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## Subject: Computed Tomography (CT) Heart

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### DESCRIPTION:

Computed tomography (CT) heart (cardiac CT) can be used to evaluate the anatomy and pathology of the pericardium and cardiac chambers and assessment of the central great vessels and heart function, including the cardiac valves. Cardiac CT is also useful in detecting and characterizing cardiac and pericardial disorders, such as masses and pericardial fluid. CT is a form of medical imaging that involves the exposure of patients to ionizing radiation. CT should only be performed under the supervision of a physician with training in radiation protection to optimize examination safety. Radiation exposure should be taken into account when considering the use of this technology. This guideline addresses the use of heart CT in the outpatient setting.

**Summary and Analysis of Evidence:** Cardiac computed tomography (CT) is a well-established noninvasive cross-sectional imaging modality most commonly used to assess coronary arteries. It provides comprehensive information on the anatomy, function, and pathology of the cardiac structures, and pericardium. Cardiac CT is performed primarily for the morphologic evaluation of the coronary arteries and veins, cardiac chambers, valves, ventricular myocardium, aortic root, central pulmonary arteries and veins, and pericardium. Non-contrast cardiac CT is performed primarily for detecting and evaluating calcification, such as that of the coronary arteries (coronary calcium scoring), ascending aorta, cardiac valves, pericardium, or cardiac masses. Electrocardiogram (ECG) synchronization reduces motion artifact and is required for coronary calcium quantification. It may also be performed for cardiac surgical planning in preoperative patients. Indications for contrast-enhanced cardiac CT include, but are not limited to, the diagnosis, characterization, and/or surveillance and procedural planning of: coronary atherosclerotic and nonatherosclerotic disease, cardiac and vascular congenital anomalies and variants, follow-up of corrected or palliated congenital heart disease and assessment of postoperative complications (shunt/conduit stenosis, thrombosis, pseudoaneurysms) in children and adults, coronary interventions (endovascular and surgical, e.g., angioplasty, coronary stenting, coronary artery bypass grafts [CABGs], pulmonary vein ablation therapy for cardiac dysrhythmia, valve replacement, aortic root replacement, planning for aortic endovascular valve replacement, pacemaker placement planning), cardiac masses including thrombi pericardial diseases, intracardiac thrombi, congenital cardiovascular

anomalies, including but not limited to the following: coronary artery anomalies, systemic and pulmonary venous anomalies, aortic and pulmonary anomalies, right-sided and left-sided cardiac obstructive disorders, atrial and ventricular septal defects (ACR–NASCI–SPR, 2021).

## POSITION STATEMENT:

Cardiac computed tomography (heart CT) **meets the definition of medically necessity** for the following indications:

### **Congenital heart disease**

- Congenital lesions: prior to planned repair and for change in clinical status and/or new concerning signs or symptoms
- Patent ductus arteriosus: routine surveillance (1-2 years) in a member with postprocedural aortic obstruction
- Aortic stenosis or regurgitation: routine surveillance (6-12 months) in a child with aortic sinus and/or ascending aortic dilation with increasing size
- Aortic coarctation and interrupted aortic arch:
  - Routine surveillance (3–5 years) in a child or adult with mild aortic coarctation
  - Post procedure (surgical or catheter-based) routine surveillance (3–5 years) in an asymptomatic member to evaluate for aortic arch aneurysms, in-stent stenosis, stent fracture, or endoleak
- Tetralogy of Fallot:
  - Routine surveillance (2–3 years) in a member with valvular or ventricular dysfunction, right ventricular outflow tract obstruction, branch pulmonary artery stenosis, arrhythmias, or presence of a right ventricle to pulmonary artery (RV-to-PA) conduit
- D-Loop transposition of the great arteries (post-operative):
  - Routine surveillance (3–5 years) in an asymptomatic member
  - Routine surveillance (1–2 years) in a member with dilated aortic root with increasing size, or aortic regurgitation
  - Routine surveillance (3–12 months) in a member with  $\geq$  moderate systemic aortic valve (AV) regurgitation, systemic right ventricular (RV) dysfunction, left ventricular outflow tract (LVOT) obstruction, or arrhythmias
- Congenitally corrected transposition of the great arteries:
  - Unrepaired: routine surveillance (3–5 years) in an asymptomatic member
  - Postoperative: routine surveillance (3–5 years) in an asymptomatic member
  - Postoperative anatomic repair: routine surveillance (6–12 months) in a member with valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, or presence of a right ventricle to pulmonary artery (RV-to-PA) conduit
  - Postoperative physiological repair with VSD closure and/or LV-to-PA conduit: routine surveillance (3–12 months) in a member with  $\geq$  moderate systemic AV valve regurgitation, systemic RV dysfunction, and/or LV-to-PA conduit dysfunction
- Truncus arteriosus: routine surveillance (1–2 years) in an asymptomatic child or adult with  $\geq$  moderate truncal stenosis and/or regurgitation

- Single-ventricle heart disease: post-operative routine surveillance (3–5 years) in an asymptomatic member.

