Evolent Clinical Guideline ~~025~~7296 for Heart Computed Tomography (CT)

Structure and Morphology, Congenital Studies

Guideline ~~or Policy~~ Number: Evolent_CG_~~025~~7296	**Applicable Codes**	
"Evolent" refers to Evolent Health LLC and Evolent Specialty Services, Inc. 		
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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Indications for determining medical necessity for non-contrast cardiac computed tomography.

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. (1–5)

INDICATIONS FOR HEART CT

Congenital Heart Disease ~~(1,2)~~(6,7)

For all indications below, either CT or cardiac magnetic resonance imaging (CMR) can be performed:

- All 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 patient with postprocedural aortic obstruction (**AUC Score 7**) [6]

Aortic Dilation

- Routine surveillance (6-12 months) in a child with aortic sinus and/or ascending aortic dilation with increasing size (**AUC Score 7**) [6]

Aortic Coarctation and Interrupted Aortic Arch

- Routine surveillance (3–5 years) in a child or adult with mild aortic coarctation (**AUC Score 7**) [6]
- Post procedure (surgical or catheter-based) routine surveillance (3–5 years) in an asymptomatic patient to evaluate for aortic arch aneurysms, in-stent stenosis, stent fracture, or endoleak (**AUC Score 8**) [6]

Tetralogy of Fallot

- Post procedure routine surveillance (2–3 years) in a patient with valvular or ventricular dysfunction, right ventricular outflow tract obstruction, branch pulmonary artery stenosis, arrhythmias, or presence of ~~an~~ a right ventricle (RV~~-~~) to~~-~~ pulmonary artery (PA) conduit (**AUC Score 7**) [6]

D-Loop Transposition of the Great Arteries

- Post procedure routine surveillance (3–5 years) in an asymptomatic patient (**AUC Score 7**) [6]
- Post procedure routine surveillance (1–2 years) in a patient with dilated neoaortic root with increasing size, or ~~aortic~~neoaortic regurgitation (**AUC Score 7**) [6]
- Post procedure routine surveillance (3–12 months) in a patient with ≥ moderate systemic AV valve regurgitation, systemic RV dysfunction, left ventricular outflow tract (LVOT) obstruction, or arrhythmias (**AUC Score 7**) [6]

Congenitally Corrected Transposition of the Great Arteries

- Unrepaired: routine surveillance (3–5 years) in an asymptomatic patient (**AUC Score 7**) [6]
- Postoperative: routine surveillance (3–5 years) in an asymptomatic patient (**AUC Score 7**) [6]
- Postoperative anatomic repair: routine surveillance (6–12 months) in a patient with valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, or presence of an RV-to-PA conduit (**AUC Score 7**) [6]
- Postoperative physiological repair with VSD closure and/or LV-to-PA conduit: routine surveillance (3–12 months) in a patient with ≥ moderate systemic AV valve regurgitation,

systemic RV dysfunction, and/or left ventricle (LV-) to -PA conduit dysfunction (**AUC Score 7**) [6]

Truncus Arteriosus

- Routine surveillance (1–2 years) in an asymptomatic child or adult with ≥ moderate truncal stenosis and/or regurgitation (**AUC Score 7**) [6]

Single-Ventricle Heart Disease ~~(~~

Includes hypoplastic left heart syndrome, double-inlet LV, double-inlet RV, mitral atresia, tricuspid atresia, unbalanced A-V septal defect~~): postoperative routine surveillance (3-5 years) in an asymptomatic patient (**AUC 7**)~~:

- Postoperative routine surveillance (3-5 years) in an asymptomatic patient (**AUC Score 7**) [6]

Cardiomyopathy ~~(3)~~(8)

- Quantification of myocardial (muscle) mass, when cardiovascular magnetic resonance (CMR) is contraindicated or ~~CT)~~ ~~(4,5,6)~~cannot be performed [9–11] (**AUC Score 7**) [8]
- Assessment of left ventricular systolic dysfunction when prior noninvasive imaging has been inadequate (**AUC Score 7**) [8]
- Assessment ~~of~~of right ventricular morphology in suspected arrhythmogenic right ventricular cardiomyopathy (**AUC ~~7)~~** ~~(7)~~ **Score 7**), [12] based upon other findings such as ~~(4)~~:(9):
  - ~~Nonsustained~~Non-sustained VT
  - Unexplained syncope
  - ECG abnormalities ~~(6)~~(11)
  - First-degree relative with positive genotype of ARVC (either, but CMR is superior to CT) ~~(4,6)~~(9,11)

