CIGNA MEDICAL COVERAGE POLICIES- RADIOLOGY

Pediatric Cardiac Imaging Guidelines

Effective Date: February 02, 2027

Instructions for use

The following coverage policy applies to health benefit plans administered by Cigna. Coverage policies are intended to provide guidance in interpreting certain standard Cigna benefit plans and are used by medical directors and other health care professionals in making medical necessity and other coverage determinations. Please note the terms of a customer's particular benefit plan document may differ significantly from the standard benefit plans upon which these coverage policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a coverage policy.

In the event of a conflict, a customer's benefit plan document always supersedes the information in the coverage policy. In the absence of federal or state coverage mandates, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of:

1. The terms of the applicable benefit plan document in effect on the date of service
2. Any applicable laws and regulations
3. Any relevant collateral source materials including coverage policies
4. The specific facts of the particular situation

Coverage policies relate exclusively to the administration of health benefit plans. Coverage policies are not recommendations for treatment and should never be used as treatment guidelines.

This evidence-based medical coverage policy has been developed by EviCore, Inc. Some information in this coverage policy may not apply to all benefit plans administered by Cigna.

These guidelines include procedures EviCore does not review for Cigna. Please refer to the **Cigna CPT code list** for the current list of high-tech imaging procedures that EviCore reviews for Cigna.

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General Information

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Pediatric Cardiac Imaging Guidelines

General Guidelines (PEDCD-1.0)

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Criteria

Heart disease in the pediatric population involves predominantly congenital lesions. Pediatric individuals can have acquired heart disease unique to children. For those diseases which occur in both pediatric and adult populations, differences exist in management due to individual age, comorbidities, and differences in disease natural history between children and adults.

Pediatric Cardiac Imaging Appropriate Clinical Evaluation

- Prior to considering advanced imaging (CT, MR, Nuclear Medicine) or echocardiogram, a pertinent clinical evaluation should be performed, including **both** of the following:
  - A detailed history, physical examination, or meaningful technological contact (telehealth visit, telephone call, electronic mail or messaging)
  - A review of appropriate diagnostic studies (laboratory, EKG, echocardiogram, and other diagnostic imaging)
- A recent clinical evaluation is not needed prior to advanced imaging (CT, MR, Nuclear Medicine) or echocardiogram if **any** of the following apply:
  - Individual is undergoing guideline-supported scheduled imaging evaluation.
  - Echocardiogram is being performed at the first cardiology visit for an appropriate indication as stated in these guidelines.
  - Routine imaging is anticipated at the next visit (e.g., one year follow-up echocardiogram for a 10 year old with a VSD).
- Advanced imaging of the heart and echocardiogram are considered medically necessary in any of the following:
  - Individuals who have documented active clinical signs or symptoms of disease involving the heart
  - As follow-up for findings on echocardiograms
- Repeat imaging studies of the heart are considered medically necessary when any of the following applies:
  - Repeat imaging is considered medically necessary in a specific guideline section.
  - There is evidence for progression of disease on imaging.
  - There is documentation describing how repeat imaging will affect treatment decisions for a new onset disease.

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- Asymptomatic individuals with exposure to cardiotoxic drugs can have serial echocardiograms as per **Cardiotoxicity and Echocardiography (PEDONC-19.2)** in the Pediatric Oncology Imaging Guideline.
- Advanced imaging and echocardiogram is considered **not** medically necessary, in the absence of other appropriate indications listed in these guidelines, for **any** of the following:
  - Individuals starting ADHD medications
  - To screen asymptomatic individuals for disorders involving the heart

Pediatric Cardiac Imaging Modality General Considerations

There are a number of variables that influence the modality and timing of imaging individuals with congenital heart disease, including gestational age, chronological age, physiologic effects of the defect, status of interventions (catheterization and surgical), rate of individual's growth, stability of the defect on serial imaging, comorbid conditions, and activity level, which results in a high degree of individuality in determining the schedule for imaging these individuals.

- MRI
  - MRI and MRA studies are frequently considered medically necessary for evaluation of congenital heart defects not well visualized on echocardiography, thoracic arteries and veins not visualized on echocardiography, cardiomyopathies, and right ventricular disease, as well as in follow-up for these indications.
  - Due to duration of MRI acquisition and the need to minimize individual movement, anesthesia is typically required for most infants (excluding neonates), young children (age <7 years), and older children with delays in development or maturity.
  - MRI protocols in this population should aim to minimize anesthesia exposure. When intravenous access is already established for anesthesia and there are no contraindications to contrast, performing MRI both without and with contrast is considered medically necessary to avoid repeat imaging and additional anesthesia if the non-contrast study is inconclusive. The use of gadolinium-based contrast agents should be carefully considered given evidence of deposition in the brain and other tissues.
- CT
  - CT is primarily used to evaluate the coronary and great vessels in congenital heart disease if cardiac MR is contraindicated. Studies may be limited to the region of interest, particularly for follow-up, to reduce radiation exposure.
  - Contrast use in the pediatric population should follow clinical indication. CT may be appropriate for further evaluation of findings on prior imaging or as specified in condition-based guidelines, but should not replace MRI solely to avoid sedation unless recommended. Coordination between the provider and imaging service may be necessary to determine the optimal study.

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- Ultrasound
  - Echocardiography is the primary modality used to evaluate the anatomy and function of the pediatric heart and is generally indicated before considering other imaging modalities.
- Nuclear Medicine
  - Multi Gated Acquisition (MUGA) studies (CPT® 78472, CPT® 78473, CPT® 78481, CPT® 78483, CPT® 78494, or CPT® 78496) are rarely performed in pediatrics but are considered medically necessary for the following:
    - In pediatric oncology when echocardiography is inconclusive or suboptimal (see: **Appropriate Clinical Evaluations (PEDONC-1.2)** for imaging guidelines)
    - Quantitation of left ventricular function when recent echocardiogram shows ejection fraction of <50% and MUGA results will impact acute patient care decisions
  - SPECT/CT fusion imaging involves SPECT (MPI) imaging and CT for optimizing location, accuracy, and attenuation correction combines functional and anatomic information.
    - There is currently no evidence-based data to formulate appropriateness criteria for SPECT/CT fusion imaging.
    - Combined use of nuclear imaging, including SPECT, along with diagnostic CT (fused SPECT/CT) is considered investigational.
  - Procedures reported with CPT® 78414 and CPT® 78428 are essentially obsolete but are considered medically necessary when other preferred modalities are unavailable or non-diagnostic. Left ventricular ejection fraction can be obtained by echocardiogram, SPECT MPI, MUGA study, cardiac MRI, cardiac CT, or cardiac PET depending on the clinical situation, rather than by the non-imaging heart function study described by CPT® 78414.
  - Cardiac Shunt Detection (CPT® 78428) is rarely performed in pediatrics but is considered medically necessary for individuals in whom CMR is not diagnostic.
    - Calculation of left and right ventricular ejection fractions
    - Assessment of wall motion
    - Quantitation of right to left shunts
  - 99mTc-PYP Myocardial Imaging
    - See **Myocardial 99mTc-PYP Pyrophosphate Imaging in Cardiac Amyloidosis (CD-3.8)** in the General Cardiac Imaging Guidelines for identification of myocardial ATTR (transthyretin) amyloidosis.

Pediatric Age

For the purposes of these guidelines, pediatric age groups are defined as follows:

- **Neonate (Newborn)**: Birth through 28 days of age
- **Infant**: Birth through 12 months of age

- **Pre-adolescent Child**: 1 year through 10 years of age
- **Adolescent**: 11 years through less than 19 years of age
- **Child**: 1 year through less than 19 years of age

Glossary

Acute Chest pain	Chest pain is new onset (<2 mo) or involves a change in pattern, intensity, or duration compared with previous episodes in an individual with recurrent symptoms
Acute Coronary Syndrome (ACS)	ACS (unstable angina, STEMI and NSTEMI) - sudden imbalance between myocardial oxygen consumption and demand, usually related to coronary artery obstruction, but includes other non-coronary artery origins such as acute coronary insufficiency (e.g., coronary embolism), hypotension, non-ischemic myocardial injury (e.g., myocarditis) and multifactorial causes that are not mutually exclusive (e.g., stress cardiomyopathy)
Adverse Pregnancy Outcomes (APO)	Adverse pregnancy outcomes (APOs) include myriad maternal or fetal complications, including hypertensive disorders of pregnancy (gestational hypertension, preeclampsia, eclampsia, and HELLP [hemolysis, elevated liver enzymes, low platelets] syndrome), placental abruption, spontaneous preterm birth, fetal growth restriction, and small-for-gestational-age infant
Agatston Score	A nationally recognized calcium score for the coronary arteries based on Hounsfield units and size (area) of the coronary calcium
Angina pectoris	Retrosternal chest discomfort that builds gradually in intensity (over several minutes), is usually precipitated by stress (physical or emotional) or occurring at rest (as in the case of an ACS) with characteristic radiation (e.g., left arm, neck, jaw) and its associated symptoms (e.g., dyspnea, nausea, lightheadedness). When actively treated (e.g., nitroglycerin) or spontaneously resolving (e.g., with rest), it dissipates over a few minutes

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Anginal variants or equivalents	Symptoms or pain at a site other than the chest occurring in an individual at high cardiac risk (i.e., known CAD, diabetes). Anginal equivalents have the same importance as angina pectoris and can present as dyspnea, diaphoresis, nausea, extreme fatigue, pain, pressure, tightness, or discomfort in shoulders, arms, neck, back, upper abdomen, or jaw not otherwise explained by another process.
ARVD/ARVC – Arrhythmogenic Right Ventricular Dysplasia/ Cardiomyopathy	A potentially lethal inherited disease with syncope and rhythm disturbances, including sudden death, as presenting manifestations
BNP	B-type natriuretic peptide, blood test used to diagnose and track heart failure (n-T-pro-BNP is a variant of this test)
Brugada Syndrome	An electrocardiographic pattern that is unique and might be a marker for significant life-threatening dysrhythmias
Chronic Coronary Syndrome	CAD that is chronic, often progressive, and is treatable with lifestyle adjustments, medications, and invasive interventions instituted to achieve disease stabilization or regression
Double Product (Rate Pressure Product)	An index of cardiac oxygen consumption, is the systolic blood pressure times heart rate, generally calculated at peak exercise; over 25000 means an adequate stress load was performed
Fabry Disease	An infiltrative cardiomyopathy, can cause heart failure and arrhythmias
Fatigue	A subjective feeling of weakness, tiredness or exhaustion. Exertional fatigue is acute in nature, with rapid onset, short duration, and short recovery period.
First-degree relative	A biological parent, sibling, or child of an individual
Hibernating myocardium	Viable but poorly functioning or non-functioning myocardium which likely could benefit from intervention to improve myocardial blood supply

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Major epicardial coronary arteries	The large, angiographically visible coronary arteries supplying the myocardium, including the left main, LAD, LCx, RCA, and clinically significant branch vessels >1.5 mm in diameter
NSTEMI (Non-ST Segment Myocardial Infarction)	Troponin rise/fall with ≥1 value >99th percentile without STEMI ECG criteria,
Optimized Medical Therapy	Should include (where tolerated) antiplatelet agents, calcium channel antagonists, partial fatty acid oxidase inhibitors (e.g., ranolazine), statins, short-acting nitrates as needed, long-acting nitrates up to 6 months after an acute coronary syndrome episode, beta blocker drugs (optional), angiotensin-converting enzyme (ACE) inhibitors/angiotensin receptor blocking (ARB) agents (optional)
Platypnea	Shortness of breath when upright or seated (the opposite of orthopnea) and can indicate cardiac malformations, shunt or tumor
Risk factors for Cardiac Chest pain	Comorbidities that increase the risk of developing coronary artery disease such as age ≥65 y, diabetes, hypertension (i.e., stage 1 hypertension (130–139mm Hg systolic or 80–89mm Hg diastolic), or stage 2 hypertension (≥140mm Hg systolic or ≥90mm Hg diastolic), adverse pregnancy outcomes, family history of premature CAD (history of any direct blood relatives [parents, siblings, children]) who have had any of the following conditions at age 55 or younger for male relatives or age 65 or younger for female relatives: AMI, sudden cardiac death without obvious cause, CABG surgery, PCI, familial/genetic factors (includes genetic abnormalities leading to vasculopathies, aneurysmal disorders, cardiomyopathies, coagulopathies, and inherited dysrhythmia syndromes)
Silent ischemia	Absence of ischemic symptoms or signs prior to objective demonstration of ischemia by stress testing and/or demonstration of obstructive CAD

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Stable Chest Pain	Chest pain symptoms are chronic (≥2 mo) and associated with consistent precipitants such as exertion or emotional stress
STEMI (ST Segment Myocardial Infarction)	STEMI (ST Segment Myocardial Infarction): ECG: persistent ST-elevation meeting J-point criteria + troponin rise/fall above 99th percentile
Syncope	Loss of consciousness; near-syncope is not syncope
Takotsubo cardiomyopathy	Apical dyskinesis oftentimes associated with extreme stress and usually thought to be reversible
Troponin	A marker for ischemic injury, primarily cardiac
TAVR (TAVI)	A minimally invasive procedure to treat aortic valve disease
Unstable Angina	Ischemic symptoms at rest or with decreasing threshold, present <2 weeks, without STEMI ECG criteria and without troponin elevation.

Abbreviations used in the Cardiac Imaging Guidelines

Abbreviation	Description
ACC	American College of Cardiology
ACS	Acute coronary syndrome
AHA	American Heart Association
AMI	Acute myocardial infarction
ANOCA	Angina with no obstructive coronary artery disease
ASCOT	Anglo-Scandinavian Cardiac Outcomes Trial
ASD	Atrial septal defect
AVR	Aortic valve replacement
BMI	Body mass index

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Abbreviation	Description
BiVAD	Biventricular assist device
CABG	Coronary artery bypass grafting
CAC	Coronary artery calcium
CAD	Coronary artery disease
CAD-RADS 2	The Coronary Artery Disease Reporting and Data System
CHF	Congestive heart failure
CIED	Cardiac implantable electronic device
CMD	Coronary microvascular dysfunction
CMR	Cardiovascular magnetic resonance
COPD	Chronic obstructive pulmonary disease
CT	Computed tomography
CCTA	Coronary computed tomography angiography
CCT	Cardiac computed tomography
CTA	Computed tomography angiography
CTEPH	Chronic thromboembolic pulmonary hypertension
CTRCD	Cardiotoxic Agent/Cancer Therapeutics-Related Cardiac Dysfunction
CTV	Computed tomography venography
CV	Cardiovascular
EBCT	Electron beam computed tomography
ECP	External counterpulsation (also known as EECP)
ECG	Electrocardiogram

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Abbreviation	Description
ECP	External counterpulsation
ETT	Exercise treadmill stress test
FDG	Fluorodeoxyglucose, a radiopharmaceutical used to measure myocardial metabolism
FFR	Fractional flow reserve
HCM	Hypertrophic cardiomyopathy
HF	Heart failure
INOCA	Ischemia with no obstructive coronary artery disease
IV	Intravenous
LAD	Left anterior descending coronary artery
LCx	Left circumflex artery
LDL-C	Low density lipoprotein cholesterol
LHC	Left heart catheterization
LM	Left main coronary artery
LV	Left ventricle
LVAD	Left ventricular assist device
LVEF	Left ventricular ejection fraction
LVOT	Left ventricular outflow tract
MI	Myocardial infarction
MINOCA	Myocardial infarction with no obstructive coronary artery disease
MPI	Myocardial perfusion imaging (SPECT study, nuclear cardiac study)
MRA	Magnetic resonance angiography

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Abbreviation	Description
MRI	Magnetic resonance imaging
mSv	millisievert (a unit of radiation exposure) equal to an effective dose of a joule of energy per kilogram of recipient mass
MUGA	Multi gated acquisition scan of the cardiac blood pool
PCI	Percutaneous coronary intervention (includes percutaneous coronary angioplasty (PTCA) and coronary artery stenting)
PET	Positron emission tomography
PET MPI	PET myocardial perfusion imaging
PTCA	Percutaneous coronary angioplasty
RCA	Right coronary artery
RHC	Right heart catheterization
RVAD	Right ventricular assist device
SCAD	Spontaneous coronary artery dissection
SPECT	Single photon emission computed tomography
SPECT MPI	SPECT myocardial perfusion imaging
Stress-perfusion CMR	Stress-perfusion cardiovascular magnetic resonance (CMR)
Stress Echo	Stress echocardiography
TEE	Transesophageal echocardiogram
TAVI	Transcatheter aortic valve implantation
TAVR	Transcatheter aortic valve replacement
TIA	Transient Ischemic Attack
TTE	Transthoracic echocardiogram
VSD	Ventricular septal defect

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Background and Supporting Information

Individuals who are under 19 years of age should be imaged according to the Pediatric Cardiac Imaging Guidelines and the general Cardiac Imaging Guidelines. Individuals who are 19 years of age or older should be imaged according to the Cardiac Imaging Guidelines, except where directed otherwise by a specific guideline section. Adult individuals who also have congenital heart disease should be imaged by **Adult Congenital Heart Disease** in the general Cardiac Imaging Guidelines.