Note: For the above indications, either computed tomography (CT) or cardiac magnetic resonance imaging (CMR) may be performed.

### **Cardiomyopathy**

- Quantification of myocardial (muscle) mass (computed tomography (CT) or cardiac magnetic resonance (CMR))
- Assessment of right ventricular morphology in suspected arrhythmogenic right ventricular cardiomyopathy, based upon other findings such as:
  - Nonsustained ventricular tachycardia (VT)
  - Unexplained syncope
  - Electrocardiogram (ECG) abnormalities
  - First-degree relative with positive genotype of arrhythmogenic right ventricular cardiomyopathy (ARVC).

### **Valvular heart disease**

- Characterization of native or prosthetic valves with clinical signs or symptoms suggesting valve dysfunction, when transthoracic echocardiogram (TTE), transesophageal echocardiogram (TEE) and/or fluoroscopy have been inadequate.
- Evaluation of right ventricular (RV) function in severe tricuspid regurgitation (TR), including systolic and diastolic volumes when transthoracic echocardiogram (TTE) images are inadequate and cardiac magnetic resonance (CMR) is not readily available.
- Pulmonary hypertension in the absence of valvular disease.
- Evaluation of suspected infective endocarditis with moderate to high pretest probability (i.e. staphylococcal bacteremia, fungemia, prosthetic heart valve, intracardiac device) when transthoracic echocardiogram (TTE) and transesophageal echocardiogram (TEE) have been inadequate.
- Evaluation of suspected paravalvular infections when the anatomy cannot be clearly delineated by transthoracic echocardiogram (TTE) and transesophageal echocardiogram (TE).

### **Evaluation of intra and extracardiac structures**

- Evaluation of cardiac mass, suspected tumor or thrombus, or cardiac source of emboli including valvular mass or vegetation when imaging with transthoracic echocardiogram (TTE) and transesophageal echocardiogram (TEE) have been inadequate
- Re-evaluation of prior findings for interval change when a change in therapy is anticipated
- Evaluation of pericardial anatomy, when transthoracic echocardiogram (TTE) and/or transesophageal echocardiogram (TEE) are inadequate.

### **Electrophysiologic procedure planning**

- Evaluation of pulmonary venous anatomy prior to radiofrequency ablation of atrial fibrillation.
- For follow up when needed for evaluation of pulmonary vein stenosis
- Non-invasive coronary vein mapping prior to placement of biventricular pacing leads.

### Transcatheter structural intervention planning

- Evaluation for transcatheter aortic valve replacement (TAVR)
- When transthoracic echocardiogram (TTE) and transesophageal echocardiogram (TEE) cannot provide adequate imaging, CT imaging can be used for planning: robotic mitral valve repair, atrial septal defect closure, left atrial appendage closure, ventricular septal defect closure, endovascular grafts, and percutaneous pulmonic valve implantation
- Evaluation for suitability of transcatheter mitral valve procedures alone or in addition to TEE.

### Aortic pathology

- Computed tomography (CT), magnetic resonance (MR) or echocardiogram can be used for screening and follow up with CT and MR preferred for imaging beyond the proximal ascending thoracic aorta for the following:
  - Evaluation of dilated aortic sinuses or ascending aorta identified by TTE
  - Suspected acute aortic pathology, such as dissection
  - Screening first degree relatives of members with a history of thoracic aortic aneurysm or dissection or an associated high-risk mutation for thoracic aneurysm in common
  - Screening second degree relative of a member with thoracic aortic aneurysm when the first degree relative has aortic dilation, aneurysm, or dissection
  - Six months follow up after initial finding of a dilated thoracic aorta, for assessment of rate of change
  - Annual follow up of enlarged thoracic aorta that is above top normal for age, gender, and size up to 4.4 cm
  - Biannual (twice/yr.) follow up of enlarged aortic root  $\geq 4.5$  cm ( $> 4.5$  cm for bicuspid aortic valve) or showing growth rate  $\geq 0.5$  cm/year.
- Members with Marfan may undergo annual imaging with CT, MRI or TTE with increase to biannual (twice-yearly) when diameter  $\geq 4.5$  cm or when expansions is  $> 0.5$  cm/yr
- Members with Turner's syndrome should undergo initial imaging with (CT, MRI or TTE, for evidence of dilatation of the ascending thoracic aorta. If imaging is normal and there are no risk factors for aortic dissection, repeat imaging should be performed every 5-10 years or if otherwise indicated. If the aorta is enlarged, appropriate follow-up imaging should be done according to size, as noted above.
- Evaluation of the aorta in the setting of a known or suspected connective tissue disease or genetic condition that predisposes to aortic aneurysm or dissection (i.e. Loeys-Dietz, Ehlers-Danlos), with re-evaluation at 6 months for rate of expansion. Complete evaluation with CMR from the cerebrovascular circulation to the pelvis is recommended with Loeys-Dietz syndrome.

