation of Patients with Stable Angina Comparing Utilization of Noninvasive Examinations (RESCUE) trial. The trial randomized 1050 patients from 44 sites with stable angina and suspected CAD. Participants were randomized to CCTA (n=518) or single photon emission CT myocardial perfusion imaging (SPECT-MPI) (n=532) to direct patients to optimal medical therapy alone or optimal medical therapy with revascularization. The primary endpoint was first major adverse cardiovascular events (MACE) (cardiac death or MI), or revascularization. Study has a mean follow-up period of 16.2 months. In patients with a negative CCTA there was one acute MI; in patients with a negative SPECT examination there were two acute MIs; and for positive CCTA and SPECT, one acute MI each. CCTA segment involvement by a stenosis of ≥50% diameter was a better predictor of MACE and revascularization at 1 year than the percent reversible defect size by SPECT myocardial perfusion imaging. Four (1.2%) patients with negative CCTA compared with 14 (3.2%) with negative SPECT had MACE or revascularization. The authors concluded that CCTA was a better predictor of MACE and revascularization. Limitations to the study include modest adherence rates to optimal medial therapy (OMT), follow-up time was modest, and decreased sample size.

Hong et al (2021) conducted a multicenter, randomized trial. 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.

Hoffman et al (2017) evaluated the results from the prospective, randomized, multicenter PROMISE trial which assessed the prognostic value of noninvasive cardiovascular testing in patients with stable chest pain. The authors recognize the lack of data from randomized trials comparing anatomic with functional testing for determining optimal management of patients with stable chest pain. In the PROMISE trial, patients with stable chest pain and intermediate pretest probability for obstructive CAD were randomly assigned to functional testing (exercise electrocardiography, nuclear stress, or stress echocardiography) or CCTA. The primary end point was death, myocardial infarction, or unstable angina hospitalizations over a median follow-up of 26.1 months. The frequency of normal test results and incidence rate of events in these patients were significantly lower among 4500 patients randomly assigned to CTA in comparison with 4602 patients randomly assigned to functional testing. In CTA, 54.0% of events (n=74/137) occurred in patients with non-obstructive CAD (1%-69% stenosis). The frequency of obstructive CAD and myocardial ischemia was low (11.9%versus 12.7%, respectively), with both findings having similar prognostic value (95% CI, 2.60-5.39; and 3.47; 95% CI, 2.42-4.99). When test findings were stratified as mildly, moderately, or severely abnormal, hazard ratios for events in comparison with normal tests increased proportionally for CTA (2.94, 7.67, 10.13) but not for corresponding functional testing categories (0.94, 2.65, 3.88). They found that anatomic assessment with CCTA provided significantly better prognostic information compared to function testing. They noted that adding the Framingham Risk Score to functional test results significantly improved the prognostic value of functional testing. If 2714 patients with at least an intermediate Framingham Risk Score (>10%) who had a normal functional test were reclassified as being mildly abnormal, the discriminatory capacity improved to 0.69 (95% CI, 0.64-0.74). The authors stated that contemporary stable chest pain populations present with a low prevalence of myocardial ischemia and obstructive CAD, and CCTA in that population provides better prognostic information than functional testing. In addition, the authors concluded that in this population, the detection of non-obstructive CAD identifies additional at-risk patients while consideration of the Framingham Risk Score is important for proper risk stratification of patients with normal stress testing.

PROFESSIONAL GUIDELINE(S)

The Society of Cardiovascular Computed Tomography issued an expert consensus document in 2021 recommending CCTA for the following:

- Evaluation of stable coronary artery disease:
  - Native vessels
  - Post revascularization

- Fractional flow reserve or CT myocardial perfusion imaging
- Coronary anomalies
- Artery evaluation prior to noncoronary cardiac surgery.