Valvular Heart Disease ~~(8,9)~~(13,14)

- Characterization of native or prosthetic valves with clinical signs or symptoms suggesting valve dysfunction, when TTE, TEE, and/or fluoroscopy have been inadequate (**AUC Score 7**) [13]
- Evaluation of RV systolic function in severe TR, including systolic and diastolic volumes, when TTE images are inadequate and CMR is not readily available
- Pulmonary hypertension in the absence of severe valvular disease ~~(10)~~(15)
- Evaluation of suspected infective endocarditis with moderate to high pretest probability (i.e., staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device), when TTE and TEE have been inadequate
- Evaluation of suspected paravalvular infections when the anatomy cannot be clearly

delineated by TTE and TEE

Evaluation of Intra- and Extra-cardiac Structures ~~(3)~~(8)

- Evaluation of cardiac mass, suspected tumor or thrombus, or cardiac source of emboli, when imaging with TTE and TEE have been inadequate (**AUC Score 7**) (8)
- Re-evaluation of prior findings for interval change (i.e., reduction or resolution of atrial thrombus after anticoagulation ~~(AUC 8),~~) when a change in therapy is anticipated (**AUC Score 7**) ~~(3,11~~(8,16)
- Evaluation of pericardial anatomy (**AUC Score 8**), (8,12) when TTE and/or TEE are inadequate or for better tissue characterization of a mass and detection of metastasis [CMR superior for physiologic assessment (constrictive versus restrictive) and tissue characterization, CT superior for calcium assessment] ~~(4,12,13)~~(9,17,18)

Electrophysiologic Procedure Planning ~~(4,7)~~(9,12)

- Evaluation of pulmonary venous anatomy prior to radiofrequency ablation of atrial fibrillation and for follow-up when needed for evaluation of pulmonary vein stenosis (**AUC Score 8**) (12)
- Non-invasive coronary vein mapping prior to placement of biventricular pacing leads (**AUC Score 8**) (12)

Transcatheter Structural Intervention Planning

- Evaluation for transcatheter aortic valve replacement (TAVR) (**AUC Score 9**) ~~(8,14)~~(13,19)
- When TTE and 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 ~~(15)~~(20)
- Evaluation for suitability of transcatheter mitral valve procedures, alone or in addition to TEE ~~(16)~~(21)

Aortic Pathology ~~(3,~~(8,13,22–24)~~11,17,18)~~

- CT, MR, or echo can be used for screening and follow-up, with CT and MR preferred for imaging beyond the proximal ascending thoracic aorta in the following scenarios:
  - Evaluation of dilated aortic sinuses or ascending aorta identified by TTE (**AUC Score 8**) (8)
  - Suspected acute aortic pathology, such as dissection (**AUC Score 9**) (8)
  - Re-evaluation of known aortic dilation or aortic dissection with a change in clinical status or cardiac examination or when findings would alter management (**AUC Score 8**) (8)
  - Screening first-degree relatives of individuals with a history of thoracic aortic aneurysm or dissection, or an associated high-risk mutation for thoracic aneurysm in

common (**AUC Score 7**) [8]

- Screening second-degree relative of a patient with thoracic aortic aneurysm, when the first-degree relative has aortic dilation, aneurysm, or dissection
- Six-month follow-up after initial finding of a dilated thoracic aorta, for assessment of rate of change ~~(**AUC 8**)~~
- Annual follow-up of enlarged thoracic aorta with size up to 4.4 cm
- Biannual (twice/year) follow-up of enlarged aortic root ≥ 4.5 cm or showing growth rate ≥ 0.5 cm/year

- Patients with Marfan syndrome may undergo annual imaging with CT, MRI or TTE, with increase to biannual (twice-yearly) when diameter ≥ 4.5 cm or when expansions is > 0.5 cm/year (**AUC Score 8**) [8]
- Patient with Turner 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 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.

