



Murmurs

Clinical Guidelines for Medical Necessity Review

Version: V2.0
Effective Date: August 26, 2022

Important Notices

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Guideline Information:

Disease Area: Cardiology

Care Path Group: Diagnostic

Care Path Name: Murmurs

Type: Adult (18+ yo) | Pediatric (0-17yo)

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Literature review current through: August 26, 2022

Document last updated: August 26, 2022

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Care Path Overview

Care Path Clinical Discussion

A heart murmur is an abnormal sound caused by turbulent or abnormal blood flow, either across a heart valve or across a shunt, between an area of high pressure to lower pressure. Heart murmurs may be benign or may be a sign of serious pathology. A cardiac murmur could indicate valvular disease, hypertrophic obstructive cardiomyopathy, or congenital heart disease. It may also be due to a physiologic condition in an otherwise normal heart resulting in increased blood flow through the cardiac chambers, such as anemia, pregnancy, or hyperthyroidism.

A murmur is described by its location, timing, duration, intensity, or loudness, and sound quality. The murmur characteristics and patient history help the physician make a diagnosis and determine further testing. In trained individuals, sensitivity and specificity for murmurs can reach 70% and 98%, respectively.¹

After a thorough history and physical exam, patients with known or suspected valvular disease should undergo an electrocardiogram followed by a transthoracic echocardiogram (TTE). The TTE provides additional information, such as the effect of the valve lesion on the cardiac chambers and great vessels. TTE can also identify additional valve lesions. Other testing such as transesophageal echocardiography (TEE), computed tomography (CT), or cardiac magnetic resonance imaging (MRI) may be appropriate depending on the patient's history, exam, and test results.²

The information contained herein gives a general overview of the pathway of this specific diagnosis, beginning with the initial presentation, recommended assessments, and treatment options as supported by the medical literature and existing guidelines. It should be noted that the care of patients can be complex. The information below is meant to support clinical decision-making in adult patients. It is not necessarily applicable to every case, as the entire clinical picture (including comorbidities, history, etc.) should be considered.

Key Information

- A patient may present with a cardiac symptom, or physicians may find the murmur incidentally.
- Murmurs may be benign or pathologic. The most common valvular disorder in developed countries is aortic valve stenosis, affecting 3% of individuals older than 65.³
- Patients with suspected valvular disease or hypertrophic obstructive cardiomyopathy should have a thorough history and physical exam, and then an ECG. A chest X-ray may also be considered but is not commonly needed.
- Use transthoracic echocardiography for patients with a pathologic systolic or diastolic murmur or for patients with suspected or known valvular or congenital heart disease.^{2,3,4}
- Cardiac catheterization is usually necessary for pre-surgical planning since non-invasive testing is usually sufficient to adequately identify the murmur's source and characterize its functional severity.¹ However, a hemodynamic cardiac catheterization (left and right heart catheterization) may be needed when non-invasive tests are inconclusive or when there is discordance between the severity of clinical symptoms and valvular disease. This scenario may be present in patients with aortic stenosis in whom non-invasive testing suggests mild or moderate stenosis but the patient has symptoms and exam findings suggesting severe stenosis. Similarly, patients with suspected intracardiac shunts in whom non-invasive testing are inconclusive may need catheterization-based hemodynamic evaluation, and patients with aortic or mitral regurgitation may require angiographic assessment when there is discordance between the non-invasive tests and symptoms.

