Evolent Clinical Guideline ~~0677~~7337 for Transthoracic Echocardiogram (TTE)

Guideline ~~or Policy~~ Number:	Applicable Codes
Evolent_CG_~~0677~~7337	

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STATEMENT

General Information

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

Purpose

Transthoracic echocardiography (TTE) uses ultrasound to image the structures of the heart providing 2-dimensional, cross-sectional images. The addition of Doppler ultrasound derives hemodynamic data from flow velocity versus time measurements, as well as from color-coded two-dimensional representations of flow velocities.

Clinical Reasoning

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

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. [1,2,3,4,5]

INDICATIONS FOR TRANSTHORACIC ECHOCARDIOGRAPHY (TTE) ADULT PATIENTS [6]

(Indications for **pediatric patients** follow this section)

Evaluation of Cardiac Structure and Function

- When initial evaluation including history, physical examination, electrocardiogram (ECG), remote monitor or other testing suggests a cardiac etiology for symptoms, including but not limited to: **(AUC Score 9)** [7]

- Chest pain when another study is not planned to evaluate.
- Shortness of breath
- Palpitations

- Hypotension suggestive of cardiac etiology not due to other causes, such as~~:~~ medications, dehydration, or infection **(AUC Score 8)** [7]

  ~~o Medications, dehydration, or infection~~

- ECG Abnormalities
  - Previously unevaluated pathological Q waves (in two contiguous leads) defined as the following:
    - 40 ms (1 mm) wide
    - > 2 mm deep
    - > 25% of depth of QRS complex
  - New left bundle branch block **(AUC Score 7)** [7]

    ~~■ New isolated RBBB is **not** an indication for TTE.~~
  - New second-degree Mobitz II atrioventricular block, high grade atrioventricular block or third-degree atrioventricular block [8]
  - Symptomatic or asymptomatic patients with previously unevaluated left ventricular hypertrophy (i.e., concern for hypertrophic cardiomyopathy). **(AUC Score 9)** [7]

Murmur or Click

- Initial evaluation when there is a reasonable suspicion for valvular or structural heart disease such as: **(AUC Score 9)** ~~[8]~~[9]
  - High grade ≥ 3/6

    ~~:~~ Note that TTE can be approved for documented concern that murmur suggests a **specific valve pathology** (such as "aortic valve sclerosis/stenosis" or "mitral regurgitation") **regardless of grade of murmur**
  - Holosystolic
  - Continuous
  - Diastolic

Arrhythmias

- Frequent premature ventricular contractions (PVCs, greater than 30 per hour on remote monitoring or ≥ 1 PVC on 12 lead ECG) **(AUC Score 7)** [7]
  - Isolated premature atrial complexes (PACs) are **NOT** an indication for TTE [10]
- Sustained or nonsustained ventricular tachycardia (VT) or ventricular fibrillation (VF), or ventricular bigeminy **(AUC Score 9)** [7]
- New onset atrial fibrillation (as documented in MD notes and on ECG) which was not evaluated by a prior transthoracic echocardiogram (TTE) [11] **(AUC Score 8)** [7]

- Initial evaluation of SVT seen on ECG or remote monitoring without other evidence of heart disease **(AUC Score 6)** [9](7)
- Initial evaluation of inappropriate sinus tachycardia (defined as average heart rate ≥ 90 beats/minute on ambulatory monitoring, after other etiologies have been excluded (i.e., anemia, hyperthyroidism))

Syncope [8,10](7,12)

- History, physical examination, or electrocardiogram (ECG) consistent with a cardiac diagnosis known to cause presyncope or syncope, including but not limited to: **(AUC Score 9)** [7]
  - Structural heart disease (including but limited to):
    - Hypertrophic cardiomyopathy
    - Systolic heart failure
  - Exercise-induced syncope.
- And not due to other causes such as:
  - Vaso-vagal syncope, neurogenic orthostatic syncope
  - Orthostasis related to medication or dehydration.