OTHER COMBINATION STUDIES WITH HEART CT

Chest MRA and Heart CT

- When medical necessity criteria indications are met for each Chest MRA (see Evolent Clinical Guideline ~~022-2~~2021 for Chest Magnetic Resonance Angiography (MRA)) and Heart MRI (see Evolent Clinical Guideline ~~028~~7297 for Heart Magnetic Resonance Imaging (MRI)) or Computed Tomography (CT ~~(such)~~ (such as for certain congenital malformations when evaluation of extra cardiac and cardiac structures are needed)

CODING AND STANDARDS

~~Coding~~

~~CPT~~ Codes

75572, 75573, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
~~☐~~☒	Medicare Advantage

BACKGROUND

General Overview

- Cardiac computed tomography (Heart CT) images the cardiac chambers, great vessels, valves, myocardium, and pericardium to assess cardiac structure and function, particularly when echocardiography (transthoracic echocardiography and transesophageal echocardiography) cannot provide adequate information
- CT imaging can be used for assessment of:
  - Structures of the heart (e.g., chambers, valves, great vessels, masses), as in this guideline
  - Quantitative level of calcium in the walls of the coronary arteries, in the separate coronary artery calcium (CAC) scoring guideline

AUC Score

A reasonable diagnostic or therapeutic procedure care can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. (2)

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Acronyms / Abbreviations

ARVD/C: Arrhythmogenic right ventricular dysplasia/cardiomyopathy

CABG: Coronary artery bypass grafting surgery

CAD: Coronary artery disease

CCS: Coronary calcium score

CCT: Cardiac (Heart) CT

CHD: Coronary heart disease

CMR: Cardiac magnetic resonance (imaging)

CT: Computed tomography

CTA: Computed tomography angiography

ECG: Electrocardiogram

EF: Ejection fraction

HF: Heart failure

LVOT: Left ventricular outflow tract

MI: Myocardial infarction

MPI: Myocardial perfusion Imaging or cardiac nuclear imaging

MR(I): Magnetic resonance (imaging)

PA: Pulmonary artery

PCI: Percutaneous coronary intervention

PVML: Paravalvular mitral leak

RV: Right ventricle

SE: Stress echocardiogram

TAVR: Transcatheter aortic valve replacement

TMVR: Transcatheter mitral valve replacement

TR: Tricuspid regurgitation

TEE: Transesophageal echocardiography

TTE: Transthoracic echocardiography

VT: Ventricular tachycardia

SUMMARY OF EVIDENCE

ACC/AHA/ASE/HRS/ISACHD/SCAI/SCCT/SCMR/SOPE 2020 Appropriate Use Criteria for Multimodality Imaging During the Follow-Up Care of Patients With Congenital Heart Disease [6]

Study Design: The study was conducted by the American College of Cardiology Solution Set Oversight Committee and Appropriate Use Criteria Task Force, along with several other cardiovascular societies. It involved the development of appropriate use criteria (AUC) for multimodality imaging during the follow-up care of patients with congenital heart disease (CHD).

The criteria were developed using guidelines, clinical trial data, and expert opinion in the field of CHD. The writing group developed 324 clinical indications, which were separated into 19 tables according to the type of cardiac lesion. These scenarios were presented to an independent panel for rating, with each being scored on a scale of 1 to 9, with 1 to 3 categorized as "Rarely Appropriate," 4 to 6 as "May Be Appropriate," and 7 to 9 as "Appropriate".

Target Population: The target population includes both pediatric and adult patients with established congenital heart disease. The criteria address cardiac imaging in adult and pediatric patients with established CHD, focusing on evaluation before and after cardiac surgery or catheter-based intervention, routine surveillance, and evaluation of new-onset signs or symptoms.

Key Factors:

Indications: The study developed 324 clinical indications related to the follow-up care of patients with CHD. These indications were categorized into 19 tables based on the type of cardiac lesion.

Imaging Modalities: The study evaluated the use of various noninvasive cardiac imaging modalities, including transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), cardiovascular magnetic resonance (CMR), cardiovascular computed tomography (CCT), stress imaging, and lung scan.

Rating System: Each clinical scenario was rated on a scale of 1 to 9, with 1 to 3 categorized as "Rarely Appropriate," 4 to 6 as "May Be Appropriate," and 7 to 9 as "Appropriate." The ratings were based on clinical practice guidelines, expert opinion, and available evidence.

Outcomes: The study aimed to provide guidance to clinicians in the care of patients with established CHD by identifying reasonable imaging modality options for evaluation and surveillance. It also aimed to serve as an educational and quality improvement tool to identify patterns of care and reduce the number of rarely appropriate tests in clinical practice.

2018 AHA/ACC Guideline for the Management of Adults With Congenital Heart Disease [7]

Study Design The study involved the development of the 2018 AHA/ACC Guideline for the Management of Adults with Congenital Heart Disease (ACHD). The guidelines were developed by the American College of Cardiology (ACC) and the American Heart Association (AHA) Task Force on Clinical Practice Guidelines. The process included a comprehensive review of published evidence, diagnostic and therapeutic procedures, and assessment of the risk-benefit ratio. The guidelines were developed by a task force of selected experts in the field, representing various ACC sub-specialty groups.