The guidelines listed in this section for certain specific indications are not intended to be all-inclusive; clinical judgment remains paramount, and variance from these guidelines may be appropriate and warranted for specific clinical situations.

Health Equity Considerations

Health equity is the highest level of health for all individuals; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which individuals are born, grow, live, work, and age. Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include the following: safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

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Congenital Heart Disease

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Congenital Heart Disease General (PEDCD-2.1)

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Criteria

- MRA or CTA Chest is considered medically necessary when prior echocardiogram is equivocal or suboptimal regarding the aortic arch, pulmonary arteries or veins, or other thoracic issue.
- When both Cardiac MRI or CT Cardiac and MRA Chest or CTA Chest is considered medically necessary this is abbreviated as CMR/CCT/CCTA **and/or** MRA/CTA Chest in this guideline.
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest is considered medically necessary in place of a TTE when future echocardiograms are expected to be non-diagnostic or inconclusive due to a persistent anatomic or physiologic condition.

Age Definitions

For the purposes of these guidelines, pediatric age groups are defined as follows:

- **Neonate (Newborn)**: Birth through 28 days of age
- **Infant**: Birth through 12 months of age
- **Pre-adolescent Child**: 1 year through 10 years of age
- **Adolescent**: 11 years through less than 19 years of age
- **Child**: 1 year through less than 19 years of age

Pediatric or Children refers to all individuals from birth through less than 19 years of age.

Imaging considerations

- Newborns (neonates) the following special considerations are considered medically necessary.
  - TTE at any frequency when there are concerns for a ductal dependent lesion
  - TTE at any frequency when changes in pulmonary vascular resistance are suspected or known
  - One repeat TTE when a prior TTE is abnormal or equivocal (either in the hospital or as newborn outpatient)
- TTE is considered medically necessary in individuals with congenital heart disease when there is a **change in clinical status or new concerning signs or symptoms** including:
  - Shortness of breath

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- Fatigue
- Chest discomfort
- Percentile weight loss
- Weight gain
- Poor feeding
- Tachypnea
- Tachycardia
- CHF signs on exam
- Change in EKG, Pulse ox, or laboratory values

- An additional TTE is considered medically necessary prior to the next routine interval study to assess for more rapid change when a change is identified on a surveillance TTE such as:
  - Increasing stenosis gradient
  - Increasing regurgitation amount
  - Increasing pulmonary vascular resistance
  - Decreased ventricular function
  - Change in ductal status
- Imaging with medication adjustments may require additional imaging at that time.
  - TTE is considered medically necessary when making dose adjustments (changing to the equivalent mcg/kg or mg/kg is not considered a dosing change for imaging).
  - More than one TTE is considered medically necessary to determine dose response in infants due to rapid growth in this age group, changing physiology, pulmonary vascular resistance, ductal size, and weight changes.
- Medically necessary imaging in heart surgery
  - TTE is considered medically necessary one month prior to heart surgery. Depending on lesion, MR/CT Cardiac and/or Chest may also be included.
  - TTE within one month post-operative
  - CMR or CCT if prior TTE is equivocal or suboptimal
- Individuals with pulmonary hypertension (PH) and congenital heart disease (CHD) are evaluated for both their congenital lesion and for PH.

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Congenital Heart Disease Coding and Modality Considerations (PEDCD-2.2)

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Criteria

Congenital Heart Disease imaging per modality (PEDCD-2.2.2)

Congenital Heart Disease Echocardiography Coding

- The following are common echocardiography code combinations used for re-evaluation of individuals with known congenital heart disease:
  - CPT® 93303, CPT® 93320, and CPT® 93325
  - CPT® 93304, CPT® 93321, and CPT® 93325
  - CPT® 93303
  - CPT® 93304
- CPT® 93306 is considered not medically necessary in the evaluation of known congenital heart disease.

Echocardiogram

Echocardiography is the primary imaging modality used for diagnosing and monitoring congenital heart disease and is generally required before other imaging modalities are considered unless otherwise stated in a specific guideline section.

- Transthoracic echocardiogram (TTE)
  - TTE for congenital cardiac anomalies; complete (CPT® 93303)
  - TTE for congenital cardiac anomalies; limited study (CPT® 93304)
  - TTE (2D) m-mode recording, complete, with spectral and color flow doppler echocardiography (CPT® 93306)
  - TTE (2D) with or without m-mode recording; complete (CPT® 93307)
  - TTE (2D) with or without m-mode recording; limited study (CPT® 93308)
- Transesophageal echocardiogram (TEE)
  - TEE (2D) including probe placement, imaging, interpretation, and report (CPT® 93312)
  - TEE for congenital cardiac anomalies; including probe placement, imaging, interpretation, and report (CPT® 93315)

MRI

CMR either without contrast or without and with contrast is considered medically necessary when a recent TTE is inconclusive, needs confirmation of findings, or

does not completely define the disease (for subsequent follow-up studies, a recent echocardiogram is not a requirement).

MRI Cardiac (CMR) for velocity flow mapping is considered medically necessary when TTE is equivocal or suboptimal regarding valvular disease or when intracardiac blood flow studies are needed.

MRA Chest is considered medically necessary if TTE is equivocal or suboptimal when the aorta or pulmonary artery needs to be visualized beyond the root or if aortopulmonary collaterals, pulmonary veins, or systemic veins need to be visualized.

MRA Chest alone is considered medically necessary if the individual cannot cooperate with full cardiac MRI exam.

MRA Chest is considered medically necessary for assessment of the great arteries, pulmonary veins, and systemic chest veins when recent TTE is equivocal or suboptimal including the following issues:

- Coarctation of the aorta
- Tetralogy of Fallot
- Anomalous pulmonary veins
- Transposition of the great arteries
- Truncus arteriosus
- Vascular rings and other lesions of the great arteries
- MRI Cardiac (CMR)
  - MRI Cardiac for morphology and function without contrast (CPT® 75557)
  - MRI Cardiac for morphology and function without and with contrast (CPT® 75561)
  - MRI Cardiac for velocity flow mapping (List separately in addition to code for primary procedure) (CPT® 75565)
- MRI Chest
  - MRI Chest without contrast (CPT® 71550)
  - MRI Chest with contrast (CPT® 71551)
  - MRI Chest with & without contrast (CPT® 71552)
- MRI Angiography (MRA)
  - MRA Chest (excluding myocardium) with or without contrast (CPT® 71555)

CT

CT Chest is considered medically necessary when TTE is equivocal or suboptimal regarding determination of vascular extra-cardiac anatomy in individuals with complex congenital heart disease or pulmonary artery (PA) and pulmonary vein (PV) assessment.

CTA Chest is considered medically necessary when TTE is equivocal or suboptimal regarding coarctation of the aorta, Tetralogy of Fallot, anomalous pulmonary veins and other lesions of the great arteries, and vascular rings.

CTA Cardiac (CCTA) is considered medically necessary when TTE is equivocal or suboptimal regarding coronary artery anomalies.

CT cardiac is considered medically necessary when TTE is equivocal or suboptimal regarding coronary structure and morphology.

- Cardiac (CCT)
  - CT, Heart, with contrast material, for evaluation of cardiac structure and morphology (CPT® 75572)
  - CT, Heart, with contrast material, for evaluation of cardiac structure and morphology in the setting of congenital heart disease (CPT® 75573)
- CT Angiography-Cardiac (CCTA)
  - CTA Heart, coronary arteries and bypass grafts (when present), with contrast, including 3D image post processing (CPT® 75574)
- CT-Chest
  - CT Thorax without contrast (CPT® 71250)
  - CT Thorax with contrast (CPT® 71260)
  - CT Thorax without & with contrast (CPT® 71270)
- CT Angiography Chest (CTA Chest)
  - CTA Chest without and with contrast (CPT® 71275)

Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI)

- Stress echo
  - Echocardiography (TTE), (2D), with or without m-mode, during rest and cardiovascular stress, with interpretation and report (CPT® 93350)
  - Echocardiography (TTE), (2D), m-mode, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation (CPT® 93351)
- Stress -perfusion CMR
  - Cardiac MRI for morphology and function without contrast, with stress imaging (CPT® 75559)
  - Cardiac MRI for morphology and function without and with contrast, with stress imaging (CPT® 75563)
- Myocardial perfusion imaging (MPI)
  - SPECT MPI CPT® 78451, 78452

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- PET MPI CPT® 78491, 78492, 78430, 78431, 78432, 78433

Pulmonary perfusion imaging

Pulmonary perfusion imaging is considered medically necessary in individuals with congenital heart disease or suspected congenital heart diseases when there are clinical questions regarding relative pulmonary blood flow,

- Pulmonary perfusion imaging (e.g., particulate) (CPT® 78580)
- Pulmonary ventilation (e.g., aerosol or gas) and perfusion imaging (CPT® 78582)

Cardiac Catheterization Procedure Codes

Codes	Cardiac Catheterization Procedures
93451-93464 93566-93568	Anomalous coronary arteries, patent foramen ovale, mitral valve prolapse, and bicuspid aortic valve
RHC without LHC or coronaries	
93451	Right Heart Catheterization Including Measurement(S) Of Oxygen Saturation And Cardiac Output, When Performed
LHC without RHC or coronaries	
93452	Left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
RHC and retrograde LHC without coronaries	
93453	Combined right and left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
Native coronary artery catheterization	
93454	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation
with bypass grafts	

Codes	Cardiac Catheterization Procedures
93455	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial venous grafts) including intraprocedural injection(s) for bypass graft angiography
with RHC	
93456	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right heart catheterization
with RHC and bypass grafts	
93457	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography and right heart catheterization
with LHC	
93458	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed
with LHC and bypass grafts	
93459	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography
with RHC and LHC	

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Codes	Cardiac Catheterization Procedures
93460	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed
with RHC and LHC and bypass grafts	
93461	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography
93593-93597	**Congenital Heart Disease Code "Set"**
CPT® 93593 to 93597 are appropriate for invasive evaluation of congenital heart disease	
93593	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; normal native connections
93594	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; abnormal native connections
93595	Left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone, normal or abnormal native connections
93596	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); normal native connections
93597	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); abnormal native connections

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Imaging and Surveillance per Congenital Lesion (PEDCD-2.4)

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- Echocardiography is often repeated frequently throughout a pediatric individual's life and are generally considered medically necessary regardless of symptoms based on the lesion and age of the individual.
  - Modifiers following guidelines
    - Some congenital conditions may require more frequent testing, especially with more complex heart disease, congestive heart failure, obstructive heart lesions, ductal dependent lesions, changes in clinical status, repeat interventions, and/or in neonates.
    - Any individual being treated for heart failure, with consideration for changing medical regimen can have an echocardiogram.
- Echocardiography is performed during the physician office visit, and these studies should not be denied because of lack of recent contact.

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Atrial Defects: Secundum ASD, PFO, and Partial Anomalous Pulmonary Venous Return (PAPVR), Sinus Venosus Defect (PEDCD-2.4.1)

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Criteria

For imaging in AVSD, see **AVSD (Atrioventricular canal, endocardial cushion defect) (PEDCD-2.4.3)**.

PFO (Patent Foramen Ovale)

- Routine surveillance in an asymptomatic individual with PFO is considered not medically necessary.
  - PFO is a normal variant.
  - In infants, a PFO that is difficult to distinguish from an ASD can be imaged with the same guidelines as used in a small unrepaired ASD (with congenital echo).
- Follow-up imaging with an echocardiogram is considered medically necessary when there is documentation of the following:
  - New cardiac symptoms
  - A concern that the last echocardiogram was equivocal for other cardiac issues
  - Question of a clot/embolism that has gone across the PFO
  - Prior echocardiogram did not differentiate the PFO from a secundum ASD.
- TTE (CPT® 93306- non congenital echocardiogram) is considered medically necessary when an individual with a prior history of PFO requires an echocardiogram for any new reason.
- Preoperative for PFO closure
  - TTE or TEE
    - Closure is rare in children, TTE or TEE is considered medically necessary in individuals with transient ischemic attacks or strokes with suspected atrial level shunt.
    - CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest if unclear findings from echocardiogram
- Post-procedure PFO closure
  - Post-surgical imaging as follows (PFO generally requires less frequent monitoring post device than ASDs):

        - TTE one time within 30 days of closure
        - TTE one time within 6 months of PFO closure
    - TTE or TEE is considered medically necessary at any time post-procedure when there is concern for **any** of the following:
        - Infection
        - Malposition
        - Embolization
        - Persistent shunt
            - For persistent shunt, TTE is considered medically necessary every 3 months until the finding is stable or there is a need for intervention.

Secundum ASD, Sinus Venosus ASD, Asymptomatic Isolated (ASD) and Unobstructed (PAPVR)

- Any surgical status
    - TTE is considered medically necessary for any of the following:
        - Initial evaluation of a change in clinical status and/or new concerning signs or symptoms
        - Prior to planned cardiac intervention
        - Repeat any time prior to next allowed study if concern for elevated pulmonary vascular resistance/Pulmonary hypertension
    - CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest
        - If anomalous vein or SV defect cannot be assessed on echo
        - To assess shunt or RV for considering of surgery, or if echocardiogram equivocal
    - Diagnostic heart catheterization is considered medically necessary when there is concern for pulmonary vascular disease.
- Unrepaired
    - Newborn with isolated ASD can have one repeat TTE within 2 months.
    - Small asymptomatic isolated ASD with no pulmonary hypertension can have TTE as follows:
        - Infant <6 months: every three months
        - Infant ≥6 months: repeat at one year
        - Child: Every 3 years
    - Routine surveillance for moderate ASD or PAPVR >1 vein
        - Infant: every 3 months
        - Echocardiogram (TTE) every 1 year
- Prior to planned repair of ASD
    - TTE and/or TEE
    - MRI if any residual issues unanswered by echo
- Prior to planned SV defect or PAPVR

- TTE and/or TEE
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest

- Post- ASD closure with device
  - TTE post device closure
    - 1 week
    - 1 month
    - Every 3 months
    - 1 year
    - Every 2 years
  - May repeat TTE every 3 months until the finding is stable or there is a need for intervention if there is significant residual shunt, valvular or ventricular dysfunction, arrhythmias, and/or pulmonary hypertension
- Post-surgical closure of ASD
  - TTE
    - Within the first month after surgery
    - Within the 1st year
    - Every 2 years if no residual shunt
    - Every year if there is residual shunt and no right ventricular dilation
    - Every 3 months if there is residual shunt with right ventricular dilation until the finding is stable or there is a need for intervention

Ventricular Septal Defect (VSD) (PEDCD-2.4.2)

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Criteria

All

TTE is considered medically necessary for any of the following:

- Change in clinical status and/or new concerning signs or symptoms
- Prior to planned cardiac intervention

Unrepaired

TTE

- Small muscular VSD, No Symptoms, No pulmonary hypertension
  - Newborn: 1 repeat within 2 months
  - Infant: every 6 months
  - Child: every 3 years
- Small VSD in location other than muscular
  - Newborn: 1 repeat TTE within 2 months
  - Infant: TTE every 6 months
  - Child: TTE every year
- Moderate or large VSD on medical management
  - Newborn: TTE every 2 weeks
  - Infant: every 1-month
  - Child <2 years old: TTE every 3 months
  - Child >2 years old: TTE every year

Diagnostic heart catheterization is considered medically necessary after 2 months of age when there is a right-to -left shunt to evaluate for pulmonary vascular disease.

Post Repair VSD

TTE is considered medically necessary after surgical repair as follows:

- one study within one month after surgery
- one year after surgery
- then every 2 years

TTE is considered medically necessary after transcatheter repair as follows:

- 1 month post-procedure

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- 6 months post-procedure
- 12 months post-procedure
- then every 2 years

TTE is considered medically necessary following surgical or device closure with significant residual shunt, valvular or ventricular dysfunction, arrhythmias, and/or pulmonary hypertension every 3 months.

Pediatric Cardiac Imaging Guidelines

AVSD (Atrioventricular Canal, Endocardial Cushion Defect) (PEDCD-2.4.3)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status

TTE is considered medically necessary for any of the following:
- Change in clinical status and/or new concerning signs or symptoms
- Prior to planned cardiac intervention

MRI cardiac is considered medically necessary if TTE is suboptimal regarding RV size or pulmonary and systemic blood flow.

Cardiac catheterization is considered medically necessary if there is concern for pulmonary vascular disease.

Unrepaired
- Partial/transitional atrioventricular canal (AVC)
  - TTE is considered medically necessary as follows:
    - Newborn: repeat once within the next 2 months
    - Infant: every 3 months
    - Child <1 years: every 2 months
    - Child ≥1 years: every 3 months
- Complete AVC
  - TTE
    - <3 months: TTE every 2 weeks
    - ≥3 months: TTE monthly

Repaired (TTE)
- Within one month of surgery
- Within 1 year
- Then annually

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TTE is considered medically necessary every 3 months until the finding is stable or there is a need for intervention when there is residual shunt, valvular LV dysfunction, LVOT obstruction, arrhythmia, arrhythmia or PHT, or symptoms of heart failure.