The guidelines for the Evaluation and Diagnosis of Chest Pain: A Report of the American College of Cardiology (ACC)/American Heart Association (AHA) Joint Committee on clinical Practice Guidelines (Gulati et al 2021) provide 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 2012 ACCF/AHA/American College of Physicians (ACP)/ American Association for Thoracic Surgery (AATS)/ Preventive Cardiovascular Nurses Association (PCNA)/ Society for Cardiovascular Angiography and Interventions (SCAI)/ Society of Thoracic Surgeons (STS) Guideline for the Diagnosis and Management of Patients with Stable Ischemic Heart Disease recommend the following:

- CCTA might be reasonable for patients with an intermediate pretest probability of ischemic heart disease (IHD) who have at least moderate physical functioning or no disabling comorbidity. (Level of Evidence: B)
- CCTA is reasonable for patients with a low to intermediate pretest probability of IHD who are incapable of at least moderate physical functioning or have disabling comorbidity with any of the following. (Level of Evidence: B)
    - CCTA is reasonable for patients with an intermediate pretest probability of IHD who have continued symptoms with prior normal test findings;
    - Have inconclusive results from prior exercise or pharmacological stress testing;
    - Are unable to undergo stress with nuclear MPI or echocardiography. (Level of Evidence: C)

The 2010 ACCF/AHA Guidelines for the Assessment of Cardiovascular Risk in Asymptomatic Adults recommend:

- Coronary computed tomography angiography (CCTA) is not recommended for cardiovascular risk assessment in asymptomatic adults. (Level of Evidence: C)

REGULATORY STATUS

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 (2) 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.

CODE(S)

- Codes may not be covered under all circumstances.
- Code list may not be all inclusive (AMA and CMS code updates may occur more frequently than policy updates).
- (E/I)=Experimental/Investigational
- (NMN)=Not medically necessary/appropriate

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
0623T	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	data preparation and transmission
0625T	computerized analysis of data from coronary computed tomographic angiography
0626T	review of computerized analysis output to reconcile discordant data, interpretation and report

HCPCS Codes

Code	Description
Not Applicable	

ICD10 Codes

Code	Description
Multiple Codes	

REFERENCES

Ates AH, et al. Long-term prognostic value of coronary atherosclerotic plaque characteristics assessed by computerized tomographic angiography. Angiology. 2021;72(3):252-259.

Barbosa MF, et al. Comparative effectiveness of coronary CT angiography and standard of care for evaluating acute chest pain: a living systematic review and meta-analysis. Radiol Cardiothorac Imaging. 2023 Aug 24;5(4):e230022.

Bluemke DA, et al. Noninvasive coronary artery imaging. Magnetic resonance angiography and multidetector computed tomography angiography. A scientific statement from the American Heart Association Committee on Cardiovascular Imaging and Intervention of the Council on Cardiovascular Radiology and Intervention, and the Councils on Clinical Cardiology and Cardiovascular Disease in the Young. Circulation. 2008 Jul 29;118(5):586-606.

Cerrato E, et al. Revascularization deferral of nonculprit stenoses on the basis of fractional flow reserve: 1-year outcomes of 8,579 patients. JACC Cardiovasc Interv. 2020 Aug 24;13(16):1894-1903.

Cheng XS, et al. Coronary Computed Tomography Angiography in Diagnosing Obstructive Coronary Artery Disease in Patients with Advanced Chronic Kidney Disease: A Systematic Review and Meta-Analysis. Cardiorenal Med. 2021;11(1):44-51.

Cheng XS, et al. Emerging evidence on coronary heart disease screening in kidney and liver transplantation candidates: a scientific statement from the American Heart Association. Circulation. 2022 Oct. 146:e299–e324.

Cury RC, et al. CAD-RADS™ 2.0 - 2022 Coronary Artery Disease - Reporting and Data System.: An expert consensus document of the Society of Cardiovascular Computed Tomography (SCCT), the American College of Cardiology (ACC), the American College of Radiology (ACR) and the North America Society of Cardiovascular Imaging (NASCI). J Am Coll Radiol. 2022 Nov;19(11):1185-1212.

Dewey M, et al. CT or invasive coronary angiography in stable chest pain: the DISCHARGE trial group. New England Journal of Medicine. 2022; DOI: 10.1056/NEJMoa2200963.