Definitions

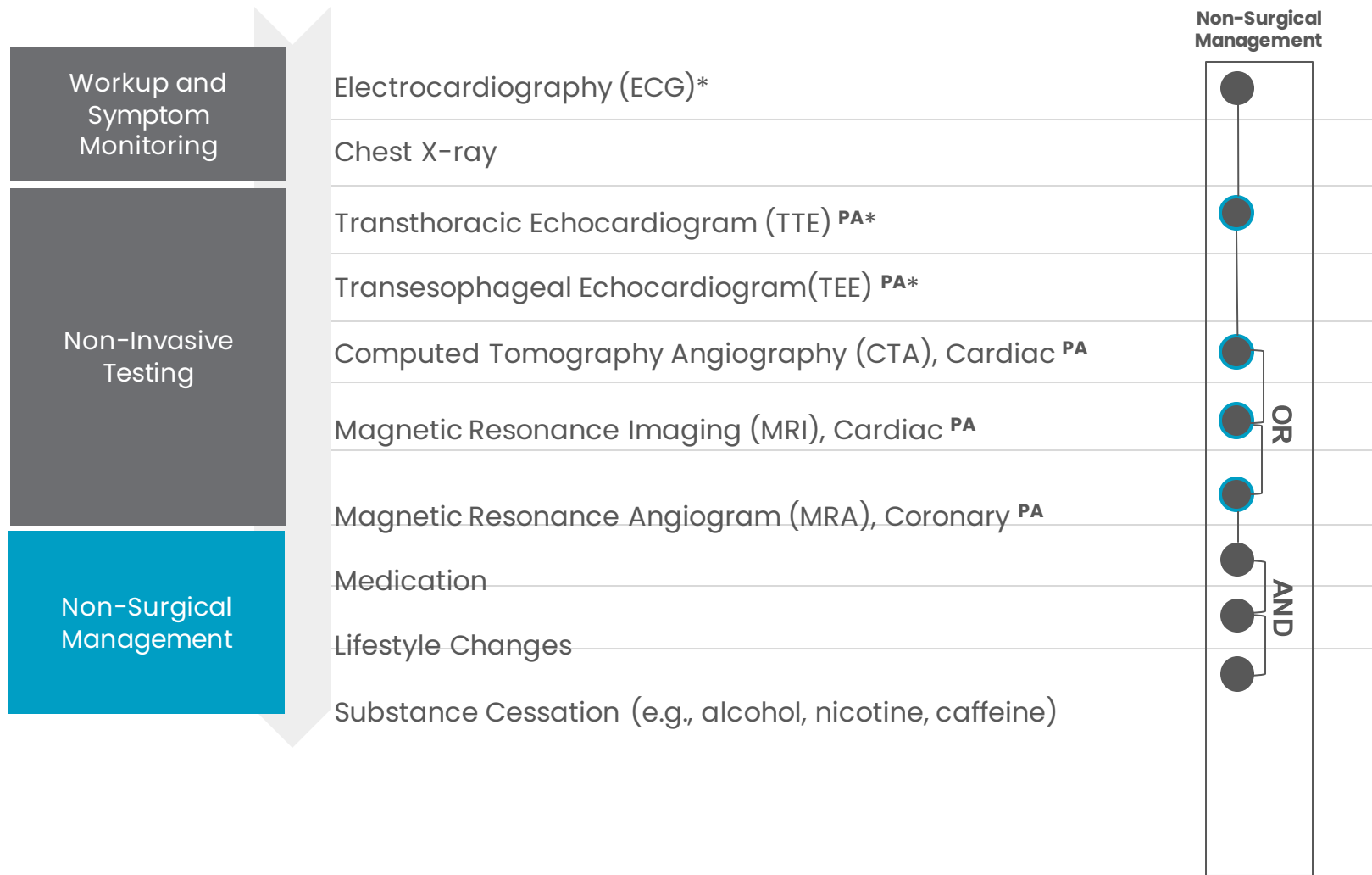
- **Left ventricular outflow tract obstruction (LVOTO):** A complex cardiac defect that interferes with blood ejection from the left ventricle into the ascending aorta.
- **Hypertrophic (obstructive) cardiomyopathy (HCM or HOCM):** A genetic disorder characterized by asymmetric septal hypertrophy causing outflow obstruction of the left ventricle
- **Left lateral decubitus position:** A position where the patient is lying on their left side.
- **Valsalva maneuver:** Forced expiration against a closed glottis, causing an increase in intrathoracic pressure followed by a reduction in preload to the heart.