Pediatric Cardiac Imaging Guidelines

PDA (Patent Ductus Arteriosus) (PEDCD-2.4.4)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status

TTE is considered medically necessary for any of the following:
- Initial evaluation of a change in clinical status or new concerning signs or symptoms
- Prior to planned cardiac intervention

Cardiac catheterization is considered medically necessary when there is concern for pulmonary vascular disease.

Unrepaired
- Newborn: one repeat TTE in newborn period
  - None, if spontaneously closed
- >1-year-old
  - No Routine surveillance in an asymptomatic individual with a trivial, silent PDA
- Infant
  - Small PDA: TTE every 3 months
  - ≥ Moderate PDA: TTE every month
- Pre-adolescent Child
  - Small PDA: every 1 year
  - Moderate PDA: every 6 months
- Adolescent: every 3 years

Post PDA device
- Post procedure surveillance (TTE)
  - One echo in first 30 days
  - Annually for first 2 years
  - Every 5 years after first 2 years
- Post procedure LPA stenosis or aortic obstruction
  - Pre-adolescent Child
    - TTE annually

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    - MRA/CTA Chest, or (lung perfusion for LPA stenosis) if questions remain unanswered after TTE
  - Adolescents
    - Every two years TTE and
    - MRA/CTA Chest, or (lung perfusion for LPA stenosis) if questions remain unanswered after TTE

Pediatric Cardiac Imaging Guidelines

TAPVR Total Anomalous Pulmonary Venous Return (PEDCD-2.4.5)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status

- TTE, TEE, CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest, Lung perfusion scan are considered medically necessary for any of the following:
  - Change in clinical status and/or new concerning signs or symptoms
  - Prior to planned cardiac intervention

Unrepaired

- No restrictions

Repaired

- TTE one post procedure evaluation first 30 days
- TTE every 3 months in infancy
- Pre-adolescent Child: every 1 year
- Adolescence: TTE every 2 years

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Ebstein Anomaly and TV Dysplasia (PEDCD-2.4.6)

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Criteria

Any surgical status

- TTE, TEE, CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest are considered medically necessary for any of the following:
  - Change in clinical status and/or new concerning signs or symptoms
  - Prior to planned repair or intervention

Unrepaired

- Newborn: repeat study within 30 days
- Infant
  - Trivial TR is a normal finding.
  - Mild TR- TTE: every year
  - ≥ Moderate TR- TTE: every 3 months
- Child
  - Mild TR: every year TTE
  - ≥ Moderate: every 6 months

Repaired (TTE)

- Post-op within 30 days
- TTE once a year
- TTE every 6 months if valvular or ventricular dysfunction, or arrhythmias
- Pre-adolescent Child: every year
- Adolescent: every 2 years
- Every 3 months if CHF or atrial arrhythmias

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Pulmonary Stenosis (PS) (PEDCD-2.4.7)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status
- TTE is considered medically necessary for any of the following:
  - Change in clinical status and/or new concerning signs or symptoms
  - Prior to planned cardiac procedure
  - If increasing gradient, 1 additional study prior to next allowed study
  - PS in Williams syndrome (see **LVOT Lesions (PEDCD-2.4.10)**)

Unrepaired
- Neonate
  - TTE repeat study within 30 days
- Infant PS asymptotic (any severity)
  - TTE every 3 months
- Pre-adolescent Child
  - TTE every 1 year
- Adolescent
  - TTE every 2 years
  - MRA/CTA Chest if pulmonary artery dilation every 3 years

Post procedure (TTE)
- Within 30 days
- Infant
  - TTE every 3 months
- Pre-adolescent Child
  - TTE 1 year
  - Moderate or severe sequelae TTE every 6 months
- Adolescent
  - TTE every 2 years
- Any individual with heart failure: TTE every 3 months

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Pulmonary Atresia with Intact Septum (PAIVS) (PEDCD-2.4.8)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status

TTE is considered medically necessary for any of the following:

- Prior to planed repair
- Change in clinical status and/or new concerning signs or symptoms

Post procedural: Palliation

- TTE
  - 1 within 30 days
  - Every 1 month until repaired

Post procedural: Complete Repair

- TTE within 30 days post-op
- Any age
  - TTE every three months for CHF
- Infant
  - TTE at 3 months in asymptomatic infant
- Child (all ages)
  - TTE annually
  - Every 6 months if moderate sequelae
- Adolescent (in addition to TTE)
  - CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest every 3 years

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Mitral Valve Disease (PEDCD-2.4.9)

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Criteria

Any surgical status
- TTE is considered medically necessary for any of the following:
  - Prior to planned surgery
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms

Unrepaired congenital mitral valve stenosis
- Infant in first three months of life
  - Weekly TTE
- After 3 months (TTE)
  - Every 3 months if mild MS
  - Every month if ≥ moderate MS
- Child (TTE)
  - With moderate MS: every 3 months until a decision is made to intervene
  - Child with mild symptoms: annually

Unrepaired: Congenital Mitral Regurgitation (MR) including Mitral Valve Prolapse
- Infant
  - TTE every 6 months an asymptomatic infant with mild MR
  - TTE every month in asymptomatic infant with ≥ moderate MR
- Child
  - TTE every 2 years with mild MR, normal LV size and systolic function
  - TTE every 6 months with ≥ moderate MR
  - TTE every 3 years in an asymptomatic with MVP and mild MR

Post procedure, surgical or catheter based
- TTE within 30 days
- Infant
  - TTE every 3 months, mild MS or MR, and no LV dysfunction
  - TTE every month in ≥ moderate MS or MR, dilated LV, and no LV dysfunction
- Child
  - TTE annually

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- In a child with normal prosthetic mitral valve function and no LV dysfunction
- In a child with mild MS or MR, and no LV dysfunction

◦ TTE every 3 months
- In a child with ≥ moderate MS or MR, dilated LV, and no LV dysfunction
- In a child with prosthetic mitral valve or ventricular dysfunction, and/or arrhythmias

Pediatric Cardiac Imaging Guidelines

LVOT Lesions (PEDCD-2.4.10)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Subvalvular Aortic stenosis

Any surgical status

- TTE, TEE, Cardiac MR/CT are considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Preoperative
- If aortic dimension z-score >2
  - TTE or Chest CTA/MRA every 2 years if stable z-score
  - TTE or Chest CTA/MRA every 6 months if increasing z-score

Unrepaired

- Newborn: No restrictions
- Infant TTE
  - 1 monthly for any subvalvular AS, but ≤ mild AR
- Child
  - TTE one per year if mild AS and no AR
  - TTE every 6 months ≥ moderate subvalvular AS and/or mild AR
  - Routine surveillance (6–12 months) in an asymptomatic child with ≥ moderate AS and/or ≥ moderate AR

Repaired

- Infant
  - TTE within 30 days
  - TTE every 3 months ≤ mild MS and or AR
  - TTE every 1 month ≥ moderate AS or AR
- Child
  - TTE every 1 year ≤ Mild AS or AR
  - TTE every 6 months ≥ moderate AS or AR
  - TTE every 3 months if heart failure

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Aortic Valve Stenosis and/or regurgitation/ BAV (Bicuspid Aortic Valve)

Any surgical status

- TTE, TEE, Cardiac MR/CT are considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Preoperative

Unrepaired

- Infant <3 months
  - TTE 1 per week
- Infant >3 months
  - TTE every 3 months
  - TTE every 1 month, if ≥ moderate AS or AR
- Child
  - TTE every 1 year with mild AS/AR and no aortic dilation
  - TTE every 6 months with moderate AS/AR, or aortic dilation.
  - TTE every 3 years if BAV with trivial or mild valvular dysfunction and no aortic root dilation
  - Every 6 months in any as with increasing z-score aortic root ascending aorta

Post procedural

- Within 30 days TTE
- Infant
  - Every 1 month following neonatal intervention with ≥ moderate AS or AR or LV dysfunction
  - Every 3 months ≤mild AS/AR and no LV dysfunction
- Child (TTE)
  - 6 months echocardiogram if ≥moderate AS or AR
  - 1-year echocardiogram if ≤mild AS or AR, and/or normal prosthetic valve
  - Every 3 months if CHF or Ventricular dysfunction

Supravalvular AS

Any surgical status

- TTE, TEE, CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest are considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Preoperative
  - Williams syndrome

        - Individuals with Williams syndrome can be screened/evaluated for arch abnormalities and pulmonary artery abnormalities and coronary artery abnormalities with the same intervals as TTE referenced below.
    - Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI) is considered medically necessary at initial evaluation and for cardiac symptoms, change in clinical status, and/or new concerning signs or symptoms

Unrepaired

- Infant
    - TTE every 3 months
- Child
    - TTE every 1 year
    - TTE every 6 months if moderate AS

Post-operative (TTE)

- Within 30 days
- Every 2 years in mild to moderate AS
- Every 6 months if ≥ moderate AS

Pediatric Cardiac Imaging Guidelines

Aortic Coarctation and IAA (Interrupted Aortic Arch) (PEDCD-2.4.11)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

All individuals

- TTE, MRA/CTA Chest are considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Prior to planned surgery/intervention
- Cardiac MR/CT is considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Prior to planned surgery/intervention if any issues remain not answered on echo

For screening for related intracranial aneurysms, see **Cerebral Intracranial Aneurysms (HD-12.1)**.

Unrepaired Aortic Coarctation

- Newborn, TTE weekly if assessing for ductal closure
- Infant with mild coarctation in absence of PDA
  - Echocardiogram every 3 months
- Child with mild coarctation
  - Echocardiogram every 1 year
  - MRA Chest, CTA Chest every 3 years

Post procedure: surgical or catheter based

- TTE
  - Within 30 days of procedure
  - Every 3 months if mild or no sequelae in first year
  - Every 6 months if mild or no sequelae in the second year
  - Every 1 year after the second year
  - Every 3 months at any time if CHF symptoms or ≥ moderate sequelae
- MRA/CTA Chest every 3 years (include Cardiac MR/CT if issues not clarified on echo)

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- For screening for intracranial aneurysms, see **Cerebral Intracranial Aneurysms (HD-12.1)**.

Pediatric Cardiac Imaging Guidelines

Coronary Anomalies (PEDCD-2.4.12)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Suspected Anomalous Coronary Artery

CCTA to rule out anomalous coronary artery is considered medically necessary for the following:

- to map an anomalous coronary artery prior to an invasive procedure
- previous imaging study did not clearly demonstrate an anomalous coronary artery

Baseline Imaging

For baseline imaging in an individual with anomalous coronary artery, the following imaging/procedures are considered medically necessary:

- TTE
- CCTA or CMR
- Stress imaging
- Cardiac PET when TTE, CCT/CCTA, and CMR are inconclusive or suboptimal
- Diagnostic heart catheterization when other imaging is inconclusive, suboptimal, or fails to provide information essential to treatment planning

New or Worsening Symptoms/Change in Clinical Status

For new or worsening symptoms or change in clinical status in an individual with anomalous coronary artery, the following imaging/procedures are considered medically necessary:

- TTE
- CCT **or** CMR
- MRA Chest or CTA Chest when not previously performed **or** the origin of the coronaries arteries is not at the level of the Sinus of Valsalva
- Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI)- to assess the need for surgery

Pre-intervention Planning

Prior to surgery for anomalous coronary artery, the following imaging/procedures are considered medically necessary:

- TTE

- CCT **or** CMR
- MRA Chest or CTA Chest when not previously performed **or** the origin of the coronaries arteries is not at the level of the Sinus of Valsalva
- Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI)- to assess the need for surgery

Post-procedure Imaging

Post-procedure for anomalous coronary artery, the following imaging/procedures are considered medically necessary:

- TTE
  - Within 30 days of procedure
  - Monthly the first year following repair
  - Every 3 months after first year of surgery
  - Annually after the second year of surgery
  - Every 3 months if ventricular dysfunction
- Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI)
  - First postoperative year
  - If EKG stress test positive of equivocal

Surveillance Imaging

For surveillance of anomalous coronary artery, the following imaging/procedures are considered medically necessary:

- TTE and Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI) every 2 years for anomalous right coronary artery from the left aortic sinus
- TTE and Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI) annually for unrepaired or incompletely repaired, anomalous left coronary artery from the right coronary sinus
- TTE every 2 years for a small coronary fistula
- TTE annually for a moderate or large coronary fistula

Background and Supporting Information

CPT® 75574 for evaluating coronary artery anomalies

CPT® 75573 for congenital heart disease

CTA Chest CPT® 71275 can be added to evaluate great vessels.

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Tetralogy of Fallot (TOF) (PEDCD-2.4.13)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status
- TTE, CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Evaluation prior to planed pulmonary valve replacement, cardiac intervention, or surgery

Unrepaired
- Newborn: TTE no limits
- Infant: every 1-month

Post procedure palliation
- TTE every one-month following palliative procedure prior to complete repair, valvuloplasty, PDA and/or RVOT stenting, or shunt placement before complete repair

Post-operative TOF (initial repair)
- TTE
  - Within 30 days of repair
  - Pre-adolescent Child: every 12 months
  - Adolescent: every 24 months
  - Every 6 months in an individual with valvular dysfunction other than pulmonary valve, RVOT obstruction, branch pulmonary artery stenosis, arrhythmias, or presence of an RV-to-PA conduit
  - TTE every 3 months if CHF
- Cardiac MR/CT, MRA/CTA Chest
  - Routine surveillance (36 months) in an individual with pulmonary regurgitation and preserved ventricular function
  - 12 months if moderate (≥150 mL/m^2) or progressive (increase of >25 mL/m^2) RV dilatation or dysfunction (RVEF ≤48% or ≥6% decrease in EF) or nearing imaging criteria for PVR

Post-surgical or catheter based pulmonary valve replacement
- TTE

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  - Within 30 days follow-up
  - 1 and 6 months after replacement
  - One year post procedure
  - Annually after replacement
  - Every 6 months if RV-to-PA conduit dysfunction, valvular or ventricular dysfunction, branch pulmonary artery stenosis or arrhythmias
  - Every 3 months if CHF symptoms
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest every 2 years

Pediatric Cardiac Imaging Guidelines

Double Outlet Right Ventricle (DORV) (PEDCD-2.4.14)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status

- TTE, CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest are considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Evaluation prior to repair

Unrepaired

- TTE
  - Newborn: no limit
  - Monthly infant with balanced systemic and pulmonary circulation
  - Every 3 months child with balanced circulation

Postoperative

- TTE
  - Within 30 days
  - First year post-op every 6 months
  - After one year, TTE every 1 year
  - TTE 3 months in an individual with valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, branch pulmonary artery stenosis, arrhythmias, or presence of an RV-to-PA conduit, heart failure
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest
  - 3 years for asymptomatic individual

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D-Loop Transposition of the Great Arteries (D-Loop TGA) (PEDCD-2.4.15)

CDP.CHD.0002.4.A
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Criteria

Any surgical status

- **TTE, CMR and/or MRA Chest or CCT/CCTA and/or CTA Chest**, **Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI)** are considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Any time after procedure involving coronary arteries
- **CMR and/or MRA Chest or CCT/CCTA and/or CTA Chest** every 5 years.