Perioperative Evaluation [11,12](13,14)

- Preoperative left ventricular function assessment in patients who are candidates for solid organ transplantation (can be done yearly prior to transplant) **(AUC 8)** [Score 7)** [13]

Pulmonary Hypertension

- Evaluation of suspected pulmonary hypertension including evaluation of right ventricular function and estimated pulmonary artery pressure **(AUC Score 9)** [7]
- Re-evaluation of known pulmonary hypertension if there is a change in clinical status or cardiac exam or a need to change medications [13], [15] such as: **(AUC Score 8)** [7]
  - New chest pain
  - Worsening shortness of breath
  - Syncope
  - Increased murmur
  - Worsening rales on lung examination
- Initial evaluation of patients with pulmonary embolism to risk stratify and initiate appropriate therapy [14](16)
  - Repeat TTE can be approved for persistent dyspnea 3-6 months after PE [15](17) to evaluate for possible chronic thromboembolic pulmonary hypertension (CTEPH)
- Annual screening can be performed for pulmonary hypertension in patients with [13,](16,18).

- Scleroderma
- Portal hypertension (including evaluation prior to TIPS procedure)
- Carriers of Bone Morphogenic Protein Receptor 2 (BMPR2) mutation
- Sickle cell disease

Known Valvular Heart Disease

Symptomatic

- **New** clinical signs and symptoms (SOB/fatigue) with known **mild** valvular heart disease or known **moderate to severe** valvular heart disease. **(AUC Score 9)** [8][9]

Native Valvular Stenosis [8][9]

Asymptomatic (Routine re-evaluation)

- RoutineRoutine surveillance (≥ 3 yrs.) of bicuspid aortic valve, aortic valve sclerosis or mild valvular stenosis, every ≥ 3 years **(AUC Score 9)** [9]
- Re-evaluation (≥ 1 yr.) of moderate stenosis, every ≥ 1 year **(AUC Score 7)** [9]
- Re-evaluation of severe aortic stenosis (AS) every ≥ 6 - 12 months **(AUC Score 6)** [9]
- Re-evaluation after control of hypertension in patients with low flow/low gradient severe aortic stenosis **(AUC Score 7)** [9]

Native Valvular Regurgitation [8,17,18][9,19]

Asymptomatic (Routine re-evaluation)

- ≥Every 3 yrs. of mild valvular regurgitation **(AUC Score 8)** [8][9]
- ≥ 1 yr.Annually of moderate valvular regurgitation **(AUC Score 7)** [9]
- Asymptomatic patient every 6 - 12 months with severe valvular regurgitation **(AUC Score 7)** [9]

Prosthetic Valves/Native Valve Repair [19]

- Initial evaluation of prosthetic valve or native valve repair, for establishment of baseline, typically 6 weeks to 3 months postoperative and: **(AUC Score 9)** [8][9]
  - **Routine surveillance (Asymptomatic)**
    - Surgical bioprosthetic valve
      - Every 3 years after surgerypost implantation **(AUC Score 7)** [8][9]
      - 10 years postoperatively and annually thereafter [19]
    - Surgical mechanical valve
      - 10Every 3 years postoperatively and annually thereafterpost implantation **(AUC 7)** [9] [8]
    - SurgicalSurgical mitral valve repair
      - 1-year post-op and then every 2-Every 3 years post repair **(AUC 8)** [8][9]

- Evaluation of prosthetic valve or native valve repair with suspected dysfunction, with symptoms including but not limited to: **(AUC Score 9)** [8][9]
  - Chest pain
  - Shortness of breath
  - New or Increased murmur on heart examination
  - New rales on lung examination
  - Elevated jugular venous pressure on exam

Transcatheter Heart Interventions

Transcatheter Aortic Valve Replacement (TAVR) [8][9,20],[21]