- **Pretest Probability (of CAD):** The pretest probability of coronary artery disease (CAD) is the likelihood that the patient has CAD, calculated before the test result is known. These guidelines reference the 2019 European Society of Cardiology (ESC) Guidelines for the diagnosis and management of chronic coronary syndromes model to calculate the pretest probability based on age, sex, and type of chest pain.^{5,6}

Murmurs

What is a "Cohere Care Path"?

These Care Paths organize the services typically considered most clinically optimal and likely to be automatically approved. These service recommendations also include the suggested sequencing and quantity or frequency determined clinically appropriate and medically necessary for the management of most patient care scenarios in this Care Path's diagnostic cohort.



Key

- ^{PA} = Service may require prior authorization
- * = Denotes preferred service
- AND = Services completed concurrently
- OR = Services generally mutually exclusive

- = Non-surgical management prior authorization group of services
- = Surgical management prior authorization group of services
- ⋮ = Subsequent service
- ⋮ = Management path moves to a different management path

Care Path Diagnostic Criteria

Disease Classification

ICD-10 Codes Associated with Classification

ICD-10 Code	Code Description/Definition
I34	Nonrheumatic mitral valve disorders
I34.0	Nonrheumatic mitral (valve) insufficiency
I34.1	Nonrheumatic mitral (valve) prolapse
I34.2	Nonrheumatic mitral (valve) stenosis
I34.8	Other nonrheumatic mitral valve disorders
I34.9	Nonrheumatic mitral valve disorder, unspecified
I35	Nonrheumatic aortic valve disorders
I35.0	Nonrheumatic aortic (valve) stenosis
I35.2	Nonrheumatic aortic (valve) stenosis with insufficiency
I35.8	Other nonrheumatic aortic valve disorders
I35.9	Nonrheumatic aortic valve disorder, unspecified
I36	Nonrheumatic tricuspid valve disorders
I36.0	Nonrheumatic tricuspid (valve) stenosis
I36.1	Nonrheumatic tricuspid (valve) insufficiency
I36.2	Nonrheumatic tricuspid (valve) stenosis with insufficiency
I36.8	Other nonrheumatic tricuspid valve disorders
I36.9	Nonrheumatic tricuspid valve disorder, unspecified
I37	Nonrheumatic pulmonary valve disorders
I37.0	Nonrheumatic pulmonary valve stenosis
I37.1	Murmur, Graham Steel
I37.2	Nonrheumatic pulmonary valve stenosis with insufficiency
I37.8	Murmur, pulmonic (valve)
I37.9	Nonrheumatic pulmonary valve disorder, unspecified
R09.89	Bruit (arterial)
R01.0	Cardiac murmur, (benign, functional, innocent, nonorganic)

R01.1	Cardiac murmur, unspecified
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Presentation and Etiology

Causes and Risk Factors

Common causes of murmurs include:

- Valvular disorders such as aortic valve stenosis or mitral regurgitation.
- Inherited structural abnormalities of the heart muscle, such as hypertrophic obstructive cardiomyopathy (HOCM).³
- Hyperdynamic ventricular function or high output states due to severe anemia, pregnancy, fever, or hyperthyroidism.
- Congenital heart defects.¹

Clinical Presentation

Patients with a heart murmur may present with cardiac symptoms, or the murmur may be an incidental finding. When a murmur is detected, the patient's history can provide vital information to lead to the correct diagnosis. A thorough history can reveal associated findings, including⁷:

- Chest pain.
- Shortness of breath.
- Lightheadedness.
- Palpitations.
- Syncope.
- Fatigue
- Diminished exercise tolerance.
- Edema.

The physician should ask the patient about IV drug use, a history of untreated streptococcal pharyngitis or scarlet fever (suggesting rheumatic heart disease), valve replacement history, and a family history of cardiovascular disease or genetic disease. In patients with suspected hypertrophic cardiomyopathy (HCM), physicians should collect a three-generation family history.⁸

Typical Physical Exam Findings

A detailed cardiovascular physical examination is critical in identifying a murmur and its cause. A murmur has a characteristic location, radiation, pitch, volume, and cardiac cycle occurrence. Murmurs may increase or

decrease in volume when the patient performs certain maneuvers, which can help the physician make a proper diagnosis.