Unrepaired (TTE)

- No Limits

Post arterial switch

- TTE
  - Within 30 days of repair
  - Infant: every one month
  - Child: every 3 months
  - Child with ≥ moderate sequelae: TTE every three 3 months (moderate valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, branch pulmonary artery stenosis, or arrhythmias
- Routine CMR/CT
  - Every 3 years
  - Every year if neo-aortic insufficiency
- MRA/CTA Chest
  - Every 3 years
  - Every year if neo-aortic insufficiency or aortic dilation
- Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI)
  - 1 routine test after arterial switch at any time

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Post Rastelli

- TTE
  - Within 30 days
  - Every three months following procedure for one year
  - Pre-adolescent Child: Every 6 months following the first year after repair if no or mild sequelae
  - Adolescent: annually
  - Every three months if moderate valvular dysfunction, LVOT obstruction, presence of an RV-to-PA conduit, branch, pulmonary artery stenosis, or arrhythmias, or heart failure
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest every 3 years

Post atrial switch

- TTE Every 1 year if mild to no symptoms
  - Every 3 months TTE, and CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest if ≥moderate systemic AV, valve regurgitation, systemic RV dysfunction, LVOT obstruction, or arrhythmias, or CHF
  - Routine **CMR and/or MRA Chest or CCT/CCTA and/or CTA Chest** every 3 years

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Congenitally Corrected Transposition of the Great Arteries (ccTGA, LTGA) (PEDCD-2.4.16)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status

- TTE, TEE, **CMR and/or MRA Chest or CCT/CCTA and/or CTA Chest** are considered medically necessary for any of the following:
  - Change clinical status and/or new concerning signs or symptoms
  - Preoperative evaluation (typically within one month)
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest every 3 years

Unrepaired

- TTE
  - Newborn: weekly
  - Infant
    - Every 3 months if no cardiac symptoms and only mild findings
    - Every 1 month is cardiac symptoms and moderate findings
  - Child
    - <2 years: every 3 months
    - >2 years: every 1 year
    - Every 6 months if ≥moderate AV regurgitation
    - Every 3 months if CHF symptoms
  - CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest
    - Every 3 years

Postoperative: Anatomic Repair

- TTE
  - Post–operative evaluation (within 30 days)
  - Every 3 months within a year following repair in an asymptomatic individual with no or mild sequelae
  - Every 1 year after the first year following repair in an asymptomatic individual with no or mild sequelae

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  - Every 6 months if valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, or presence of a RV-to-PA conduit
  - Every 3 months if CHF symptoms
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest
  - Every 3 years

Postoperative: Physiological Repair with VSD Closure and/or Left Ventricle-to-Pulmonary Artery (LV-to-PA) Conduit

- TTE
  - Postoperative evaluation (within 30 days)
  - Every 3 months within a year following repair in an asymptomatic individual with no or mild sequelae
  - Annually in an asymptomatic individual with no or mild sequelae
  - Every 3 months if in an individual with ≥ moderate systemic AV valve regurgitation, systemic RV dysfunction, and/or LV-to-PA conduit dysfunction, or with CHF symptoms
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest every 3 months in an individual with ≥ moderate systemic AV valve regurgitation, systemic RV dysfunction, and/or LV-to-PA conduit dysfunction, or with CHF symptoms

Truncus Arteriosus (PEDCD-2.4.17)

CDP.CHD.0002.4.A
v1.0.2027

Criteria

Any surgical status

- TTE, CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest are considered medically necessary for any of the following:
  - Initial evaluation of change in clinical status and/or new concerning signs or symptoms
  - Prior to planned intervention or surgery

Postoperative

- TTE
  - Within 30 days
  - Monthly in first year after surgery
  - After first year every 6 months
  - Every 3 months if
    - ≥ moderate truncal stenosis or regurgitation
    - Residual VSD or RV to PA conduit or Branch PA obstruction
    - Symptoms of CHF
- CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest
  - Annually if ≥ moderate Truncal stenosis or regurgitation

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Single Ventricle (SV) (PEDCD-2.4.18)

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Criteria

SV references individuals not amenable to biventricular repair, including but not limited to hypoplastic left heart syndrome, tricuspid atresia, double inlet left ventricle, mitral atresia, unbalanced AVSD, and forms of PA/IVS.

Any surgical status

- Any/All: **TTE, TEE, CMR and/or MRA Chest or CCT/CCTA and/or CTA Chest, and Diagnostic heart catheterization** (CPT® 93593, 93594, 93595, or 93597) are considered medically necessary for any of the following:
  - Change clinical status and/or new concerning signs or symptoms
  - Preoperative evaluation (typically within one month)

Unrepaired SV

- TTE allowed one study per week

Stage I palliation (includes Norwood Procedure, PA Banding, and Hybrid Procedures)

- Routine weekly TTE is considered medically necessary.

Stage II palliation (includes Glenn anastomosis procedure and hemi Fontan)

- Within 30 days after surgical or catheterization intervention
- One TTE per month is considered medically necessary.

Stage III also called Fontan

- TTE within 30 days
- TTE every three months within first post-op year
- Every 6 months after first year
- Every 3 years allow **CMR and/or MRA Chest or CCT/CCTA and/or CTA Chest**
- TTE every 3 months until the finding is stable or there is a need for intervention if there is valvular dysfunction, arrhythmias, heart failure

Surveillance

Diagnostic heart catheterization is considered medically necessary for all Single Ventricles once every 10 years.

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Eisenmenger and PHT (with CHD)-(PEDCD-2.4.19)

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Criteria

Any surgical status

- TTE, CMR **and/or** MRA Chest **or** CCT/CCTA **and/or** CTA Chest are considered medically necessary for any of the following:
  - Change clinical status and/or new concerning signs or symptoms
  - Preoperative evaluation (typically within one month)

Initial evaluation (TTE)

- Change in clinical status and/or new concerning signs or symptoms
- Before and after PHT therapy

Eisenmenger Syndrome (ES) individual

- TTE every 6 months

PHT associate with CHD

- TTE is medically necessary at the frequency requested by the provider for individuals with unrepaired disease and evidence of elevated pulmonary vascular resistance.
- TTE and CCT **or** CMR for changes in change in pulmonary arterial hypertension-targeted therapy in an individual with postoperative PH
- TTE every 3 months in postoperative stable child with PHT

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Evidence Discussion

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Congenital Heart Disease

Tetralogy of Fallot (TOF)

Tetralogy of Fallot is one of the most extensively studied forms of repaired congenital heart disease. Although surgical survival is excellent, long-term follow-up studies have demonstrated ongoing risk for pulmonary regurgitation, right ventricular (RV) dilation, ventricular dysfunction, arrhythmias, branch pulmonary artery stenosis, and sudden cardiac death (Valente et al., 2014). Because progressive RV enlargement may occur years before symptoms develop, routine surveillance is considered essential to identify individuals who may benefit from pulmonary valve replacement before irreversible ventricular dysfunction occurs. The American Society of Echocardiography multimodality imaging guidelines emphasize the complementary roles of transthoracic echocardiography (TTE) and cardiovascular magnetic resonance imaging (CMR), with CMR considered the reference standard for quantification of RV volumes and pulmonary regurgitation severity (Valente et al., 2014; Sachdeva et al., 2020).

Current evidence supports periodic echocardiographic surveillance following repair, with advanced imaging used to evaluate progressive RV dilation, ventricular dysfunction, conduit failure, branch pulmonary artery stenosis, and pulmonary valve dysfunction. More frequent surveillance is warranted when there is evidence of ventricular dysfunction, significant pulmonary regurgitation, arrhythmias, or suspected need for reintervention (Sachdeva et al., 2020).

D-Loop Transposition of the Great Arteries (D-TGA)

Long-term outcomes after repair of D-transposition of the great arteries have improved substantially, but residual cardiovascular morbidity remains common. Individuals who undergo arterial switch operations may develop neoaortic root enlargement, neoaortic insufficiency, coronary artery abnormalities, pulmonary artery stenosis, ventricular dysfunction, and arrhythmias later in life (Cohen et al., 2016). Because coronary artery manipulation is intrinsic to the arterial switch procedure, continued monitoring of coronary anatomy and ventricular performance remains important even in asymptomatic individuals.

Professional society imaging guidelines recommend serial echocardiography with periodic CMR or cardiac CT to evaluate ventricular function, neoaortic dimensions, and coronary anatomy when echocardiographic assessment is incomplete (Cohen et al., 2016; Sachdeva et al., 2020). Individuals undergoing atrial switch or Rastelli

procedures have additional risks including systemic right ventricular dysfunction, conduit degeneration, atrioventricular valve regurgitation, and arrhythmias, often requiring more intensive surveillance than arterial switch recipients.

Single Ventricle Physiology and Fontan Circulation

Individuals with single ventricle physiology and Fontan circulation represent one of the highest-risk populations within congenital heart disease. The American Heart Association scientific statement on Fontan circulation identified substantial long-term risks including ventricular dysfunction, atrioventricular valve regurgitation, arrhythmias, thromboembolism, protein-losing enteropathy, lymphatic dysfunction, hepatic disease, and heart failure (Rychik et al., 2019). These complications may develop despite stable clinical status, supporting the need for continued surveillance throughout childhood and adulthood.

Comparative studies have demonstrated important limitations of echocardiography for assessment of ventricular volumes and function in Fontan patients, with CMR providing superior quantitative evaluation of ventricular performance and anatomy (Margossian et al., 2009). The AHA scientific statement recommends periodic advanced imaging and selective cardiac catheterization because hemodynamic abnormalities may not be fully appreciated by noninvasive testing alone (Rychik et al., 2019).

Double Outlet Right Ventricle (DORV)

Published evidence regarding postoperative surveillance in DORV consists primarily of observational studies, surgical outcome series, and congenital heart disease imaging guidelines. Long-term complications following repair include ventricular dysfunction, residual ventricular outflow tract obstruction, conduit degeneration, branch pulmonary artery stenosis, arrhythmias, and residual shunting (Sachdeva et al., 2020).

Because anatomic variability is substantial, professional society recommendations emphasize individualized follow-up using serial echocardiography and advanced imaging when ventricular function, conduit anatomy, or pulmonary artery anatomy cannot be adequately assessed with echocardiography alone (Prakash et al., 2010; Sachdeva et al., 2020). Although precise surveillance intervals are largely consensus-based, ongoing monitoring is supported by the recognized risk of reintervention and progressive postoperative complications.

Congenitally Corrected Transposition of the Great Arteries (ccTGA)

Individuals with congenitally corrected transposition of the great arteries remain at lifelong risk for systemic right ventricular dysfunction, systemic atrioventricular valve regurgitation, conduction abnormalities, arrhythmias, and progressive heart failure. These complications develop gradually and may be clinically silent during

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early stages, making serial imaging essential for timely identification of disease progression (Sachdeva et al., 2020).

CMR has become increasingly important because assessment of systemic right ventricular size and function can be challenging using echocardiography alone. Contemporary congenital heart disease imaging guidelines support periodic advanced imaging in addition to echocardiography to monitor ventricular performance and valvular disease (Sachdeva et al., 2020; Hundley et al., 2010).

Truncus Arteriosus

Contemporary surgical outcomes for truncus arteriosus have improved significantly; however, long-term morbidity remains substantial because of conduit degeneration, truncal valve dysfunction, branch pulmonary artery stenosis, ventricular dysfunction, and the need for repeat intervention. Serial imaging is important because conduit and truncal valve deterioration may progress before significant clinical symptoms develop (Sachdeva et al., 2020).

Echocardiography remains the primary surveillance modality, while CMR and CT may provide additional evaluation of conduit anatomy, ventricular function, and branch pulmonary arteries when echocardiographic assessment is limited (Prakash et al., 2010; Sachdeva et al., 2020).

Coronary Artery Anomalies

Congenital coronary artery anomalies are recognized causes of myocardial ischemia, exercise-related symptoms, and sudden cardiac death in children and young adults. Echocardiography serves as the initial diagnostic test; however, cross-sectional imaging frequently provides superior visualization of coronary origin and course. Current multimodality imaging recommendations support the use of coronary CTA and CMR when coronary anatomy cannot be adequately defined by echocardiography or when procedural planning is required (Truong et al., 2012; Sachdeva et al., 2020).

Functional testing with stress imaging may provide additional information regarding ischemic burden and aid decisions regarding intervention. Individuals who undergo repair require ongoing surveillance to assess ventricular function, coronary patency, and exercise-related ischemia (Sachdeva et al., 2020).

Kawasaki Disease-Associated Coronary Artery Disease

The 2024 American Heart Association Scientific Statement on Kawasaki disease reinforced the importance of risk-stratified cardiovascular surveillance based on coronary artery involvement. Echocardiography remains the primary imaging modality for diagnosis and follow-up, while coronary CTA, CMR, and invasive angiography play increasingly important roles for individuals with medium, large, or giant coronary aneurysms (Jone et al., 2024).

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Recent registry studies demonstrate that small aneurysms frequently regress and are associated with very low long-term event rates, whereas large and giant aneurysms are associated with persistent risk of thrombosis, stenosis, myocardial infarction, and need for coronary intervention (Jone et al., 2024). Current AHA recommendations support increasingly intensive surveillance, including stress imaging and advanced coronary imaging, as aneurysm size increases.

Pediatric Cardiac Imaging Guidelines

References (PEDCD-2)

CDP.CHD.0002.4.A
v1.0.2027

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Heart Murmur

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Heart Murmur (PEDCD-3.1)

CDP.CS.003.1.A
v1.0.2027

Criteria

When evaluating an individual with a murmur for the first time, it will not be known whether the individual has congenital heart disease or not.

- Any one of the TTE code combinations is considered medically necessary for evaluation of either:
  - Documentation of any pathologic murmur
  - Any murmur with associated cardiac signs or symptoms
- Repeat echocardiography is considered not medically necessary if the initial echocardiogram was normal and the murmur has not changed in quality.

Initial pediatric TTE combinations

CPT® 93303, CPT® 93306, CPT® 93320, and CPT® 93325
CPT® 93303, CPT® 93320, and CPT® 93325
CPT® 93303, CPT® 93306
CPT® 93306 (CPT® 93320 and CPT® 93325 are included with CPT® 93306 and should not be approved separately)

Evidence Discussion

A 2022 review used evidence from diagnostic studies, systematic review data, cost analyses, and appropriate use criteria to evaluate murmur assessment, referral, and echocardiography. Outcome data included diagnostic classification of innocent versus pathologic murmurs, congenital heart disease detection, test accuracy, cost-effectiveness, and referral appropriateness. Reported diagnostic performance included physician examination sensitivity of 79.7% and specificity of 88.5% for distinguishing pathologic from innocent murmurs. The review noted that echocardiography is appropriate for pathologic-sounding murmurs or murmurs associated with cardiovascular signs or symptoms, while echocardiography is rarely appropriate for innocent-sounding murmurs without symptoms, concerning examination findings, or family history. In newborns and infants with concerning murmurs, pediatric cardiology referral is preferred before reflex echocardiography, and routine ECG or chest radiography is not supported because these tests may misclassify murmurs (Ford et al., 2022).

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Chest Pain

Guideline Page

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Suspected Cardiac Chest Pain (PEDCD-4.1)

CDP.CS.0004.1.A
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Criteria

- Any one of the TTE combinations below is considered medically necessary to evaluate chest pain when **one** or more of the following applies:
  - Exertional chest pain
  - Non-exertional chest pain with abnormal EKG
  - Chest pain with signs or symptoms of pericarditis
  - First-degree relative with sudden unexplained death or cardiomyopathy
  - Recent onset of fever
  - Recent illicit drug use
  - Other signs or symptoms of cardiovascular disease
- Repeat TTE is considered medically necessary after a normal initial TTE when **any** of the following conditions is present:
  - Increased severity or change in quality of the chest pain
  - New signs or symptoms of cardiovascular disease other than pain
  - New abnormality on EKG
- CMR or CCT if prior evaluation suggests cardiomyopathy, myocarditis, or coronary artery abnormality
- CTA Chest **or** MRA Chest if pulmonary embolism or aortic dissection is suspected
- Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI) is considered medically necessary to evaluate chest pain in the setting of **any** of the following:
  - Other imaging suggests coronary artery abnormality.
  - ETT suggests ischemia.
  - EKG is uninterpretable.
  - Any indication in section **Stress Testing with Imaging (CD-1.4)** in the Cardiac Imaging Guidelines.

Coding

Initial pediatric TTE combinations

CPT® 93303, CPT® 93306, CPT® 93320, and CPT® 93325

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CPT® 93306 (CPT® 93320 and CPT® 93325 are included with CPT® 93306 and should not be approved separately)

Codes	Description
93351	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report; including performance of continuous electrocardiographic monitoring, with supervision by a physician or other qualified health care professional
93350	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report;
71275	Computed tomographic angiography, chest (noncoronary), with contrast material(s), including noncontrast images, if performed, and image postprocessing
71555	Magnetic resonance angiography, chest (excluding myocardium), with or without contrast material(s)
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 lv cardiac function, rv structure and function and evaluation of venous structures, if performed)
75557	Cardiac magnetic resonance imaging for morphology and function without contrast material;
75559	Cardiac magnetic resonance imaging for morphology and function without contrast material; with stress imaging

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Codes	Description
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences;
75563	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences; with stress imaging
78430	Myocardial imaging, positron emission tomography (PET), perfusion study (including ventricular wall motion[s] and/or ejection fraction[s], when performed); single study, at rest or stress (exercise or pharmacologic), with concurrently acquired computed tomography transmission scan
78431	Myocardial imaging, positron emission tomography (PET), perfusion study (including ventricular wall motion[s] and/or ejection fraction[s], when performed); multiple studies at rest and stress (exercise or pharmacologic), with concurrently acquired computed tomography transmission scan
78432	Myocardial imaging, positron emission tomography (PET), combined perfusion with metabolic evaluation study (including ventricular wall motion[s] and/or ejection fraction[s], when performed), dual radiotracer (eg, myocardial viability);
78433	Myocardial imaging, positron emission tomography (PET), combined perfusion with metabolic evaluation study (including ventricular wall motion[s] and/or ejection fraction[s], when performed), dual radiotracer (eg, myocardial viability); with concurrently acquired computed tomography transmission scan
78451	Myocardial perfusion imaging, tomographic (spect) including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); single study, at rest or stress (exercise or pharmacologic)
78452	Myocardial perfusion imaging, tomographic (spect) (including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); multiple studies, at rest and/or stress (exercise or pharmacologic) and/or redistribution and/or rest reinjection

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Evidence Discussion

Pediatric chest pain is uncommon from a cardiac source with concerning etiologies including hypertrophic obstructive cardiomyopathy or other left ventricular outflow obstruction when chest pain occurs with abnormal history or examination findings. (Campbell et al., 2014). Cardiovascular magnetic resonance is supported as a selected diagnostic test when pediatric chest pain is associated with suspected myocarditis, elevated troponin, pericardial disease, cardiomyopathy, coronary anomalies, or other abnormal cardiac testing, but not as routine screening in otherwise low-risk patients (Dorfman et al., 2022).