Dundas J, et al. Interaction of AI-Enabled Quantitative Coronary Plaque Volumes on Coronary CT Angiography, FFR_{CT}, and Clinical Outcomes: A Retrospective Analysis of the ADVANCE Registry. Circ Cardiovasc Imaging. 2024 Mar;17(3):e016143.

Earls JP, et al. ACR Appropriateness Criteria® chronic chest pain – high probability of coronary artery disease. J Am Coll Radiol. 2011 Oct;8(10):679-86.

Fihn SD, et al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of

Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2012; 60(24):e44-e164.

Gershin E, et al. 16-MDCT coronary angiography versus invasive coronary angiography in acute chest pain syndrome: a blinded prospective study. AJR Am J Roentgenol. 2006 Jan;186(1):177-84.

Goldstein JA, et al. The CT-STAT (Coronary Computed Tomographic Angiography for Systematic Triage of Acute Chest Pain Patients to Treatment) trial. J Am Coll Cardiol. 2011 Sep;58(14):1414-22.

Gray AJ, et al. Early computed tomography coronary angiography in patients with suspected acute coronary syndrome: randomised controlled trial. BMJ. 2021 Sep 29;374:n2106.

Griffin WF, et al. AI Evaluation of Stenosis on Coronary CTA, Comparison With Quantitative Coronary Angiography and Fractional Flow Reserve: A CREDENCE Trial Substudy. JACC Cardiovasc Imaging. 2023 Feb;16(2):193-205.

Gulati M, et al. 2021 AHA/ACC/ASE/CHEST/SAEM/ SCCT/SCMR Guideline for the evaluation and diagnosis of chest pain. J Am Coll Cardiol. 2021;78(22):e187-e285.

Hamilton-Craig C, et al. Diagnostic performance and cost of CT angiography versus stress ECG- a randomized prospective study of suspected acute coronary syndrome chest pain in the emergency department (CT-COMPARE). In J Cardiol. 2014 Oct 22;177(3):867-73.

Halvorsen S, et al. ESC Scientific Document Group. 2022 ESC Guidelines on cardiovascular assessment and management of patients undergoing non-cardiac surgery. Eur Heart J. 2022 Oct 14;43(39):3826-3924.

Hoffmann U, et al. Coronary computed tomography angiography for early triage of patients with acute chest pain. J Am Coll Cardiol. 2009;53(18):1642–50.

Hoffmann U, et al. Prognostic value of noninvasive cardiovascular testing in patients with stable chest pain: insights from the PROMISE Trial (Prospective multicenter imaging study for evaluation of chest pain). Circulation. 2017 Jun 13;135(24):2320-2332.

Hong SJ, et al. Effect of coronary CTA on chronic total occlusion percutaneous coronary intervention: a randomized trial. JACC Cardiovasc Imaging. 2021 Oct;14(10):1993-2004.

Hulten E, et al. Outcomes after coronary computed tomography angiography in the emergency department; a systematic review and meta-analysis of randomized, controlled trials. J Am Coll Cardiol. 2013;61(8):880-92.

Hulten EA, et al. Prognostic evaluation of cardiac computed tomography angiography: a systematic review. J Am Coll Cardiol. 2011;57(10):1237-47.

Jaltotage B, et al. Coronary computed tomographic angiography derived findings and risk score improves the allocation of lipid lowering therapy compared to clinical score. Medicine. 2022;101(6).

Joglar JA, et al. 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial

Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2024 Jan 2;149(1):e1-e156.

Jones RL, et al. Safe and rapid disposition of low-to-intermediate risk patients presenting tot the emergency department with chest pain: a 1-year high-volume single-center experience. J Cardiovasc Comput Tomogr. 2014 Sep-Oct;8(5):375-83.

Ko BS, et al. Non-invasive CT-derived fractional flow reserve and static rest and stress CT myocardial perfusion imaging for detection of haemodynamically significant coronary stenosis. The International Journal of Cardiovascular Imaging. 2019; 35:2103-2112.

Korsholm K, et al. Expert recommendations on cardiac computed tomography for planning transcatheter left atrial appendage occlusion. J Am Coll Cardiol. Intv 2020;13:277-292.