A heart murmur may be characterized as “benign,” “innocent,” or “functional” if the sound is caused primarily by increased flow through the heart in the absence of underlying heart disease. These murmurs are usually soft, low in intensity or volume, and occur early in systole. They are associated with normal first and second heart sounds. These murmurs may occur with anemia, fever, anxiety, pregnancy, hyperthyroidism, and in patients with an arteriovenous fistula for dialysis. An innocent, functional, or benign murmur can be diagnosed by a careful history and exam and does not necessarily need additional testing. A primary care provider can usually make this diagnosis or, if unsure, referral to a cardiologist is appropriate

Many disorders have characteristic murmurs, and the following lists, while not all-inclusive, describe many of the most common abnormalities.

Systolic Murmurs

- **Aortic stenosis (AS)**: A harsh systolic ejection murmur begins shortly after S1, peaks toward mid-systole, and ends before S2 (crescendo-decrescendo). It is best heard in the right second intercostal space and radiates into the carotid arteries. The degree of stenosis is more severe when the murmur peaks later in systole. Physicians may also palpate a delayed carotid upstroke and hear a soft or absent aortic valve closure sound. The murmur increases with squatting and decreases with the Valsalva maneuver. If due to a bicuspid aortic valve, the aortic closure sound may be preserved, but an opening “click” may be heard early in systole.⁴
- **Hypertrophic obstructive cardiomyopathy**: A crescendo-decrescendo systolic murmur, best heard between the apex and left sternal border. It may radiate to the suprasternal notch. The murmur increases when the patient moves from supine to standing upright, and with the Valsalva maneuver; it decreases with squatting. The physician may find a double carotid arterial pulse (pulsus bisferiens), a laterally displaced double apical impulse, or a triple apical impulse. A murmur of mitral regurgitation may also be apparent due to systolic anterior motion of the mitral valve.
- **Mitral Valve Prolapse**: A mid-systolic click accompanied by a late systolic murmur that increases with the Valsalva maneuver and decreases with squatting.⁹
- **Mitral regurgitation/insufficiency**: A high-pitched holosystolic murmur is best heard at the apex and radiating to the axilla. The left ventricular impulse may be displaced if the degree of valve insufficiency is severe.⁴

- **Pulmonary stenosis:** A crescendo-decrescendo systolic ejection murmur is louder with inspiration and heard best in the left second intercostal space. The longer the murmur lasts into systole, the more severe the obstruction to blood flow. The physician will often hear a soft, delayed pulmonic valve closure sound (P2).⁴
- **Tricuspid regurgitation:** A blowing, low-pitched, holosystolic murmur that is louder with inspiration and best heard at the lower left sternal border.⁴
- **Atrial Septal Defect:** This is a congenital heart defect; the most common form is a secundum defect. Large defects are associated with large volume left to right shunts and increased pulmonary blood flow. The increased blood volume across the pulmonary outflow tract creates "relative" pulmonary valve stenosis and a systolic, crescendo-decrescendo murmur with a fixed, widely split S2. An astute observer may also hear a diastolic rumble across the tricuspid valve due to the increased blood flow. Smaller defects may not produce any murmurs. A sinus venosus defect is less common, and a primum atrial septal defect is a more significant form of congenital heart disease and is usually identified in childhood. A patent foramen ovale does not result in a heart murmur.
- **Ventricular Septal Defect (VSD):** VSD is a common congenital heart defect. The murmur varies widely depending on the size of the defect, the pulmonary vascular resistance, and the size and direction of the shunt. In the absence of severe pulmonary hypertension and in the absence of a right to left shunt, the murmur is typically prominent and holosystolic in nature. Large VSDs are usually repaired in early childhood, whereas small VSDs may not need repair and can last into adulthood. VSDs can also develop from septal tissue ruptures after myocardial infarction or as a complication after surgery in the subaortic area.