Pediatric Cardiac Imaging Guidelines

References (PEDCD-4)

CDP.CS.0004.1.A
v1.0.2027

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Syncope

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Syncope (PEDCD-5.1)

CDP.CS.0005.1.A
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Criteria

- TTE is considered medically necessary for pediatric individuals with syncope and one or more of the following:
  - Exertional syncope
  - Unexplained post-exertional syncope
  - Abnormal EKG
  - Absence of prodromal symptoms
  - Presence of preceding palpitations within seconds of loss of consciousness
  - Lack of a prolonged upright posture
  - Syncope in response to auditory or emotional
  - First-degree relative with either of the following before age 50:
    - Sudden cardiac arrest or death
    - Pacemaker or implantable defibrillator placement
  - First-degree relative with cardiomyopathy
  - Known congenital heart disease
  - History of Kawasaki disease, or other coronary pathology
  - Pathologic murmur, irregular rhythm, gallop, or click on physical examination
- Repeat TTE is considered medically necessary after a previously normal TTE when **one** of the following conditions is present:
  - Increased severity or change in characteristics of the syncope
  - New signs or symptoms of cardiovascular disease other than syncope
  - Family of history of sudden death, cardiomyopathy
  - New abnormality on EKG
- CCT **or** CMR is considered medically necessary when TTE suggests coronary artery abnormalities, cardiomyopathy, or myocarditis.
- MRA or CTA Chest if pulmonary embolism or aortic dissection is suspected
- Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI) is considered medically necessary (any):
  - If other imaging suggests coronary artery abnormality
  - ETT suggests ischemia
  - EKG is uninterpretable
  - Any indication in section **Stress Testing with Imaging (CD-1.4)** in the Cardiac Imaging Guidelines

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Coding

Initial pediatric TTE combinations

CPT® 93303, CPT® 93306, CPT® 93320, and CPT® 93325
CPT® 93303, CPT® 93320, and CPT® 93325
CPT® 93303, CPT® 93306
CPT® 93306 (CPT® 93320 and CPT® 93325 are included with CPT® 93306 and should not be approved separately)

Codes	Description
93351	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report; including performance of continuous electrocardiographic monitoring, with supervision by a physician or other qualified health care professional
93350	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report;
71275	Computed tomographic angiography, chest (noncoronary), with contrast material(s), including noncontrast images, if performed, and image postprocessing
71555	Magnetic resonance angiography, chest (excluding myocardium), with or without contrast material(s)
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 lv cardiac function, rv structure and function and evaluation of venous structures, if performed)
75557	Cardiac magnetic resonance imaging for morphology and function without contrast material;

Codes	Description
75559	Cardiac magnetic resonance imaging for morphology and function without contrast material; with stress imaging
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences;
75563	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences; with stress imaging
78430	Myocardial imaging, positron emission tomography (PET), perfusion study (including ventricular wall motion[s] and/or ejection fraction[s], when performed); single study, at rest or stress (exercise or pharmacologic), with concurrently acquired computed tomography transmission scan
78431	Myocardial imaging, positron emission tomography (PET), perfusion study (including ventricular wall motion[s] and/or ejection fraction[s], when performed); multiple studies at rest and stress (exercise or pharmacologic), with concurrently acquired computed tomography transmission scan
78432	Myocardial imaging, positron emission tomography (PET), combined perfusion with metabolic evaluation study (including ventricular wall motion[s] and/or ejection fraction[s], when performed), dual radiotracer (eg, myocardial viability);
78433	Myocardial imaging, positron emission tomography (PET), combined perfusion with metabolic evaluation study (including ventricular wall motion[s] and/or ejection fraction[s], when performed), dual radiotracer (eg, myocardial viability); with concurrently acquired computed tomography transmission scan
78451	Myocardial perfusion imaging, tomographic (spect) including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); single study, at rest or stress (exercise or pharmacologic)
78452	Myocardial perfusion imaging, tomographic (spect) (including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); multiple studies, at rest and/or stress (exercise or pharmacologic) and/or redistribution and/or rest reinjection

Evidence Discussion

Ford et al. (2022) identified syncope or near-syncope, particularly when exertional, as a sign or symptom suggesting possible cardiac disease, including aortic stenosis, hypertrophic cardiomyopathy, or anomalous coronary artery origin. The review supports selective cardiology referral and cardiac imaging when syncope is associated with pathologic murmur features, abnormal cardiovascular examination, concerning family history, exertional symptoms, or other cardiac signs. Dorfman et al. (2022) supports CMR as a selected modality when syncope raises concern for cardiomyopathy, arrhythmogenic substrate, myocarditis, coronary disease, or structural abnormalities not fully characterized by echocardiography.

Syncope in pediatric individuals is common, with up to 15% of individuals experiencing at least one episode by age 21. Syncope is caused by neurocardiogenic syndrome (vasovagal syncope) in 75% to 80% of cases, which is a benign and self-limiting condition. Despite this, syncope causes great anxiety for parents resulting in requests for testing.

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References (PEDCD-5)

CDP.CS.0005.1.A
v1.0.2027

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Kawasaki Disease

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Kawasaki Disease (KD) (PEDCD-6)

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Kawasaki Disease Initial Imaging (PEDCD-6.1)

Criteria

- TTE is considered medically necessary for initial assessment of suspected or known Kawasaki disease.
  - CCTA (CPT® 75574), CMR without contrast (CPT® 75557), CMR without and with contrast (CPT® 75561), or MRA Chest (CPT® 71555) is considered medically necessary when TTE is inconclusive or suboptimal or for coronary artery abnormalities.
  - MRA or CTA (contrast as requested) of the affected body area is considered medically necessary for evaluation of signs or symptoms suggesting aneurysm development.

Kawasaki Disease - Acute Phase (PEDCD-6.2)

Criteria

- TTE is considered medically necessary in the acute phase of KD as follows:
  - In uncomplicated presentations at the following intervals after treatment:
    - Within 1 to 2 weeks
    - Within 4 to 6 weeks
  - Twice per week or more when there are evolving coronary artery abnormalities (z-score >2.5) detected during the acute illness until luminal dimensions have stopped progressing.
  - At the following intervals when there are expanding large or giant aneurysms:
    - Twice per week while dimensions are expanding rapidly
    - Once weekly after dimension is stabilized for the first 45 days of illness
    - Then, monthly until the third month after illness onset
- CCTA, or CMR, or coronary angiography is considered medically necessary in the acute phase in severe cases to evaluate proximal coronary artery abnormalities when results will impact management decisions.
- TTE, CMR, and CCTA are considered medically necessary when **both**:
  - Visualization of the coronary arteries with TTE is inadequate **and**
  - Results will impact immediate management decisions.

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- TTE is considered medically necessary when atypical KD is being considered.
- Repeat TTE is considered medically necessary when treatment decisions will be affected by results (e.g., treating with intravenous immunoglobulin (IVIg)), or when new signs or symptoms (such as typical peeling) develop.

Kawasaki Disease - Chronic Phase Imaging Criteria (PEDCD-6.3)

Criteria

Symptomatic individuals

- TTE is considered medically necessary at any time with new or progressing cardiac symptoms.
- Imaging stress test (Stress Echo, Stress-perfusion CMR, SPECT MPI, or PET MPI) is considered medically necessary when there are new or progressing symptoms of ischemia or ventricular dysfunction
- Diagnostic heart catheterization or imaging coronary angiography (CTA or MRA) is considered medically necessary when the above studies are positive, inconclusive, or otherwise lead to a conclusion that intervention is needed.

Long-term routine surveillance in asymptomatic imaging for Kawasaki disease

AHA risk level	Largest Aneurysm At Any Point	Largest Current Aneurysm	Routine Echo	Routine Stress Imaging	Routine Coronary Imaging
All			All risk levels 4-6 weeks after acute illness		
1	Normal	Normal	One echo 2-12 months after acute illness	none	none
2	Dilation	Dilation	6 months One year If dilation remains echo every 2-5 years until resolves	none	none

AHA risk level	Largest Aneurysm At Any Point	Largest Current Aneurysm	Routine Echo	Routine Stress Imaging	Routine Coronary Imaging
		Normal	After acute illness: 2-12 months One echocardiogram at one year No echocardiogram after one year		
3.1	Small	Small	6 months 12 months then yearly	3 to 5 years	CCTA at 1 year then every 3-5 years
3.2	Small	Normal or dilated	12 months Then every 5 years	3-5 years	CCTA at 1 year then with inducible ischemia on stress imaging
4.1	Medium	Medium	3 months 6 months 12 months Every 6-12 months after that	2 to 5 years	CCTA at 1 year then every 2-5 years
4.2	Medium	Small	6 months and 12 months, every 1 year	3 to 5 years	CCTA at 1 year then every 3-5 years

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AHA risk level	Largest Aneurysm At Any Point	Largest Current Aneurysm	Routine Echo	Routine Stress Imaging	Routine Coronary Imaging
4.3	Medium	Normal Or Dilated	6 months and 12 months then every 2 years	4 to 5 years	6 months and 12 months then if inducible ischemia on stress imaging
5.1	Large	Large	1 month 3 months 6 months 9 months 12 months Then every 6 to 12 months	6-12 months	CCTA or cardiac catheteriza-tion at 2-6 months then every 1-5 years
5.2	Large	Medium	3 months 6 months 9 months 12 months Then every 6-12 months	2 to 5 years	CCTA at 1 year then every 2-5 years
5.3	Large	Small	3 months 6 months 9 months 12 months Every 12 months	2 to 5 years	CCTA at 1 year then every 2-5 years

AHA risk level	Largest Aneurysm At Any Point	Largest Current Aneurysm	Routine Echo	Routine Stress Imaging	Routine Coronary Imaging
5.4	Large	Normal Or Dilation	3 months 6 months 9 months 12 months Every 1-2 years	3-5 years	CCTA at 1 year then every 3-5 years

**Adapted from: Jone, P. N., Tremoulet, A., Choueiter, N., Dominguez, S. R., Harahsheh, A. S., Mitani, Y., Zimmerman, M., Lin, M. T., Friedman, K. G., & American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young; Council on Cardiovascular and Stroke Nursing; Council on Cardiovascular Radiology and Intervention; and Council on Clinical Cardiology (2024). Update on Diagnosis and Management of Kawasaki Disease: A Scientific Statement From the American Heart Association. Circulation, 150(23), e481–e500. https://doi.org/10.1161/CIR.0000000000001295

Evidence Discussion

Acute Phase

- The acute phase of Kawasaki disease (KD) can last up to 4-6 weeks from the onset of fever until acute systemic inflammation has resolved and coronary artery dimensions are no longer expanding.
- Based on AHA recommendations, the following classifications are used in risk stratification of coronary artery abnormalities (McCrindle et al. 2017):
  - Z-score classification accounts for the effects of body size and age through use of baseline coronary dimensions adjusted for body surface area. The z-score value represents the number of standard deviation above the mean. (e.g., z=0 pt. has coronary artery dimension value equal to mean, z=2 person has value 2 standard deviation above the mean, based on age, gender, BSA).
  - Coronary Artery Abnormalities Risk Classification based on z-score:
    - 1 - No involvement at any time point (z-score always <2)
    - 2 - Dilation only (z-score 2 to <2.5)
    - 3 - Small aneurysm (z-score ≥2.5 to <5)

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        - 3.1 - Current or persistent
        - 3.2 - Decreased to dilation only or normal luminal dimension
      - 4 - Medium aneurysm (z-score ≥5 to <10, and absolute dimension <8 mm)
        - 4.1 - Current or persistent
        - 4.2 - Decreased to small aneurysm
        - 4.3 - Decreased to dilation only or normal luminal dimension
      - 5 - Large and giant aneurysm (z-score ≥10, or absolute dimension ≥8 mm)
        - 5.1 - Current or persistent
        - 5.2 - Decreased to medium aneurysm
        - 5.3 - Decreased to small aneurysm
        - 5.4 - Decreased to dilation only or normal luminal dimension
    - Additional clinical features that may increase the long-term risk of myocardial ischemia:
      - Greater length and distal location of aneurysms that increase the risk of flow stasis
      - Greater total number of aneurysms
      - Greater number of branches affected
      - Presence of luminal irregularities
      - Abnormal characterization of the vessel walls (calcification, luminal myofibroblastic proliferation)
      - Presence of functional abnormalities (impaired vasodilation, impaired flow reserve)
      - Absence or poor quality of collateral vessels
      - Previous revascularization performed
      - Previous coronary artery thrombosis
      - Previous myocardial infarction
      - Presence of ventricular dysfunction

Chronic Phase

- Long-term management begins at the end of the acute illness, usually at 4 to 6 weeks after fever onset. Management is based on two pieces of data:
  - The dimensions of the largest aneurysm at any point during the disease
  - The dimensions of the largest current aneurysm
- Additional risk factors considered for imaging:
  - Greater length and distal location of aneurysms that increase the risk of flow stasis
  - Greater total number of aneurysms
  - Greater number of branches affected
  - Presence of luminal irregularities

Pediatric Cardiac Imaging Guidelines

- Abnormal characterization of the vessel wall (calcification, luminal myofibroblastic proliferation)
- Presence of functional abnormalities (impaired vasodilation, impaired flow reserve)
- Absence or poor quality of collateral vessels
- Previous revascularization performed
- Previous coronary artery thrombosis
- Previous myocardial infarction
- Presence of ventricular dysfunction
- Long term routine surveillance in asymptomatic imaging for Kawasaki disease-see chart

Kawasaki disease (KD) is an acute systemic vasculitis of childhood and remains a clinical diagnosis because no single diagnostic test is pathognomonic. Diagnosis is based on the presence of characteristic clinical features, supplemented by laboratory findings and echocardiography, particularly when presentation is incomplete. Early recognition is critical because timely treatment reduces the risk of coronary artery aneurysm formation. Current American Heart Association (AHA) and American College of Radiology (ACR) guidance define complete KD as fever for at least 5 days accompanied by at least four of five principal clinical features: (1) bilateral non-exudative conjunctival injection, (2) oral mucosal changes such as cracked lips, strawberry tongue, or oropharyngeal erythema, (3) polymorphous rash, (4) extremity changes including erythema or edema of the hands and feet or later periungual desquamation, and (5) cervical lymphadenopathy ≥1.5 cm, typically unilateral. Diagnosis may also be established with fewer days of fever when classic features are strongly present and clinical suspicion is high. Clinical manifestations often develop sequentially, making a thorough history essential.

The 2024 AHA Kawasaki Disease Scientific Statement further supports long-term imaging surveillance in patients with coronary artery aneurysms or persistent coronary abnormalities. Echocardiography remains first-line imaging, while CTA and CMR are increasingly used for assessment of stenosis, thrombosis, ischemia risk, and long-term coronary remodeling. Higher-risk patients with medium, large, or giant coronary aneurysms require substantially more intensive surveillance (Jone et al., 2024)..

Coding

Code	Description
71555	Magnetic resonance angiography, chest (excluding myocardium), with or without contrast material(s)

Code	Description
75557	Cardiac magnetic resonance imaging for morphology and function without contrast material;
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences;
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)
93306	Echocardiography, transthoracic, real-time with image documentation (2d), includes m-mode recording, when performed, complete, with Spectral doppler echocardiography, and with color flow doppler echocardiography
93454	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation
93458	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed

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CDP.CS.0006.A
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Pediatric Pulmonary Hypertension

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Pediatric Pulmonary Hypertension General (PEDCD-7.1)

CDP.CS.0007.1.A
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Criteria

The following imaging is considered medically necessary in the evaluation of pulmonary hypertension (PH):

- TTE for the initial evaluation of PH
- CT Chest and CTA Chest or CMR and MRA Chest for initial evaluation of PH
- Right and/or left heart catheterization on initial diagnosis of PH
- Repeat TTE is as follows:
  - every 4 to 6 months after initial evaluation
  - at any time for new or worsening symptoms
  - to evaluate a recent change in therapy
- CMR when TTE is inconclusive or suboptimal, or to monitor right ventricular function during follow-up
- Right heart and/or left heart catheterization is considered medically necessary before and after initiation of PH-targeted therapy, or for evaluation of individuals with concomitant congenital heart disease.