- Pre TAVR evaluation
- Post TAVR at 30 days (6 weeks to 3 months also acceptable) and annually **(AUC Score 8)** [8][9]
- Assessment post TAVR when there is suspicion of valvular dysfunction, including but not limited to: **(AUC Score 8)** [8][9]
  - Chest pain
  - Shortness of breath
  - New or increased murmur on heart examination
  - CVA post TAVR **(AUC Score 7)**
- Assessment of stroke post TAVR **(AUC Score 7)** [8][9]

Percutaneous Transcatheter Mitral Valve Repair (PMVR) [8,17,20]*TMVR)* [9,21]

- Pre-procedure evaluation **(AUC Score 8)** [8][9]
- Reassessment for degree of MR and left ventricular function (1, 6 months, and annually) **(AUC Score 9)** [7][9]
- Assessment post TMVRTransmitral Vavle Repair (TMVR) when there is suspicion of valvular dysfunction, including but not limited to: **(AUC 8)** [8]**Score 9)** [9]
  - Chest pain
  - Shortness of breath
  - New or increased murmur on heart examination
  - CVA post TMVR

Closure of PFO or ASD [7][22]

- Pre-procedure evaluation **(AUC 9)** [22]
- Routine follow-up post procedure for device position and integrity (see **Table 2: Adult and Pediatric Congenital Heart Disease Follow-Up**) **(AUC Score 9)** [22]
- Evaluation for clinical concern for infection, malposition, embolization, or persistent

shunt **(AUC Score 9)** [22]

- Routine surveillance of an asymptomatic patient with a PFO is **not** indicated [22]

Left Atrial Appendage (LAA) Occlusion [7]

- Pre-procedure evaluation **(AUC Score 8)** [7]

Pericardial Disease [7,~~14~~17,23) ~~,24)~~

- Suspected pericarditis or pericardial effusion **(AUC Score 9)** [7]
- Re-evaluation of a significant known pericardial effusion when findings would lead to change in management **(AUC Score 7)** [7]
- Suspected pericardial constriction or reevaluation of status when management would be changed

Evaluation of Cardiac Source of Emboli or Cardiac Mass ~~(8)~~(7)

- Embolic source in patients with recent transient ischemic attack (TIA), stroke, or peripheral vascular emboli **(AUC Score 9)** [7]
- Evaluation of intracardiac mass or re-evaluation of known mass. No echo performed within the last three months ~~(25)~~(24) **(AUC Score 8)** [7]

Infective Endocarditis (Native or Prosthetic Valves) ~~(8,20,26)~~(9,19)

- Initial evaluation of suspected infective endocarditis with positive blood cultures or a new murmur **(AUC 9)** ~~(8)~~(9)
- Re-evaluation
  - Infective endocarditis with, but not limited to: **(AUC Score 9)** ~~(8)~~(9)
    - Changing cardiac murmur
    - Evidence of embolic phenomena such as TIA or CVA
    - New chest pain, shortness of breath, or syncope
    - A need to change medications due to ongoing fever, positive blood cultures, or evidence of new AV block on ECG.
  - Infective endocarditis at high risk of progression or complication (extensive infective tissue/large vegetation, or staphylococcal, enterococcal, or fungal infections) **(AUC 7)** ~~(8)~~(9)
- At completion of antimicrobial therapy and serial examinations at 1, 3, 6, and 12 months during the subsequent year ~~(26)~~(25)

Thoracic Aortic Disease ~~((~~(26,27) ~~,28,29,30,31,32)~~

In the absence of recent computed tomography (CT) or cardiovascular magnetic resonance (CMR), which are preferred for imaging beyond the proximal ascending aorta.