Diastolic Murmurs

- **Aortic regurgitation:** A high-frequency, blowing, and decrescendo diastolic murmur heard in the aortic area and often radiating into the apex. The murmur is best heard in the diaphragm after deep expiration while the patient is sitting and leaning forward. The murmur is increased by squatting and decreased with standing or the Valsalva maneuver.⁷
- **Mitral stenosis:** Typical mitral stenosis exam findings include an opening snap followed by a difficult to hear, low frequency, diastolic rumble best heard at the apex with the patient in the left lateral decubitus position.⁷ It increases with squatting and decreases with the Valsalva maneuver.

- **Pulmonary regurgitation**: A decrescendo diastolic murmur that is louder with inspiration and best heard at the left second intercostal space.⁴
- **Tricuspid stenosis**: An opening snap and a low-pitched rumbling murmur, best heard during inspiration at the left sternal border.⁴

Typical Diagnostic Findings

After a thorough history and physical examination, an ECG, and sometimes a chest x-ray are usually performed. Patients with aortic stenosis may have ECG changes of left ventricular hypertrophy, often with repolarization abnormalities.⁷ Left atrial enlargement and atrial fibrillation are hallmarks of mitral stenosis and mitral regurgitation.⁷ Patients with aortic regurgitation may have a normal ECG early in the disease. Later in the course of AR, patients may have left axis deviation or left ventricular enlargement with or without associated repolarization abnormalities.⁷ Patients with hypertrophic obstructive cardiomyopathy may have voltage changes of left ventricular hypertrophy, ST-T wave changes, deep Q waves, and left atrial enlargement.¹⁰

Although not commonly used today in clinical practice, a chest x-ray can give clues as to the cause of a murmur. Patients with aortic stenosis often have an average cardiac size with rounding of the left ventricular border and apex due to left ventricular hypertrophy.⁷ In patients with chronic aortic regurgitation, chest x-ray often shows an enlarged cardiac silhouette with left ventricle dilatation. When an aortic aneurysm or aortic dissection is present, patients may have an enlarged ascending aorta.⁷ Patients with severe mitral stenosis often have left atrial enlargement.⁷ Chest x-ray in patients with chronic mitral regurgitation may show left ventricular and left atrial enlargement.⁷ However, in the current era, it is uncommon for clinicians to order a chest-X-ray in the evaluation of a heart murmur and, instead, most practitioners rely primarily on the echocardiogram for diagnosis.

For patients with a pathologic murmur and known or suspected valvular or structural heart disease, order a transthoracic echocardiography (TTE).^{2,3,4} TTE allows the physician to confirm the diagnosis, establish etiology, determine severity, assess hemodynamic consequences, determine prognosis, and evaluate the need for potential intervention.²

Two main types of echocardiography are available. Trans-thoracic echocardiography is the least invasive and allows for the immediate diagnosis of conditions such as valvular disease, cardiomyopathy, endocarditis, and aortic dissection. Physical variations may limit TTE effectiveness in some patients (e.g., rib cage abnormalities, extremes of body weight.) In these circumstances, transesophageal echocardiography (TEE) may be appropriate.¹

CT can further define structural heart disease abnormalities and evaluate the presence and severity of aortic root and aortic arch abnormalities.^{7,8} Cardiac magnetic resonance imaging provides excellent anatomic information as well.

Exercise testing is useful in determining functional capacity, especially when symptoms are unclear. In apparently asymptomatic patients with severe AS, exercise testing may elicit symptoms or an abnormal blood pressure response to exercise. Such testing could be dangerous and requires close physician supervision.⁷

Care Path Services & Medical Necessity Criteria

Non-Invasive Testing

Service: Transthoracic Echocardiogram (TTE)

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** A limited echocardiogram is appropriate at certain follow-up intervals to evaluate cardiac anatomy (e.g., a new or worsening structural heart abnormality.) These anatomical abnormalities may or may not be directly a result of the murmur or an underlying arrhythmia.¹¹⁻¹²
- **Recommended Clinical Approach:** A transthoracic echocardiogram is warranted if there are historical risk factors, clinical exam findings, or ECG abnormalities suggesting structural heart disease or coronary artery disease. A thick chest wall (in markedly obese patients) or overcrowded ribs (in severely underweight patients) may limit ultrasound waves' penetration.¹³⁻¹⁴
- **Exclusions:** None.