Coding

Code	Description
71250	Computed tomography, thorax, diagnostic; without contrast material
71275	Computed tomographic angiography, chest (noncoronary), with contrast material(s), including noncontrast images, if performed, and image postprocessing
71552	Magnetic resonance (eg, proton) imaging, chest (eg, for evaluation of hilar and mediastinal lymphadenopathy); without contrast material(s), followed by contrast material(s) and further sequences
71555	Magnetic resonance angiography, chest (excluding myocardium), with or without contrast material(s)
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences;

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Code	Description
93303	Transthoracic echocardiography for congenital cardiac anomalies; complete
93306	Echocardiography, transthoracic, real-time with image documentation (2d), includes m-mode recording, when performed, complete, with Spectral doppler echocardiography, and with color flow doppler echocardiography
+93320	Doppler echocardiography, pulsed wave and/or continuous wave with spectral display (List separately in addition to codes for echocardiographic imaging); complete
+93325	Doppler echocardiography color flow velocity mapping (List separately in addition to codes for echocardiography)

Background and Supporting Information

Pulmonary hypertension in children can be caused by cardiac, pulmonary, or systemic diseases, and idiopathic disease occurs as well.

Repeat echocardiography intervals are variable depending on age of individual, etiology, and severity. CT Chest is considered medically necessary for the initial evaluation of all pediatric individuals with pulmonary hypertension to evaluate for pulmonary vascular or interstitial disease, or other intrathoracic cause.

Evidence Discussion

Pulmonary vascular disease remains one of the most important determinants of morbidity in congenital left-to-right shunt lesions. Contemporary pediatric pulmonary hypertension guidance and congenital heart disease literature demonstrate that delayed repair of significant ASD, VSD, PDA, and AVSD lesions may lead to progressive pulmonary vascular remodeling and, ultimately, irreversible pulmonary hypertension or Eisenmenger physiology (Sachdeva et al., 2026).

Evidence consistently supports escalation of evaluation when right-to-left shunting develops, pulmonary artery pressures rise, or clinical findings suggest elevated pulmonary vascular resistance. Cardiac catheterization remains the reference standard for definitive characterization of pulmonary vascular disease and operability assessment. The recently published ACC guidance on pediatric left-to-right shunt lesions emphasizes consideration of more intensive follow-up in patients demonstrating evidence of pulmonary vascular involvement. (Sachdeva et al., 2026).

Current evidence supports CMR for reproducible assessment of RV remodeling and function, blood flow, ventricular interaction, longitudinal change, and selected prognostic

markers in pediatric PH. CT is supported for targeted evaluation of pulmonary vascular, venous, airway, and parenchymal abnormalities that may cause, characterize, or complicate PH. Neither modality replaces echocardiography for initial screening or cardiac catheterization for definitive hemodynamic diagnosis and treatment planning. Use should be individualized according to the clinical question, expected effect on management, need for sedation, and risks associated with ionizing radiation or contrast exposure. Although multiple sources support the clinical value of advanced imaging, pediatric prognostic thresholds remain incompletely validated and much of the evidence is derived from observational studies and expert consensus (Latus et al., 2016; Latus & Meierhofer, 2021; Miles et al., 2026).

Pediatric Cardiac Imaging Guidelines

References (PEDCD-7)

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Echocardiography

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Echocardiography General Indications

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Initial Transthoracic Echocardiography (TTE) Indications (PEDCD-8.2)

Criteria

- In addition to the criteria listed in previous guideline sections, initial TTE evaluation is considered medically necessary as follows:
  - Signs/symptoms suspected to be cardiac including (but not limited to) central cyanosis, dyspnea, edema, poor peripheral pulses, feeding difficulty, decreased urine output, hepatomegaly, or desaturation on pulse oximetry
  - Abnormal EKG or cardiac biomarkers
  - Abnormal chest x-ray suggesting cardiovascular disease
  - Documentation of any pathologic murmur
  - Any murmur with associated cardiac signs or symptoms
  - First-degree relative with any of the following before age 50:
    - Sudden cardiac arrest or death
    - Pacemaker or implantable defibrillator placement
    - First-degree relative with cardiomyopathy
  - Supraventricular Tachycardia (SVT), Ventricular Tachycardia, or Premature Ventricular Contractions (PVCs)
  - Known or suspected valvular dysfunction
  - Persistent systemic hypertension
  - Individuals with new onset hypertension
    - TTE indicated to assess for cardiac target organ damage (LV mass, geometry, and function) at the time of consideration of pharmacologic treatment of systemic hypertension
  - Obesity (BMI >30) with additional cardiovascular risk factors
  - Stroke
  - Renal failure
  - Preoperative evaluation of individuals with chest wall deformities or scoliosis
  - Known or suspected vascular ring
  - Planned administration of cardiotoxic chemotherapy
    - Generally anthracyclines (doxorubicin, daunorubicin, mitoxantrone, idarubicin, epirubicin)

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- Planned radiation therapy involving heart muscle or hematopoietic stem cell transplant
- Sickle cell disease or other hemoglobinopathy causing chronic anemia
- Known or suspected vasculitis, acute rheumatic fever, or other systemic autoimmune disease
- Aortopathy (e.g., Marfan, Ehlers-Danlos, Loeys-Dietz)
  - Positive personal diagnosis
  - First-degree relative
  - Positive gene
  - Finding suggestive of aortopathy such as x-ray showing aortic dilation
- Muscular dystrophy
  - Positive personal diagnosis
  - First-degree relative
  - Positive gene
  - Any findings suggestive of MD, such as neurological exam
- Cardiomyopathy
  - Diagnosed by other modality (e.g., CMR)
  - First-degree relative
  - Positive genetic testing
  - Findings suggestive of, such as cardiomegaly on x-ray
- Metabolic, mitochondrial, and storage disorders
  - Positive personal diagnosis
  - First-degree relative
  - Positive genetic testing
  - Findings suggestive of on exam or lab findings
- Abnormalities of cardiac or other viscera situs
- Signs, symptoms, or blood culture suggestive of endocarditis
- Known or suspected mass lesion involving the heart or great vessels
- Known or suspected clot in atrium or ventricle
- Known or suspected pulmonary hypertension
- Known or suspected pericardial effusion
- Complications during prenatal development:
  - Known or suspected cardiovascular abnormality on fetal echocardiogram
  - Maternal phenylketonuria (PKU)
  - Maternal diabetes with no fetal echo
  - Maternal teratogen exposure
  - Maternal infection during pregnancy with potential cardiac sequelae
- Genetic abnormality known to be associated with cardiovascular disease such as:
  - Down syndrome

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        - Turner syndrome
        - 22q11 deletion syndrome
        - Williams syndrome
        - Noonan syndrome
    - First-degree relative family history of:
        - Unexplained sudden death before age 50
        - Hypertrophic cardiomyopathy
        - Non-ischemic dilated cardiomyopathy
        - Genetic abnormality known to be associated with cardiovascular disease
        - Congenital left-sided heart lesion
        - Heritable pulmonary arterial hypertension

Coding considerations

- Providers performing an **initial** echocardiogram on a pediatric individual may not know what procedure codes they will be reporting until the initial study is completed.
    - If congenital heart disease is found on the initial echo, a complete echocardiogram is reported with codes CPT® 93303, CPT® 93320, and CPT® 93325 because CPT® 93303 does NOT include Doppler and color flow mapping.
    - If no congenital issue is discovered, then CPT® 93306 is reported alone and includes 2-D, Doppler and color flow mapping.
- Since providers may not know the appropriate code(s) that will be reported at the time of the study, they may request multiple codes.
    - The following echocardiography code combinations for any **initial** echocardiogram:
        - CPT® 93303, CPT® 93306, CPT® 93320, and CPT® 93325
        - CPT® 93303, CPT® 93306
        - CPT® 93306 CPT® 93320 and CPT® 93325 are included with CPT® 93306
    - Post-service audits may be completed to ensure proper claims submission.
- Correct coding for subsequent echocardiograms
    - If an individual is being followed for known congenital heart disease, and an echocardiogram is considered medically necessary, the appropriate codes are (CPT® 93303 or 93304) in addition to appropriate doppler codes (CPT® 93320 or 93321) and CPT® 93325.
    - If an individual has documented normal anatomy or acquired heart disease, and an echocardiogram is considered medically necessary, non-congenital codes are appropriate CPT® 93306 (includes all Doppler codes) or CPT® 93308 with CPT® 93321 and CPT® 93325.
    - For individuals with newborn physiology (e.g., ASD versus PFO, or PDA), the final echocardiogram that documents normal anatomy can be coded as congenital. However, any subsequent echocardiograms after that, which would be completed for a new indication, (e.g., shortness of breath) would be coded as non-congenital.

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Repeat Transthoracic Echocardiography Indications (PEDCD-8.3)

Criteria

In addition to criteria listed in previous guideline sections, repeat TTE is considered medically necessary as follows:

- In an individual with known cardiac disease and a previously normal echocardiogram when there is documentation of any of the following:
  - New or worsening cardiac symptoms
  - New EKG abnormality
  - Newly recognized family history suggestive of heritable heart disease
- In an individual with prior normal evaluation
  - New or worsening symptoms
  - New EKG finding
  - New murmur
  - New finding of inheritable disease in first-degree relative
- Individuals with first-degree family history of cardiomyopathy (e.g., hypertrophic, dilated, arrhythmogenic) or aortopathy
  - Repeat echocardiogram every 12 months
  - Repeat echocardiogram is considered medically necessary at the additional intervals when the family history or gene mutation is associated with neonatal or fetal disease:
    - At birth
    - Within the first 6 weeks
    - At 3 months
    - At 6 months
    - At one year
    - Then yearly
  - Repeat imaging is considered **not** medically necessary in individuals with first degree relative with known mutation when **both** of the following apply:
    - Individual has been tested and does not have that mutation.
    - Individual has a normal echocardiogram.
  - If there are abnormal findings on screening/surveillance imaging, a repeat echocardiogram is allowed to assess stability of findings.
- Individual with a phenotype positive cardiomyopathy (with or without a positive gene) can be imaged as follows:
  - Infants (under one year)
    - TTE is considered medically necessary at frequency requested by pediatric cardiology or provider in consultation with pediatric cardiology.

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    - Children (over one year) yearly testing is considered medically necessary as follows:
        - Repeat TTE every 12 months
        - Repeat TTE to assess stability at discretion of pediatric cardiology, or provider in consultation with pediatric cardiology, after any new or changed clinical finding
        - TTE at any time with documented new or changing symptoms
- Individual with a known mutation associated with cardiomyopathy or aortopathy and no previous abnormal imaging
    - Repeat echocardiogram every 12 months
        - In individuals whose gene mutation is associated with neonatal or fetal disease or there is a family history of neonatal or fetal disease, repeat echocardiogram is considered medically necessary at the following intervals:
            - At birth
            - Within the first 6 weeks
            - Then at 3 months
            - At 6 months
            - At one year
            - Then yearly
    - If there are abnormal findings on screening/surveillance imaging, a repeat echocardiogram is considered medically necessary to assess stability of findings.
- Individuals who are status post heart transplant can have echocardiograms repeated as often as requested by heart transplant team.
- Every 12 months for individuals receiving active therapy for ventricular hypertrophy, valvular dysfunction, cardiomyopathy
    - One time repeat TTE can be approved at 6 months to assess response to a change in therapy.
- Every 12 months for individuals with chronic pericardial effusions
- Every 12 months routine surveillance in asymptomatic individuals with muscular dystrophy (may be replaced by cardiac MRI CPT® 75557 or 75561 at 6 years of life)
- Every 12 months for sickle cell disease or other hemoglobinopathy causing chronic anemia and one of the following:
    - High-risk genotype (HbSS or HbSβ^0, severe thalassemia, etc.)
    - History of acute chest syndrome or intrinsic lung disease
    - History of stroke
    - Receiving chronic transfusion therapy
- As needed for monitoring cardiotoxicity during chemotherapy administration
- TTE follow-up for systemic hypertension

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- In individuals with evidence of end organ damage (includes LVH, or decreased LVEF) TTE is considered medically necessary every 6 months until echocardiogram normalizes.
- Individuals without LV target organ injury (no LVH, normal LVEF) at initial echocardiographic assessment, repeat echocardiography at yearly intervals is considered medically necessary in those with persistent hypertension (stage 2 HTN, or chronic stage 1 HTN incompletely treated (noncompliance or drug resistance).

Transthoracic Echocardiography (TTE) Coding

- CPT® codes for echocardiography are listed in **General Guidelines (PEDCD-1.0)**

Echocardiogram coding notes	CPT®
• The most commonly performed study is a complete transthoracic echocardiogram with spectral and color flow Doppler (CPT® 93306). ◦ CPT® 93306 includes CPT® 93320 and CPT® 93325, so those codes should not be approved along with CPT® 93306.	93306
• Doppler codes (CPT® 93320, CPT® 93321, and CPT® 93325) are add-on codes and are assigned in addition to code for the primary procedure, and should not be approved alone.	+93320 +93321 +93325
• For a 2D transthoracic echocardiogram without Doppler, report CPT® 93307.	93307
• A limited transthoracic echocardiogram is reported with CPT® 93308. ◦ Limited transthoracic echocardiogram should be billed if the report does not “evaluate or document the attempt to evaluate” all of the required structures. ◦ Unlike CPT® 93306, the Doppler CPT® 93321 and CPT® 93325 are not included with CPT® 93308. ◦ CPT® 93321 (not CPT® 93320) should be reported with CPT® 93308 if Doppler is included in the study. ◦ CPT® 93325 should also be reported with CPT® 93308 if color flow Doppler is included in the study.	93308
• For individuals with known congenital heart disease, a limited transthoracic echocardiogram is reported with CPT® 93304, +/- CPT® 93321 and CPT® 93325.	93304

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Transesophageal Echocardiography (TEE) (PEDCD-8.4)

Criteria

TEE (CPT® 93312, 93320, and 93325) is considered medically necessary when there is documentation of **any** of the following:

- limited transthoracic echo window when further information is needed to guide management (e.g., suspected or confirmed endocarditis, suspected intracardiac mass, etc.)
- assessing valvular dysfunction, especially mitral regurgitation when TTE is inadequate and intervention is being considered to repair/replace valve
- evaluation of cardiac mass, suspected tumor, or thrombus
- pre-procedural assessment of PFO/ASD
- pre-operative evaluation prior to planned LVAD implant
- embolic source or intracardiac shunting when TTE is inconclusive
  - Examples: atrial septal defect, ventricular septal defect, patent foramen ovale, aortic cholesterol plaques, thrombus in cardiac chambers, valve vegetation, tumor
- embolic events when there is an abnormal TTE or a history of atrial fibrillation
  - clarify atria/atrial appendage, aorta, mitral/aortic valve beyond the information that other imaging studies have provided
- cardiac valve dysfunction
  - differentiation of tricuspid from bicuspid aortic valve in setting of aortic enlargement or significant stenosis or significant regurgitation
  - congenital abnormalities
- assessing for left atrial thrombus prior to cardioversion of atrial fibrillation or atrial flutter
- assessing for left atrial thrombus prior to planned atrial fibrillation ablation/pulmonary vein isolation procedure
- for initial imaging of ascending and descending thoracic aortic aneurysms
- For repeat imaging of established thoracic aneurysms, TEE is medically necessary **only** when imaging with CT or MR is contraindicated.
- TEE is medically necessary for the evaluation of individuals with hypertrophic cardiomyopathy if TTE is inconclusive for **any** of the following:
  - mitral regurgitation secondary to structural abnormalities of the mitral valve
  - subaortic membrane or aortic valve stenosis
- pre-procedure planning for surgical myectomy or alcohol septal ablation
- Left atrial appendage (LAA) Closure device for any of the following:
  - pre-procedural evaluation
  - repeat imaging 45 days post-procedure

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- Another follow-up study is medically necessary before the 1-year surveillance when the imaging study at 45 days shows a peri-device gap ≥5 mm or Device Related Thrombus usually at 3-6 months.