Target Population: The guidelines focus on adults with congenital heart disease (ACHD), including those with simple, moderate, and complex congenital heart defects. The target population encompasses a wide range of congenital heart conditions, such as atrial septal defect (ASD), ventricular septal defect (VSD), atrioventricular septal defect (AVSD), patent ductus arteriosus (PDA), left ventricular outflow tract obstruction (LVOTO), coarctation of the aorta (CoA), and aortopathies.

Key Factors:

Recommendations: The guidelines provide evidence-based recommendations for the diagnosis, management, and treatment of ACHD, including surgical and catheter interventions, medical therapy, and follow-up care.

Diagnostic Testing: The guidelines emphasize the importance of accurate diagnosis, risk assessment, and selection of the most suitable type of intervention. Diagnostic testing includes echocardiography, cardiovascular magnetic resonance imaging (CMR), cardiovascular computed tomography (CCT), and cardiac catheterization.

Medical Therapy: The guidelines recommend medical therapy for heart failure, arrhythmias, pulmonary hypertension, and other related conditions. Specific therapies include beta blockers, angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), and pulmonary vasodilators.

Surgical and Catheter Interventions: The guidelines provide detailed recommendations for surgical and catheter interventions for various congenital heart defects, including ASD, VSD, AVSD, PDA, LVOTO, CoA, and aortopathies.

Follow-up Care: The guidelines emphasize the importance of lifelong follow-up care for ACHD patients, including regular imaging, exercise testing, and monitoring for complications.

ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2019 Appropriate Use Criteria for Multimodality Imaging in the Assessment of Cardiac Structure and Function in Nonvalvular Heart Disease [8]

Study Design: The study is a report developed by the American College of Cardiology Appropriate Use Criteria Task Force, along with several other cardiovascular societies. It aims to provide appropriate use criteria (AUC) for multimodality imaging in nonvalvular heart disease. The clinical scenarios (indications) were developed by a diverse writing group and scored by an independent rating panel using standardized methodology.

Target Population: The target population includes patients with nonvalvular heart disease, encompassing various conditions such as heart failure, diseases of the aorta and pericardium, and any disorder involving abnormal cardiac structure or function excluding valvular diseases.

Key Factors:

Clinical Scenarios: The document covers 102 clinical scenarios representing patient presentations encountered in everyday practice. These scenarios were developed based on the most current American College of Cardiology/American Heart Association Clinical Practice Guidelines.

Imaging Modalities: The study evaluates multiple imaging modalities, including transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), cardiovascular magnetic resonance imaging (CMR), computed tomography (CT), and others.

Appropriateness Ratings: Each clinical scenario was rated on a scale of 1 to 9, with scores of 7 to 9 indicating that a modality is considered appropriate, scores of 4 to 6 indicating that a modality may be appropriate, and scores of 1 to 3 indicating that a modality is considered rarely appropriate.

Objective: The primary objective is to provide a framework for the assessment of these scenarios by practices that will improve and standardize physician decision-making.

ANALYSIS OF EVIDENCE

Shared Conclusions [6–8]

1. **Importance of Multimodality Imaging**: All three articles emphasize the significance of using multiple imaging modalities to assess and manage heart disease. They highlight the strengths and limitations of different imaging techniques and recommend their use based on specific clinical scenarios.
2. **Individualized Care Plans**: The articles stress the need for personalized care plans tailored to the patient's specific condition and clinical status. This approach ensures that patients receive the most appropriate and effective care.
3. **Collaboration Among Healthcare Providers**: The importance of collaboration between cardiologists, surgeons, and other healthcare providers is a common theme. This multidisciplinary approach is crucial for optimizing patient outcomes and managing complex cases.

POLICY HISTORY

~~Summary~~

Date	Summary
July 2025	● This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7296-01 for Heart CT and ECG 025 for Heart CT into Evolent Clinical Guideline 7296 for Heart Computed Tomography (CT) ○ Added a subtitle – Structure and Morphology, Congenital Studies ○ This guideline also merges Procedure Codes from these two Evolent guidelines ● Added new bullet-point to the General Statement section ● Checked the Medicare Advantage box in the Applicable Lines of Business table ● Added AUC Score section to the Background ● Added a Summary of Evidence and Analysis of Evidence ● Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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