Medical Necessity Criteria

Indications

- **TTE** is considered appropriate if **ANY** of the following is **TRUE**:
- ◆ The patient has a murmur and at least a moderate probability of one or more of the following¹³⁻²⁰:
 - Valvular heart disease.
 - Pericardial disease.
 - Cardiomyopathy.
 - Congenital heart disease.
 - Heart failure.
 - ◆ The patient has a murmur and an additional sign or symptom, including **ANY** of the following:
 - Shortness of breath.
 - Chest pain.
 - Syncope.
 - Neurologic symptoms.
 - A peripheral embolic event.

- Edema or ascites.
 - Decreased exercise tolerance or exercise capacity.
 - Unexplained fever.
 - Atrial or ventricular arrhythmia.
- ◆ A murmur in an asymptomatic patient in whom there is a low probability of heart disease but in whom the diagnosis of heart disease cannot be reasonably excluded by the standard cardiovascular clinical evaluation.

Non-Indications

- **TTE** is not considered appropriate if **ANY** of the following is **TRUE**:
- ◆ Echocardiography has no contraindications. However, echocardiography can be technically challenging in patients who have limited mobility or cannot lie flat. Echocardiography may have limited benefit in patients at the extremes of adult body weight. A thick chest wall (in markedly obese patients) or overcrowded ribs (in severely underweight patients) may limit the penetration of ultrasound waves.¹³⁻¹⁴ Despite this, it is reasonable to attempt scanning a patient with potential imaging limitations, given the procedure's overall safety.

Site of Service Criteria

Outpatient, Inpatient, or Observation Status

Procedure Codes (HCPCS/CPT)

HCPCS/CPT Code	Code Description/Definition
93303	Complete transthoracic echocardiography for congenital cardiac anomalies
+93320	Doppler Echocardiography, pulsed wave and/or continuous wave with spectral display (List separately in addition to codes for 2D echocardiographic imaging); complete.
+93321	Doppler Echocardiography, pulsed wave and/or continuous wave with spectral display (List separately in addition to codes for 2D echocardiographic imaging); follow up or limited.
+93325	Doppler echocardiography color flow velocity mapping (List separately in addition to codes for echocardiographic imaging)

93304	Follow-up transthoracic echocardiography for congenital cardiac anomalies
93306	Real time transthoracic echocardiography with 2-dimensional (2D) image documentation, M-mode recording with spectral Doppler echocardiography, and color flow Doppler echocardiography
93307	Complete real time transthoracic echocardiography with 2-dimensional (2D) image documentation
93308	Follow-up real time transthoracic echocardiography with 2-dimensional (2D) image documentation
C8921	Tte w or w/o fol w/cont, com
C8922	Tte w or w/o fol w/cont, f/u
C8923	2d tte w or w/o fol w/con,co
C8924	2d tte w or w/o fol w/con,fu
C8929	Tte w or wo fol wcon,doppler

Service: Computed Tomography Angiography (CTA), Cardiac

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** Clinical reason and judgment according to college and clinical practice guidelines and usage of the ACR Appropriateness Criteria.
- **Recommended Clinical Approach:** Cardiac CTA has a limited and secondary role in evaluating cardiac murmurs. CTA may also be appropriate for patients with new or worsening dyspnea and known or suspected valvular heart disease or pulmonary disease (e.g., asthma, COPD, interstitial lung disease).²¹⁻³⁰
- **Exclusions:** Contrast CTs are not appropriate for patients with severely impaired renal function (CrCl < 30 cc/min) not yet on dialysis and for patients with a history of contrast allergy who cannot be pre-medicated appropriately. This protocol includes cardiac CTA for cardiac anatomic evaluation. Other study protocols (e.g., calcium scoring, coronary CTA) may require different diagnostic indications and fall out of this scope.