- 1 year post-procedure

Pediatric Cardiac Imaging Guidelines

References (PEDCD-8)

CDP.000.8.1.A
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Magnetic Resonance Imaging

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MR Imaging (PEDCD-9)

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Indications for Cardiac MRI (CMR) (PEDCD-9.3)

Criteria

- In addition to the criteria listed in previous guideline sections, CMR (CPT® 75557 or 75561) is considered medically necessary when a recent TTE is inconclusive or suboptimal as follows:
  - Assess global ventricular function and mass when results are needed for treatment planning
  - in complex congenital heart disease (i.e., TOF, single ventricle, truncus arteriosus, TGA) to evaluate structures, function, or residual lesions for baseline surveillance planning or during establishment of adult congenital heart disease care. Once these individuals reach age 19, they can be imaged by adult congenital heart disease guideline
  - further evaluate clinical suspicion of arrhythmogenic right ventricular dysplasia (ARVD) or arrhythmogenic cardiomyopathy (ARVC)
  - in pericardial disease (including constrictive pericarditis, restrictive pericarditis, and perimyocarditis),to further evaluate possible constriction or restriction
    - MRI without and with contrast (CPT® 75561)
  - evaluate cardiac tumor or mass
    - MRI without and with contrast (CPT® 75561)
  - evaluate anomalous coronary artery
    - MRI without and with contrast (CPT® 75561) or CCTA (CPT® 75574)
  - in Fabry disease to assess the effect of enzyme replacement therapy
    - MRI without and with contrast (CPT® 75561)
  - to characterize the myocardium (CPT® 75557 or 75561) in congenital cardiomyopathy (muscular dystrophy, glycogen storage disease, fatty acid oxidation disorders, mitochondrial disorders, etc.) or unexplained cardiomyopathy
- Stress-perfusion CMRCardiac stress perfusion study (CPT® 75559 or CPT® 75563) is considered medically necessary when there is a concern for ischemia as follows:
  - assess the functional relevance of anomalous coronary artery
  - Kawasaki disease with coronary artery aneurysms
  - TGA after arterial switch
  - Ross procedure

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  - when an exercise stress test (EST) without imaging is considered medically necessary but the individual is not able to perform an EST
  - when an EST is equivocal, positive, or there is concern for a false negative
- Assessment of cardiac iron overload such as in hemochromatosis, thalassemia, sickle cell (either CPT® 75557 or CPT® 71550, T2* MRI, contrast not necessary)
  - Screening imaging is considered medically necessary every 12 months.
  - Imaging is considered medically necessary every 3 months for treatment response in individuals receiving active treatment (chelation +/- phlebotomy).
  - Frequently performed along with MRI Abdomen (CPT® 74181) to assess liver iron deposition (see **Transfusion-associated (Secondary) Hemochromatosis (PEDAB-18.2)** in the Pediatric Abdomen Imaging Guidelines)
- Asymptomatic individuals with Duchenne Muscular Dystrophy (DMD)
  - MRI Cardiac is considered medically necessary for surveillance in place of TTE every year starting at 6 years of age.
  - Female carriers should be imaged according to general Cardiac Imaging Guidelines.
  - CPT® 75565 or CPT® 71555 are considered **not** medically necessary for asymptomatic surveillance of DMD.

Myocarditis

CMR is considered medically necessary for evaluation of pediatric myocarditis as follows:

- when there is documented clinical suspicion for myocarditis (i.e., abnormal biomarkers, ECG findings, arrhythmia, ventricular dysfunction, persistent symptoms)
- TTE is abnormal or inconclusive.
- Additional tissue characterization is needed for treatment planning.

MRA Chest for Congenital Heart Disease (PEDCD-9.4)

Criteria

- For Familial Aortopathies, see **Thoracic Aortic Disease (PEDPVD-4.1)** in the Pediatric Peripheral Vascular Disease Imaging Guidelines.
- For individuals with known CHD for routine imaging, see **Imaging and Surveillance per Congenital lesion (PEDCD-2.4)**.
- For individuals who have both cardiac and ascending aorta abnormalities (e.g., truncus arteriosus), the following studies are considered medically necessary following an inconclusive TTE:
  - Cardiac MRI (CPT® 75557 or CPT® 75561)
  - And MRI Chest (CPT® 71552) or MRA Chest (CPT® 71555) if aorta is involved

- For individuals with aortic abnormalities without cardiac abnormalities (i.e. normal intracardiac anatomy, but coarctation or peripheral pulmonary artery stenosis), the following studies are considered medically necessary following an inconclusive TTE:
  - MRI Chest (CPT® 71552)
  - MRA Chest (CPT® 71555)
- MRA Chest (CPT® 71555) is considered medically necessary for individuals with cardiomyopathy or isolated abnormal intracardiac anatomy, when there are inconclusive images on echocardiogram related to chest vessels (e.g. aortic arch, pulmonary arteries, pulmonary veins, systemic veins).

Evidence Discussion

The peer-reviewed published literature and recent professional guidance support cardiac magnetic resonance imaging (CMR) as an important noninvasive adjunct in the evaluation of pediatric patients with suspected or known myocarditis when clinical findings, biomarkers, electrocardiography, or echocardiography suggest myocardial involvement. The 2024 American College of Cardiology (ACC) Expert Consensus Decision Pathway, published in Journal of the American College of Cardiology in 2025, states that CMR provides valuable diagnostic information in myocarditis by characterizing myocardial edema, hyperemia, necrosis, fibrosis, pericardial inflammation, and left ventricular dysfunction (Drazner et al., 2025).

Pediatric-focused evidence also supports CMR as a key modality for myocardial tissue characterization. A 2023 systematic review and meta-analysis of quantitative CMR parameters in children and adolescents with myocarditis found that native myocardial T1 mapping was significantly higher in pediatric myocarditis compared with healthy controls, supporting the diagnostic value of CMR mapping techniques in this population (Yao et al., 2023). However, the review also reported less consistent differences for some other parameters, including early gadolinium enhancement ratio, T2-weighted ratio, and T2 mapping, indicating that CMR findings should be interpreted in the context of the full clinical picture and that diagnostic performance may vary by technique, disease timing, and study methodology (Yao et al., 2023).

Recent society guidance further strengthens the policy rationale for CMR in selected pediatric patients. The 2025 European Society of Cardiology (ESC) Guidelines for the management of myocarditis and pericarditis, endorsed by the Association for European Paediatric and Congenital Cardiology, present a structured diagnostic framework for inflammatory myocardial and pericardial syndromes and refine the role of multimodality imaging, including CMR, in diagnosis and management (Schulz-Menger et al., 2025).

Cardiac MRI Coding (PEDCD-9.2)

Code	Description
	CMR
75557	Cardiac magnetic resonance imaging for morphology and function without contrast material;
75559	Cardiac magnetic resonance imaging for morphology and function without contrast material; with stress imaging
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences;
75563	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences; with stress imaging
+75565	Cardiac magnetic resonance imaging for velocity flow mapping (list separately in addition to code for primary procedure)
	MRI Chest
71550	Magnetic resonance (eg, proton) imaging, chest (eg, for evaluation of hilar and mediastinal lymphadenopathy); without contrast material(s)
71552	Magnetic resonance (eg, proton) imaging, chest (eg, for evaluation of hilar and mediastinal lymphadenopathy); without contrast material(s), followed by contrast material(s) and further sequences
71555	Magnetic resonance angiography, chest (excluding myocardium), with or without contrast material(s)

- Only one procedure code from the set: CPT® 75557, CPT® 75559, CPT® 75561, and CPT® 75563 should be reported per session.
- Only one flow velocity measurement (CPT® +75565) should be reported per session.

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Pericardial Effusion or Pericardial Tamponade

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Evaluation of Pericardial Effusion or Diagnosis of Pericardial Tamponade (PEDCD-9.5)..... 116
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Evaluation of Pericardial Effusion or Diagnosis of Pericardial Tamponade (PEDCD-9.5)

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Criteria

- TTE is considered medically necessary to evaluate pericardial effusions or diagnose pericardial tamponade.
- Contrast-enhanced CMR is considered medically necessary when results will effect clinical management to evaluate any of the following conditions:
  - Pericarditis
  - Neoplastic effusion (e.g., metastatic cancer to the pericardium or myocardium including lung, breast, renal cell, lymphoma and melanoma)
  - Tamponade
  - Myocardial infiltration
  - to answer a clinical question left unanswered by another recent imaging study

Evidence Discussion

Evidence supports the use of transthoracic echocardiography as the initial imaging study for evaluation of suspected pericardial effusion and cardiac tamponade because it rapidly identifies pericardial fluid, assesses ventricular function, and evaluates hemodynamic compromise (Schulz-Menger et al, 2025). The evidence also supports the use of contrast-enhanced cardiac MRI when a specific clinical question remains unanswered by recent imaging and the results are expected to affect management. In this setting, CMR is useful for the evaluation of pericarditis, cardiac tamponade with associated pericardial pathology, myocardial infiltration, and neoplastic involvement of the pericardium or myocardium, including malignant effusions associated with lung, breast, renal cell, lymphoma, and melanoma malignancies (Schulz-Menger et al., 2025)

Coding

Code	Description
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences;

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Code	Description
93306	Echocardiography, transthoracic, real-time with image documentation (2d), includes m-mode recording, when performed, complete, with Spectral doppler echocardiography, and with color flow doppler echocardiography

Pediatric Cardiac Imaging Guidelines

References (PEDCD-9.5)

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Computed Tomography

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Cardiac Indications for CT (PEDCD-10)

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CCTA Criteria (PEDCD-10.3)

Criteria

CPT® 75574

- In addition to the criteria listed in previous guideline sections, CCTA is considered medically necessary for any of the following, when a recent TTE and/or MRI is inconclusive:
  - Persistent exertional chest pain and normal stress test
  - Full sibling(s) with history of sudden death syndrome before age 30 or with documented anomalous coronary artery
  - Resuscitated sudden death and contraindication to conventional coronary angiography
  - Unexplained new onset of heart failure if CCTA will replace conventional invasive coronary angiography
  - Documented ventricular tachycardia (6 beat runs or greater) if CCTA will replace conventional invasive coronary angiography
  - Equivocal coronary artery anatomy on conventional cardiac catheterization
  - In infants: otherwise unexplained dyspnea, tachypnea, wheezing, episodic pallor, irritability, sweating, poor feeding, and/or failure to thrive
    - The presence of other congenital heart disease is not a separate indication for CCTA to rule out anomalous coronary artery (except when coronary artery surgery is pending, i.e., Transposition of the great arteries, Tetralogy of Fallot, Truncus arteriosus, aortic root surgery)
  - Evaluation of the arterial supply and venous drainage in children with bronchopulmonary sequestration

Cardiac CT Structure and Morphology (PEDCD-10.4)

Criteria

CPT® 75572

- In addition to the criteria listed in previous guideline sections, CCT is considered medically necessary for any of the following, when a recent TTE and/or MRI is inconclusive:

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- Cardiac or pericardial mass
- Pericarditis
- Complications of cardiac surgery or evaluation of post-operative anatomy
- Cardiac thrombus in individuals with technically limited TTE, TEE, or CMR
- Clinical suspicion of arrhythmogenic right ventricular dysplasia (ARVD) or arrhythmogenic cardiomyopathy (ARVC)
- Native aortic abnormalities if echocardiogram is indeterminate
- Intracardiac anatomy unclear after TTE or CMR
- A CTA Chest is considered medically necessary during a Cardiac CT if there are issues regarding the chest vessels that are inconclusive after echocardiogram or CMR

CTA Chest with CT Cardiac (CCT) or CTA Cardiac (CCTA) (PEDCD-10.5)

Criteria

CPT® 71275

- CTA Chest is considered medically necessary in individuals who require CCT or CCTA when:
  - A TTE or MRI is inconclusive for issues regarding chest vasculature
  - Routine imaging is considered medically necessary based on **Imaging and Surveillance per Congenital lesion (PEDCD-2.4)**

Evidence Discussion

Evidence supports cardiac computed tomography (CCT), including cardiac CT angiography, for defining complex cardiovascular anatomy, coronary artery abnormalities, extracardiac vascular structures, and postoperative complications in children with congenital or acquired heart disease, although evidence remains limited for demonstrating improved long-term clinical outcomes compared with other imaging modalities. Contemporary reviews and scientific statements indicate that CCT provides rapid image acquisition and high spatial resolution at the elevated heart rates commonly encountered in children and may reduce the need for sedation or anesthesia compared with cardiovascular magnetic resonance (CMR). These advantages are particularly relevant when echocardiographic findings are incomplete, CMR is contraindicated or nondiagnostic, or detailed evaluation of the coronary arteries, systemic or pulmonary veins, great vessels, conduits, shunts, or surgically altered anatomy is required (Kulkarni et al., 2016; Sachdeva et al., 2024; Secinaro et al., 2019).

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Evidence also supports use of Cardiac CT for selected pediatric patients with congenital or acquired heart disease, particularly when detailed coronary or extracardiac vascular anatomy is needed, echocardiography is incomplete, CMR is contraindicated or likely to require sedation, or rapid imaging is clinically important. The evidence is stronger for diagnostic accuracy, anatomic delineation, and procedural planning than for longitudinal surveillance, routine ventricular functional assessment, or improvement in long-term health outcomes. Use of CT should include a specific clinical indication, consideration of echocardiography and CMR, pediatric dose optimization, and use of the lowest radiation exposure capable of producing diagnostic image quality. The cumulative radiation burden and risks associated with iodinated contrast should be weighed against the expected diagnostic and management benefits for each patient (Hill et al., 2017; Krishnamurthy et al., 2023; Sachdeva et al., 2024)

Guideline and consensus statements from the American College of Radiology, Image Gently Alliance, and Society of Cardiovascular Computed Tomography recognize CCT as an appropriate complementary modality for selected congenital and acquired pediatric heart conditions. These recommendations emphasize that each examination should address a defined clinical question, be expected to provide information that cannot be obtained adequately through a lower-risk modality, and have a reasonable likelihood of affecting clinical management. Echocardiography generally remains the first-line examination, while CMR is preferred when comprehensive ventricular function, blood flow, perfusion, or tissue characterization is required and can be obtained safely and effectively (Fogel et al., 2022; Han et al., 2015; Hill et al., 2017; Krishnamurthy et al., 2023).

Coding

Codes	Description
71275	Computed tomographic angiography, chest (noncoronary), with contrast material(s), including noncontrast images, if performed, and image postprocessing
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)
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)

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Diagnostic Heart Catheterization

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Cardiac Catheterization Additional Criteria (PEDCD-11.2)

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Criteria

In addition to the condition specific sections in this guideline, diagnostic heart catheterization is considered medically necessary for any of the following conditions:

- Other advanced imaging has failed to resolve a clinical issue and results will impact clinical management (e.g., a catheterization to assess ventricular pressures and shunt to determine if VSD surgery is required).
- Preoperative assessment in complex heart disease including:
  - Norwood procedure
  - Bidirectional Glenn shunt
  - Fontan procedure
  - Pulmonary atresia
- Pulmonary hypertension
- During some interventions such as:
  - Valvuloplasty
  - Pulmonary artery or vein stents
- Post heart transplant assessment
- On an individual who is having a device placed when:
  - A diagnostic catheterization or stenting is needed in addition to the device
  - The diagnostic catheterization is considered medically necessary separate from the device placement.
- Individuals with anomalous coronary arteries, or with syndromes associated with abnormal coronary arteries (i.e., Williams syndrome) or acquired CAD
  - When diagnostic images are not adequate or evaluation or treatment decision
  - Preoperative for cardiac surgery
  - New symptoms concerning for ischemia

Special Considerations

- These guidelines apply to individuals with stable conditions and who are not in the acute setting. Individuals in acute settings or with unstable angina should be handled as medical emergencies.
- When device placement is planned (ASD/VSD device, transcatheter valve implantation, PDA device), the procedure codes for those devices include all

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cardiac catheterization(s), intraprocedural contrast injection(s), fluoroscopic radiological supervision and interpretation, and imaging guidance performed to complete the procedure. A diagnostic catheterization may be considered on a case-by-case basis if there are unanswered issues via noninvasive imaging.

- A right heart catheterization is considered medically necessary for pulmonary artery interventions (e.g., stents, coils).

Coding

Cardiac Catheterization Procedure Codes

Codes	Cardiac Catheterization Procedures
93451-93464 93566-93568	Anomalous coronary arteries, patent foramen ovale, mitral valve prolapse, and bicuspid aortic valve
RHC without LHC or coronaries	
93451	Right Heart Catheterization Including Measurement(S) Of Oxygen Saturation And Cardiac Output, When Performed
LHC without RHC or coronaries	
93452	Left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
RHC and retrograde LHC without coronaries	
93453	Combined right and left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
Native coronary artery catheterization	
93454	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation
bypass grafts	

Codes	Cardiac Catheterization Procedures
93455	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial venous grafts) including intraprocedural injection(s) for bypass graft angiography
RHC	
93456	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right heart catheterization
RHC and bypass grafts	
93457	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography and right heart catheterization
LHC	
93458	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed
LHC and bypass grafts	
93459	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography
RHC and LHC	

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Codes	Cardiac Catheterization Procedures
93460	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed
RHC and LHC and bypass grafts	
93461	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography
93593-93597	**Congenital Heart Disease Code "Set"**
Codes 93593 to 93597 for invasive evaluation of congenital heart disease	
93593	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; normal native connections
93594	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; abnormal native connections
93595	Left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone, normal or abnormal native connections
93596	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); normal native connections
93597	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); abnormal native connections

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Multisystem Inflammatory Syndrome in Children (MIS-C)

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Multisystem Inflammatory Syndrome in Children (MIS-C) (PEDCD-12)

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MIS-C Indications for Cardiac Imaging (PEDCD-12.2)

Criteria

TTE is considered medically necessary to evaluate MIS-C at the time of presentation and for any of the following:

- there is a concern for new or recurrent MIS-C
- treatment planning or changes in medication (i.e., treatment with intravenous immunoglobulin [IVIg])
- new or changed cardiac symptoms or clinical findings

Serial TTE are considered medically necessary based on the ordering cardiologist's discretion when there is documented cardiac dysfunction.