Liang S, et al. The added value of coronary CTA in chronic total occlusion percutaneous coronary intervention: a systematic review and meta-analysis. Eur Radiol. 2024 Jun;34(6):4041-4052.

Linde JJ, et al. Cardiac computed tomography guided treatment strategy in patients with recent acute-onset chest pain: results from the randomised, controlled trial: CArdiac cT in the treatment of acute CHest pain (CATCH). Int J Cardiol. 2013 Oct 15;168(6):5257-62.

Löffler AI, et al. Coronary Computed Tomography Angiography Demonstrates a High Burden of Coronary Artery Disease Despite Low-Risk Nuclear Studies in Pre-Liver Transplant Evaluation. Liver Transpl. 2020 Nov;26(11):1398-1408.

Lopez-Mattei J, et al. Cardiac computed tomographic imaging in cardio-oncology: An expert consensus document of the Society of Cardiovascular Computed Tomography (SCCT). Endorsed by the International Cardio-Oncology Society (ICOS). J Cardiovasc Comput Tomogr. 2023 Jan-Feb;17(1):66-83.

Lowenstern A, et al. Age-Related Differences in the Noninvasive Evaluation for Possible Coronary Artery Disease: Insights from the Prospective Multicenter Imaging Study for Evaluation of Chest Pain (PROMISE) Trial. JAMA Cardiology. 2020;5(2):193-201.

Matsumoto H, et al. Standardized volumetric plaque quantification and characterization from coronary CT angiography: a head-to-head comparison with invasive intravascular ultrasound. Eur Radiol. 2019 Nov;29(11): 6129–6139.

Maurovich-Horvat P, et al. CT or invasive coronary angiography in stable chest pain. N Engl J Med. 2022 Apr 28;386(17):1591-1602.

Mehta P, et al. Major adverse cardiac events after emergency department evaluation of chest pain patients with advanced testing: Systematic review and meta-analysis. Acad Emerg Med. 2021;00:1-17.

McKavanagh P, et al. A comparison of cardiac computerized tomography and exercise stress electrocardiogram test for the investigation of stable chest pain: the clinical results of the CAPP randomized prospective trial. Eur Heart J Cardiovasc Imaging. 2015 Apr;16(4):441-8.

Muhlestein JB, et al. Effect of screening for coronary artery disease using CT angiography on mortality and cardiac events in high-risk patients with diabetes: the FACTOR-64 randomized clinical trial. JAMA. 2014 Dec 3;312(21):2234-43.

National Institute for Health and Care Excellence. HeartFlow FFRCT for estimating fractional flow reserve from coronary CT angiography [MTG32] [Internet]. Published Feb 2017. [Updated 2021 May; accessed 2025 Jul 01]. Available from: https://www.nice.org.uk/guidance/mtg32

Narula J, et al. SCCT 2021 expert consensus document on coronary computed tomographic angiography: a report of the society of cardiovascular computed tomography. J Cardiovasc Comput Tomogr. 2021 May-Jun;15(3):192-217.

Nielsen LH, et al. The diagnostic accuracy and outcomes after coronary computed tomography angiography vs conventional functional testing in patients with stable angina pectoris: a systematic review and meta-analysis. Eur Heart J Cardiovasc Imaging. 2014 Sep;15(9):961-71.

Nurmohamed NS, et al. AI-Guided Quantitative Plaque Staging Predicts Long-Term Cardiovascular Outcomes in Patients at Risk for Atherosclerotic CVD. JACC Cardiovasc Imaging. 2024 Mar;17(3):269-280.

Park GM, et al. Coronary computed tomographic angiographic findings in asymptomatic patients with type 2 diabetes mellitus. Am J Cardiol. 2014 Mar 1;113(5):765-71.

Park JK, et al. Multidetector computed tomography for the evaluation of coronary artery disease; the diagnostic accuracy in calcified coronary arteries, comparing with IVUS imaging. Yonsei Med J. 2014 May 1;55(3):599-605.

Patel MR, et al. 1-Year Impact on Medical Practice and Clinical Outcomes of FFRCT: The ADVANCE Registry. JACC: Cardiovascular Imaging. 2020 Jan;13:97-105.