Medical Necessity Criteria

Indications

- **Cardiac CTA** is considered appropriate if **ANY** of the following is **TRUE**:
- ◆ The patient has new or worsening dyspnea and one or more of the following¹:
 - Valvular heart disease.
 - Pulmonary disease.
 - ◆ The patient has an extrathoracic disease that may involve the heart (e.g., sarcoidosis, amyloidosis, cancer).³¹⁻³²
 - ◆ There is a known or suspected cardiovascular abnormality (congenital or acquired), including aortic stenosis, aortic aneurysms, and dissection.³³⁻³⁵
 - ◆ There is known or suspected pulmonary arterial hypertension.³⁶
 - ◆ The patient had an abnormal transthoracic echocardiogram or inadequate images from other noninvasive methods.

Non-Indications

- **Cardiac CTA** may not be indicated if **ANY** of the following is **TRUE**¹²:

- ◆ The patient has chest pain with a high probability of ischemic disease.
- ◆ The patient has non-rate-controlled atrial fibrillation.
- ◆ The patient has contrast dye hypersensitivity and cannot be pre-medicated.
- ◆ The patient has severe renal insufficiency (CrCl < 30 cc/min and is not yet on dialysis).
- ◆ The patient is pregnant.
- ◆ The patient takes metformin, and this cannot be held for 48 hours after contrast administration

Site of Service Criteria

Outpatient or Inpatient

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
75572	Computed tomography (CT) of heart with contrast material for evaluation of cardiac structure and morphology, including 3-dimensional (3D) image postprocessing, assessment of cardiac function, and evaluation of venous structures
75573	Computed tomography (CT) of heart with contrast material for evaluation of cardiac structure and morphology in congenital heart disease

Service: Magnetic Resonance Imaging (MRI), Cardiac

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** Considerations of additional phase, dynamic sequences, positioning of the patient, and use of markers at the discretion of the protocoling radiologist.
- **Recommended Clinical Approach:** Magnetic resonance imaging (MRI) has a limited role in evaluating cardiac murmurs. Cardiac MRI is helpful in assessing hypertrophic cardiomyopathy (HCM) with left ventricular outflow tract obstruction (LVOTO). Cardiac MRI may help evaluate heart murmurs in the setting of other cardiomyopathies (e.g., sarcoidosis) when echocardiography was inconclusive.³⁷
- **Exclusions:** Exclusions include contraindications of MRI (e.g., retained metal, incompatible width to bore size, claustrophobia), incompatibility with following directions (i.e., breath-hold), and renal insufficiency (eGFR less than 30 mL/min per 1.73 m²) if gadolinium is requested²⁰.

Medical Necessity Criteria

Indications

- **Cardiac MRI** is considered appropriate if **ALL** of the following are **TRUE**¹³:
- ◆ Prior cardiac imaging testing either²⁰:
 - Failed to characterize a cardiac basis for murmurs; OR
 - Revealed abnormal findings better characterized by cardiac MRI.
 - ◆ The patient has one or more of the following²⁰:
 - Objective evidence of cardiomyopathy.
 - Suspicion of a lethal heart rhythm disorder (e.g., ventricular tachyarrhythmias or heart block).
 - Congenital Heart Disease.
 - An extrathoracic disease that may involve the heart (e.g., sarcoidosis, amyloidosis, cancer).
 - Pulmonary Hypertension.
 - Congestive Heart Failure.
 - Suspected cardiac mass (e.g., thrombus, malignancy).
 - A disease of the thoracic aorta.
 - Myocarditis or pericarditis.

Non-Indications

- **Cardiac MRI** is not indicated if **ANY** of the following are **TRUE**^{20,37}:

- ◆ MRI is the initial imaging modality.
- ◆ The patient has non-compatible implanted devices.
- ◆ The patient has metallic intraocular foreign bodies.
- ◆ There is a potential for adverse reactions to contrast media.
- ◆ The patient has severe claustrophobia.
- ◆ If the patient has renal insufficiency (eGFR less than 30 mL/min per 1.73 m²) and if gadolinium contrast is requested, an MRI/MRA may not be considered appropriate.