CMR is considered medically necessary for MIS-C when TTE is inconclusive or suboptimal.

CCTA is considered medically necessary for MIS-C when coronary arteries are not completely visualized.

Cardiac catheterization or CCTA or MRA Chest is considered medically necessary in a symptomatic individual when imaging studies are positive, inconclusive, or otherwise lead to a conclusion that intervention is needed.

Imaging stress test (SPECT MPI, PET MPI, Echo stress, MRI stress) is considered medically necessary when there are new or progressing symptoms of ischemia or ventricular dysfunction.

MIS-C Repeat Cardiac Imaging (PEDCD-12.2.2)

TTE is considered medically necessary after discharge from the hospital for MIS-C with stable findings as follows:

- Within 1 week of discharge
- 4 weeks post-discharge
- 6 months post-discharge
- One year post-discharge

CMR is considered medically necessary for MIS-C as follows:

- when TTE is inconclusive or suboptimal; **or**

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- two to six months after diagnosis of an individual with evidence of cardiac involvement (e.g., symptoms, ECG abnormalities, abnormal cardiac biomarkers, or echocardiographic findings) as a one-time follow-up study

Individuals with dilated coronary arteries can have imaging based on the AHA Kawasaki guidelines as follows:

AHA risk level	Largest Aneurysm At Any Point	Largest Current Aneurysm	Routine Echo	Routine Stress Imaging	Routine Coronary Imaging
All			All risk levels 4-6 weeks after acute illness		
1	Normal	Normal	One echo 2-12 months after acute illness	none	none
2	Dilation	Dilation	6 months One year If dilation remains echo every 2-5 years until resolves	none	none
		Normal	After acute illness: 2-12 months One echocardiogram at one year No echocardiogram after one year		
3.1	Small	Small	6 months 12 months then yearly	3 to 5 years	CCTA at 1 year then every 3-5 years

Pediatric Cardiac Imaging Guidelines

AHA risk level	Largest Aneurysm At Any Point	Largest Current Aneurysm	Routine Echo	Routine Stress Imaging	Routine Coronary Imaging
3.2	Small	Normal or dilated	12 months Then every 5 years	3-5 years	CCTA at 1 year then with inducible ischemia on stress imaging
4.1	Medium	Medium	3 months 6 months 12 months Every 6-12 months after that	2 to 5 years	CCTA at 1 year then every 2-5 years
4.2	Medium	Small	6 months and 12 months, every 1 year	3 to 5 years	CCTA at 1 year then every 3-5 years
4.3	Medium	Normal Or Dilated	6 months and 12 months then every 2 years	4 to 5 years	6 months and 12 months then if inducible ischemia on stress imaging

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AHA risk level	Largest Aneurysm At Any Point	Largest Current Aneurysm	Routine Echo	Routine Stress Imaging	Routine Coronary Imaging
5.1	Large	Large	1 month 3 months 6 months 9 months 12 months Then every 6 to 12 months	6-12 months	CCTA or cardiac catheteriza-tion at 2-6 months then every 1-5 years
5.2	Large	Medium	3 months 6 months 9 months 12 months Then every 6-12 months	2 to 5 years	CCTA at 1 year then every 2-5 years
5.3	Large	Small	3 months 6 months 9 months 12 months Every 12 months	2 to 5 years	CCTA at 1 year then every 2-5 years
5.4	Large	Normal Or Dilation	3 months 6 months 9 months 12 months Every 1-2 years	3-5 years	CCTA at 1 year then every 3-5 years

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Evidence Discussion

The peer-reviewed published literature indicates that cardiac involvement is common in children with Multisystem Inflammatory Syndrome in Children (MIS-C), with reported manifestations including ventricular dysfunction, myocarditis-like injury, coronary artery dilation or aneurysm formation, pericardial effusion, valvular regurgitation, arrhythmias, and cardiogenic shock. Early multicenter observational studies and systematic reviews evaluating hundreds to thousands of affected children demonstrated that echocardiographic abnormalities are frequently present during the acute phase and may evolve rapidly during hospitalization (Son et al., 2021; Sperotto et al., 2021). As a result, transthoracic echocardiography (TTE) has become the primary imaging modality for initial and serial cardiac assessment. Available evidence supports repeat echocardiography when treatment decisions may be affected, when ventricular function is abnormal, when coronary artery abnormalities are identified, or when clinical status changes. While many cardiac abnormalities improve over weeks to months, persistent ventricular dysfunction, coronary involvement, and myocardial injury have been reported in a subset of patients, supporting continued surveillance after discharge (Sperotto et al., 2021).

The existing evidence also supports the selective use of advanced cardiac imaging when echocardiographic findings are incomplete or when additional characterization may affect management. Cardiac magnetic resonance imaging (CMR) provides detailed assessment of ventricular function and may assist in evaluation of suspected myocarditis or persistent cardiac abnormalities. Published evidence describes MIS-C as a post-infectious inflammatory syndrome with frequent cardiovascular involvement, including myocarditis-like injury, ventricular dysfunction, coronary artery abnormalities, pericardial effusion, and conduction abnormalities (McMurray et al., 2020; Valverde et al., 2021). Coronary CT angiography (CCTA) is supported when echocardiographic visualization of the coronary arteries is incomplete, particularly because coronary dilation or aneurysm formation may occur in MIS-C and is often managed using Kawasaki disease coronary artery risk frameworks (McCrindle et al., 2017; Jone et al., 2024)

Professional society and consensus-based guidance supports serial cardiac surveillance following MIS-C, with imaging frequency guided by ventricular function, coronary artery findings, symptoms, recurrence, medication changes, and clinical recovery. The American College of Rheumatology clinical guidance for MIS-C provides consensus-based recommendations for evaluation and management of children with MIS-C and hyperinflammation associated with SARS-CoV-2, including multidisciplinary management and cardiac assessment when clinically indicated (Henderson et al., 2022).

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Codes

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Pediatric Cardiac Imaging Guidelines

Codes

Codes associated with pediatric cardiology

CPT®	MRI/MRA
75557	Cardiac magnetic resonance imaging for morphology and function without contrast material
75559	Cardiac magnetic resonance imaging for morphology and function without contrast material; with stress imaging
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences
75563	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences; with stress imaging
75565	Cardiac magnetic resonance imaging for velocity flow mapping (List separately in addition to code for primary procedure)

CPT®	CT
75571	Computed tomography, heart, without contrast material, with quantitative evaluation of coronary calcium
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 LV cardiac function, RV structure and function and evaluation of venous structures, if performed)

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CPT®	CTA
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
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)
75635	Computed tomographic angiography, abdominal aorta and bilateral iliofemoral lower extremity runoff, with contrast material(s), including noncontrast images, if performed, and image postprocessing

CPT®	Nuclear Medicine
78414	Determination of central c-v hemodynamics (non-imaging) (e.g., ejection fraction with probe technique) with or without pharmacologic intervention or exercise, single or multiple determinations
78428	Cardiac shunt detection
78429	Myocardial imaging, positron emission tomography (PET), metabolic evaluation study (including ventricular wall motion[s] and/or ejection fraction[s], when performed), single study; with concurrently acquired computed tomography transmission scan
78430	Myocardial imaging, positron emission tomography (PET), perfusion study (including ventricular wall motion[s] and/or ejection fraction[s], when performed); single study, at rest or stress (exercise or pharmacologic), with concurrently acquired computed tomography transmission scan
78431	Myocardial imaging, positron emission tomography (PET), perfusion study (including ventricular wall motion[s] and/or ejection fraction[s], when performed); multiple studies at rest and stress (exercise or pharmacologic), with concurrently acquired computed tomography transmission scan

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CPT®	Nuclear Medicine
78432	Myocardial imaging, positron emission tomography (PET), combined perfusion with metabolic evaluation study (including ventricular wall motion[s] and/or ejection fraction[s], when performed), dual radiotracer (e.g., myocardial viability);
78433	Myocardial imaging, positron emission tomography (PET), combined perfusion with metabolic evaluation study (including ventricular wall motion[s] and/or ejection fraction[s], when performed), dual radiotracer (e.g., myocardial viability); with concurrently acquired computed tomography transmission scan
78434	Absolute quantitation of myocardial blood flow (AQMBF), positron emission tomography (PET), rest and pharmacologic stress (List separately in addition to code for primary procedure)
78451	Myocardial perfusion imaging, tomographic (SPECT) (including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); single study, at rest or stress (exercise or pharmacologic)
78452	Myocardial perfusion imaging, tomographic (SPECT) (including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); multiple studies, at rest and/or stress (exercise or pharmacologic) and/or redistribution and/or rest reinjection
78453	Myocardial perfusion imaging, planar (including qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); single study, at rest or stress (exercise or pharmacologic)
78454	Myocardial perfusion imaging, planar (including qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); multiple studies, at rest and/or stress (exercise or pharmacologic) and/or redistribution and/or rest reinjection
78459	Myocardial imaging, positron emission tomography (PET), metabolic evaluation study (including ventricular wall motion and/or ejection fraction, when performed), single study

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CPT®	Nuclear Medicine
78466	Myocardial imaging, infarct avid, planar; qualitative or quantitative
78468	Myocardial imaging, infarct avid, planar; with ejection fraction by first pass technique
78469	Myocardial imaging, infarct avid, planar; tomographic SPECT with or without quantification
78472	Cardiac blood pool imaging, gated equilibrium; planar, single study at rest or stress (exercise and/or pharmacologic), wall motion study plus ejection fraction, with or without additional quantitative processing
78473	Cardiac blood pool imaging, gated equilibrium; multiple studies, wall motion study plus ejection fraction, at rest and stress (exercise and/or pharmacologic), with or without additional quantification
78481	Cardiac blood pool imaging (planar), first pass technique; single study, at rest or with stress (exercise and/or pharmacologic), wall motion study plus ejection fraction, with or without quantification
78483	Cardiac blood pool imaging (planar), first pass technique; multiple studies, at rest and with stress (exercise and/or pharmacologic), wall motion study plus ejection fraction, with or without quantification
78491	Myocardial imaging, positron emission tomography (PET), perfusion (including ventricular wall motion and/or ejection fraction, when performed); single study at rest or stress (exercise or pharmacologic)
78492	Myocardial imaging, positron emission tomography (PET), perfusion (including ventricular wall motion and/or ejection fraction, when performed); multiple studies at rest and/or stress (exercise or pharmacologic)
78494	Cardiac blood pool imaging, gated equilibrium, SPECT, at rest, wall motion study plus ejection fraction, with or without quantitative processing

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CPT®	Nuclear Medicine
78496	Cardiac blood pool imaging, gated equilibrium, single study, at rest, with right ventricular ejection fraction by first pass technique (List separately in addition to code for primary procedure)
78597	Quantitative differential pulmonary perfusion, including imaging when performed
78598	Quantitative differential pulmonary perfusion and ventilation (e.g., aerosol or gas), including imaging when performed
78800	Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, single area (e.g., head, neck, chest, pelvis), single day imaging
78801	Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, 2 or more areas (e.g., abdomen and pelvis, head and chest), 1 or more days imaging or single area imaging over 2 or more days
78802	Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, whole body, single day imaging
78803	Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT), single area (e.g., head, neck, chest, pelvis), single day imaging
78804	Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, whole body, requiring 2 or more days imaging

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CPT®	Nuclear Medicine
78830	Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT) with concurrently acquired computed tomography (CT) transmission scan for anatomical review, localization and determination/detection of pathology, single area (e.g., head, neck, chest, pelvis), single day imaging
0331T	Myocardial sympathetic innervation imaging, planar qualitative and quantitative assessment
0332T	Myocardial sympathetic innervation imaging, planar qualitative and quantitative assessment; with tomographic SPECT

CPT®	Ultrasound
93303	Transthoracic echocardiography for congenital cardiac anomalies; complete
93304	Transthoracic echocardiography for congenital cardiac anomalies; follow-up or limited study
93306	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, complete, with spectral Doppler echocardiography, and with color flow Doppler echocardiography
93307	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, complete, without spectral or color Doppler echocardiography
93308	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, follow-up or limited study
93312	Echocardiography, transesophageal, real-time with image documentation (2D) (with or without M-mode recording); including probe placement, image acquisition, interpretation and report

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CPT®	Ultrasound
93313	Echocardiography, transesophageal, real-time with image documentation (2D) (with or without M-mode recording); placement of transesophageal probe only
93314	Echocardiography, transesophageal, real-time with image documentation (2D) (with or without M-mode recording); image acquisition, interpretation and report only
93315	Transesophageal echocardiography for congenital cardiac anomalies; including probe placement, image acquisition, interpretation and report
93316	Transesophageal echocardiography (TEE) for congenital cardiac anomalies; placement of transesophageal probe only
93317	Transesophageal echocardiography for congenital cardiac anomalies; placement of transesophageal probe only
+93319	3D echocardiographic imaging and postprocessing during transesophageal echocardiography, or during transthoracic echocardiography for congenital cardiac anomalies, for the assessment of cardiac structure(s) (e.g., cardiac chambers and valves, left atrial appendage, interatrial septum, interventricular septum) and function, when performed (List separately in addition to code for echocardiographic imaging) Code with (93303-93304, 93312, 93314, 93315, 93317, 93350-93351)
+93320	Doppler echocardiography, pulsed wave and/or continuous wave with spectral display (List separately in addition to codes for echocardiographic imaging); complete
+93321	Doppler echocardiography, pulsed wave and/or continuous wave with spectral display (List separately in addition to codes for echocardiographic imaging); follow-up or limited study (List separately in addition to codes for echocardiographic imaging)
+93325	Doppler echocardiography color flow velocity mapping (List separately in addition to codes for echocardiography)

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CPT®	Ultrasound
93350	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report;
93351	Echocardiography, transthoracic, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report; including performance of continuous electrocardiographic monitoring, with supervision by a physician or other qualified health care professional
+93352	Use of echocardiographic contrast agent during stress echocardiography (List separately in addition to code for primary procedure)
+93356	Myocardial strain imaging using speckle tracking-derived assessment of myocardial mechanics (List separately in addition to codes for echocardiography imaging)
C8921	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, for congenital cardiac anomalies; complete
C8922	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, for congenital cardiac anomalies; follow-up or limited study
C8923	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, real-time with image documentation (2D), includes M-mode recording, when performed, complete, without spectral or color doppler echocardiography
C8924	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, real-time with image documentation (2D), includes M-mode recording when performed, follow-up or limited study
C8925	Transesophageal echocardiography (TEE) with contrast, or without contrast followed by with contrast, real time with image documentation (2D) (with or without M-mode recording); including probe placement, image acquisition, interpretation and report

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CPT®	Ultrasound
C8926	Transesophageal echocardiography (TEE) with contrast, or without contrast followed by with contrast, for congenital cardiac anomalies; including probe placement, image acquisition, interpretation and report
C8928	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report
C8929	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, real-time with image documentation (2D), includes M-mode recording, when performed, complete, with spectral doppler echocardiography, and with color flow doppler echocardiography
C8930	Transthoracic echocardiography, with contrast, or without contrast followed by with contrast, real-time with image documentation (2D), includes M-mode recording, when performed, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress, with interpretation and report; including performance of continuous electrocardiographic monitoring, with physician supervision
+0439T	Myocardial contrast perfusion echocardiography, at rest or with stress, for assessment of myocardial ischemia or viability (List separately in addition to code for primary procedure)

Cardiac Catheterization Procedure Codes

Codes	Cardiac Catheterization Procedures
93451-93464 93566-93568	**Anomalous coronary arteries, patent foramen ovale, mitral valve prolapse, and bicuspid aortic valve**
RHC without LHC or coronaries	
93451	Right Heart Catheterization Including Measurement(S) Of Oxygen Saturation And Cardiac Output, When Performed

Codes	Cardiac Catheterization Procedures
LHC without RHC or coronaries	
93452	Left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
RHC and retrograde LHC without coronaries	
93453	Combined right and left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
Native coronary artery catheterization	
93454	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation
with bypass grafts	
93455	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial venous grafts) including intraprocedural injection(s) for bypass graft angiography
with RHC	
93456	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right heart catheterization
with RHC and bypass grafts	
93457	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography and right heart catheterization
with LHC	

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Codes	Cardiac Catheterization Procedures
93458	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed
with LHC and bypass grafts	
93459	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography
with RHC and LHC	
93460	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed
with RHC and LHC and bypass grafts	
93461	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography
93593-93597	**Congenital Heart Disease Code "Set"**
CPT® 93593 to 93597 are appropriate for invasive evaluation of congenital heart disease	
93593	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; normal native connections

Codes	Cardiac Catheterization Procedures
93594	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; abnormal native connections
93595	Left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone, normal or abnormal native connections
93596	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); normal native connections
93597	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); abnormal native connections

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