Rinehart S, et al. Utility of Artificial Intelligence Plaque Quantification: Results of the DECODE Study. J Soc Cardiovasc Angiogr Interv. 2024 Mar 26;3(3Part B):101296.

Sara L, et al. Accuracy of multidetector computed tomography for detection of coronary artery stenosis in acute coronary syndrome compared with stable coronary disease: A CORE64 multicenter trial substudy. Int J Cardiol. 2014 Dec 15;177(2):385-91.

Shah AB, et al. ACR Appropriate Criteria Chronic Chest Pain-Noncardiac Etiology Unlikely-Low to Intermediate Probability of Coronary Artery Disease. J Am Coll Radiol. 2018 Nov;15(11S):S283-S290.

Sharma A, et al. Stress testing versus CT angiography in patients with diabetes and suspected coronary artery disease. J Am Coll Cardiol. 2019 Mar;73(8):893-902.

Smulders MW, et al. Initial imaging-guided strategy versus routine care in patients with non-ST-segment elevation myocardial infarction. J Am Coll Cardiol. 2019 Nov 19;74(20):2466-2477.

Stillman AE, et al. Coronary computed tomography angiography compared with single photon emission computed tomography myocardial perfusion imaging as a guide to optimal medical therapy in patients presenting with stable angina: The RESCUE Trial. J Am Heart Assoc. 2020 Dec

15;9(24):e017993.

Stout KK, et al. 2018 AHA/ACC Guideline for the management of adults with congenital heart disease: executive summary: a report of the American college of cardiology/American heart association task force on clinical practice guidelines. J Am Coll Cardiol. 2019;73(12):1494-1563.

Sun Z, et al. Coronary CT angiography: current status and continuing challenges. Br J Radiol. 2012 May;85(1013):495-510.

Taylor AJ, et al. ACCF/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. J Am Coll Cardiol. 2010;56:1864-94.

Truong QA, et al. Coronary computed tomography imaging in women: an expert consensus statement from the Society of Cardiovascular Computed Tomography. J Cardiovasc Comput Tomogr. 2018 Nov-Dec;12(6):451-466.

Vrints C, et al. 2024 ESC Guidelines for the management of chronic coronary syndromes. Eur Heart J. 2024 Sep 29;45(36):3415-3537.

Wever-Pinzon O, et al. Coronary computed tomography angiography for the detection of cardiac allograft vasculopathy: a meta-analysis of prospective trials. J Am Coll Cardiol. 2014;63(19):1992-2004.

Wieske V, et al. Computed tomography angiography versus Agatston score for diagnosis of coronary artery disease in patients with stable chest pain: individual patient data meta-analysis of the international COME-CCT Consortium. European Radiology. 2022; 32:523-5245.

Wolk MJ, et al. ACCF/AHA/ASE/ASNC/HFSA/SCAI/SCCT/SCMR/STS 2013 multimodality appropriate use criteria for the detection and risk assessment of stable ischemic heart disease: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Card Fail. 2014 Feb;20(2):65-90.

Zeb I, et al. Coronary computed tomography as a cost-effective test strategy for coronary artery disease assessment- a systematic review. Atherosclerosis. 2014 Feb 24;234(2):426-435.

SEARCH TERMS

Not Applicable

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)

Cardiac Computed Tomography (CCT) and Coronary Computed Tomography Angiography (CCTA) (LCD L33559) [accessed 2025 Jun 30]

Non-Invasive Fractional Flow Reserve (FFR) for Ischemic Heart Disease (LCD L39075) [accessed 2025 Jun 30]

PRODUCT DISCLAIMER

- Services are contract dependent; if a product does not cover a service, medical policy criteria do not apply.
- If a commercial product (including an Essential Plan or Child Health Plus product) covers a specific service, medical policy criteria apply to the benefit.
- 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.
- 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.
- 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 HISTORY/REVISION

Committee Approval Dates

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, 09/18/25

Date	Summary of Changes
09/18/25	• Annual review, new criteria for CCTA. New medically necessary criteria for Coronary CTA plaque quantification.
01/01/25	• Summary of changes tracking implemented.
06/16/05	• Original effective date