Site of Service Criteria

Outpatient or Inpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
75557	Cardiac magnetic resonance imaging (MRI) without contrast material, for evaluation of morphology and function
75559	Cardiac magnetic resonance imaging (MRI) with stress imaging, without contrast material, for evaluation of morphology and function
75561	Cardiac magnetic resonance imaging (MRI) without contrast material, followed by contrast material and further sequences, for evaluation of morphology and function
75563	Cardiac magnetic resonance imaging (MRI) with stress imaging, without contrast material, followed by contrast material and further sequences, for evaluation of morphology and function
C9762	Cardiac magnetic resonance imaging for morphology and function, quantification of segmental dysfunction; with strain imaging
C9763	Cardiac magnetic resonance imaging for morphology and function, quantification of segmental dysfunction; with stress imaging
S8042	MRI Low Field

Service: Transesophageal Echocardiogram (TEE)

General Guidelines

- **Units, Frequency, and Duration:** Single procedures performed as needed for defined criteria.
- **Criteria for Subsequent Requests:** Based on subsequent events as described in medical necessity criteria.
- **Recommended Clinical Approach:** A transesophageal echocardiogram (TEE) helps evaluate heart structures, including better imaging of mitral valve function and the atrial septum. This imaging is usually performed by a dedicated cardiac sonographer and a trained cardiologist^{1,20}.
- **Exclusions:** None.

Medical Necessity Criteria

Indications

- **TEE** is considered appropriate if **ANY** of the following are **TRUE**^{1,14}:
- ◆ The information from a previous TTE was inadequate, or TTE results were discordant with clinical findings.
 - ◆ The patient has one or more of the following documented within or planning within 3 months:
 - A cardiac interventional procedure (surgical or transcatheter) is planned.
 - Systemic embolization has occurred, and one or more of the following is true:
 - A cardiac source (such as an ASD or PFO) is suspected.
 - Concern for endocarditis
 - The patient has a history of atrial fibrillation.
 - A patient with paroxysmal or persistent atrial fibrillation with a CHA₂DS₂-VASc score greater than 1 presenting for planned cardioversion.
 - The patient is to have an ablation/pulmonary vein isolation.

Non-Indications

- **TEE** may not be indicated if **ANY** of the following is **TRUE**:
- ◆ Another imaging modality (CT or MRI) was requested simultaneously for the same indication.
 - ◆ The patient has a history of esophageal stricture, malignancy, recent surgery of the esophagus, active GI bleeding, esophageal varices (relative), or prior surgery (relative).

- ◆ The patient has a history of undiagnosed dysphagia.

Site of Service Criteria

Outpatient or Inpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
93312	Real time transesophageal echocardiography with 2-dimensional (2D) image documentation, M-mode recording, probe placement, image acquisition, interpretation, and report
93313	Real time transesophageal echocardiography with 2-dimensional (2D) image documentation and placement of transesophageal probe only
93314	Interpretation and report only of real time transesophageal echocardiography with 2-dimensional (2D) image documentation and image acquisition
93315	Transesophageal echocardiography (TEE) with probe placement, image acquisition, interpretation, and report
93316	Transesophageal echocardiography (TEE) for placement of transesophageal probe only
93317	Interpretation and report only of transesophageal echocardiography (TEE) with image acquisition
93318	Real time transesophageal echocardiography (TEE) with probe placement, 2-dimensional (2D) image acquisition and interpretation
C8925	2d tee w or w/o fol w/con,in
C8926	Tee w or w/o fol w/cont,cong
C8927	Tee w or w/o fol w/cont, mon

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Clinical Guideline Revision History/Information

Original Date: January 28, 2022	
Review History	
January 28, 2022 (V.1)	Physician author: Mary Krebs, MD (Primary Care Physician), Kenneth Korr, MD (Cardiologist, Internist), Giovanni Lorenz, MD (Radiologist) Peer reviewed by: Carter Newton, MD FACC (Cardiologist), Russell Rotondo, MD FACC (Cardiologist) Approving Physician: Russell Rotondo, MD FACC (Cardiologist)
August 26, 2022 (V2.0)	Peer reviewed by: Michael Ragosta, MD (Cardiologist) Approving Physician: Russell Rotondo, MD FACC (Cardiologist)