### Suggested Follow-up of Aortic Pathologies After Repair or Treatment

Pathology	Interval	Study
Acute dissection	Before discharge, 1 mo., 6 mo., yearly	CT or MR, chest plus abdomen TTE
Chronic dissection	Before discharge, 1 y., 2 to 3 y.	CT or MR, chest plus abdomen TTE

Aortic root repair	Before discharge, yearly	TTE
AVR plus ascending	Before discharge, yearly	TTE
Aortic arch	Before discharge, 1 y. 2 to 3 y.	CT or MR, chest plus abdomen
Thoracic aortic stent	Before discharge, 1 mo., 2 mo., 6 mo., yearly or 30 days*	CXR, CT, chest plus abdomen
Acute IMH/PAU	Before discharge, 1 mo., 3 mo., yearly	CT or MR, chest plus abdomen

\*US Food and Drug Administration stent graft studies usually required before discharge or at 30-day CT scan to detect endovascular leaks. If there is concern about a leak, a pre-discharge study is recommended; however, the risk of renal injury should be borne in mind. All patients should be receiving beta blockers after surgery or medically managed aortic dissection, if tolerated. Adapted from: Erbel et al (359)

Abbreviations: AVR: aortic valve replacement; CT: computed tomographic imaging; CXR: chest x-ray; IMH: intramural hematoma; MR: magnetic resonance imaging; PAU: penetrating atherosclerotic ulcer; TTE: transthoracic echocardiography

Adapted from Erbel R, Alfonso F, Boileau C, et al. Diagnosis and management of aortic dissection. Eur Heart J. 2001;22:1642–81.

**BILLING/CODING INFORMATION:**

**CPT Coding:**

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 venous structures, if performed)

**REIMBURSEMENT INFORMATION:**

**Request for a follow-up study**

A follow-up study may be needed to help evaluate a patient’s progress after treatment, procedure, intervention or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.

**LOINC Codes:**

The following information may be required documentation to support medical necessity: physician history and physical, physician progress notes, plan of treatment, laboratory studies and reason for computed tomography (heart CT).

Documentation Table	LOINC Codes	LOINC Time Frame Modifier Code	LOINC Time Frame Modifier Codes Narrative
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Physician history and physical	28626-0	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Attending physician progress note	18741-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Plan of treatment	18776-5	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology reason for study	18785-6	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology comparison study-date and time	18779-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology comparison study observation	18834-2	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology-study observation	18782-3	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology-impression	19005-8	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology study-recommendation (narrative)	18783-1	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim

## PROGRAM EXCEPTIONS:

**Federal Employee Plan (FEP):** Follow FEP guidelines.

### Medicare Advantage products

The following Local Coverage Determination (LCD) was reviewed on the last guideline revised date: Computed Tomographic Angiography of the Chest, Heart and Coronary Arteries, (L33282) located at [fcso.com](http://fcso.com).

No National Coverage Determination (NCD) was found at the time of the last guideline reviewed date.

## DEFINITIONS:

No guideline specific definitions apply.

## RELATED GUIDELINES:

[Computed Tomography to Detect Coronary Artery Calcification, 04-70450-02](#)

[Computed Tomographic Angiography \(CTA\) Heart, 04-70540-03](#)

## OTHER:

Other names used to report computed tomography (CT Heart):

Cardiac Computed Tomography (CT)

Cardiac CT

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Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance. *Journal of the American College of Cardiology* 2011; 57 (9): 1126-1166.

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## **COMMITTEE APPROVAL:**

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 07/25/24.

## **GUIDELINE UPDATE INFORMATION:**

05/15/18	New Medical Coverage Guideline.
11/15/19	Revised position statements for (cardiac structure and function/adult congenital heart disease, left ventricular function assessment, valvular assessment, intra and extracardiac structures, electrophysiologic procedure planning, transcatheter structural intervention planning, aortic pathology). Revised description, reimbursement information and abbreviations. Updated references.
04/15/20	Review/revision. Revised and expanded criteria for: adult congenital heart disease, left ventricular function assessment, valvular heart disease, intra and extracardiac structures, transcatheter structural intervention planning, and aortic pathology. Expanded criteria for: electrophysiologic procedure planning.
01/01/22	Annual CPT/HCPCS coding update. Revised 75573 code descriptor.
05/15/22	Revised and expanded criteria for: congenital heart disease and aortic pathology. Added indication and criteria for cardiomyopathy. Revised criteria for: valvular heart disease and electrophysiologic procedure planning, and transcatheter structural intervention planning. Updated program exceptions, abbreviations, and references.
07/01/22	Revision to Program Exceptions section.
09/30/23	Review: position statement and references updated.
08/15/24	Review; no change in position statement. Updated references.