- Screening of first-degree relatives of individuals with:
  - Thoracic aortic aneurysm (defined as ≥ 50% above normal) or dissection
  - Bicuspid aortic valve
  - Presence of an aortopathic syndrome (i.e., Marfan's, Ehlers-Danlos, Loeys-Dietz, or Turner's)
- If one or more first-degree relatives of a patient with a known thoracic aortic aneurysm or dissection, have thoracic aortic dilatation, aneurysm, or dissection; then imaging of 2nd degree relatives is reasonable
- Six-month follow-up after initial finding of a dilated thoracic aorta
- Annual follow-up of enlarged thoracic aorta that is above top normal for age, gender, and body surface area
- Biannual (twice/year) follow-up of enlarged aortic root ≥ 4.5 cm or showing growth rate ≥ 0.5 cm in one year or ≥ 0.3cm per year in 2 consecutive years for sporadic aneurysms and ≥ 0.3cm in 1 year for heritable thoracic aortic disease or bicuspid aortic valve (28)(27)
- Evaluation of the ascending aorta in known or suspected connective tissue disease or genetic conditions that predispose to aortic aneurysm or dissection (e.g., Marfan syndrome, Ehlers-Danlos or Loeys-Dietz syndromes) at time of diagnosis and 6 months thereafter for growth rate assessment, followed by annual imaging, or biannual (twice yearly) if diameter ≥ 4.5 or expanding ≥ 0.3 cm/yr. **(AUC Score 8)** (7)
- Turner's Syndrome:
  - Baseline evaluation at the time of diagnosis to assess for bicuspid aortic valve, coarctation of the aorta, aortic root and ascending aortic dilatation and other congenital defects.
  - Surveillance imaging (initial imaging normal and no additional risk factors for dissection such as HTN or bicuspid aortic valve):
    - Children: every 5 years
    - Adults: every 10 years
    - Prior to planned pregnancy
    - Annual imaging can be approved if an abnormality is found (such as bicuspid aortic valve)
- Re-evaluation of known ascending aortic dilation or history of aortic dissection with one of the following:
  - New chest pain
  - Shortness of breath
  - Syncope
  - TIA or CVA
  - New or increased aortic valve murmur on clinical examination.
  - New rales on lung examination or increased jugular venous pressure
  - ~~OR~~ When findings would lead to referral to a procedure or surgery

- Follow-up of aortic disease when there has been no surgical intervention:
  - Acute dissection: 1 month, 6 months, 12 months, then annually
  - Chronic dissection: annually
- Follow-up thoracic aortic aneurysm repair: chest CTA or chest MRA are the recommended surveillance imaging modalities.
- Follow-up post either: Root repair or AVR plus ascending aortic root/arch repair: baseline post-op, then annually
- Evaluation of sinus of Valsalva aneurysms and associated shunting secondary to rupture .~~(32)~~(26)

Hypertension (HTN) (Adult) (7,27)~~28)~~

- Initial evaluation of suspected hypertensive heart disease including but not limited to the following **(AUC Score 8)** (7):
  - Left ventricular hypertrophy on ECG
  - Cardiomegaly
  - Evidence of clinical heart failure
- Initial evaluation of uncontrolled, resistant HTN without symptoms on three or more anti-hypertensive drugs.

Hypertension (HTN) (Pediatric) ~~(33)~~(28)

(AUC 9) ~~(34)~~(29)

- Initial evaluation at time of consideration of pharmacologic treatment of HTN
- Re-evaluation at 6–12-month intervals for:
  - Persistent HTN despite treatment
  - Concentric LVH on prior study
  - Reduced LVEF on prior study
- Re-evaluation of patients without LVH on initial evaluation can have TTE annually for:
  - Stage 2 HTN (BP ≥140/90 mmHg)
  - Secondary HTN
  - Chronic stage 1 HTN (BP between 130/80 mmHg and 139/89 mmHg) incompletely treated, including drug resistance and noncompliance

Heart Failure (7,30,31) ~~35,36,37)~~

- Initial evaluation of suspected HF (systolic or diastolic) based on symptoms, signs, or abnormal test result, including but not limited to: **(AUC Score 9)** (7)
  - Dyspnea
  - Orthopnea
  - Paroxysmal nocturnal dyspnea

- Worsening edema
- Elevated BNP

- Re-evaluation
  - Known HF (systolic or diastolic)
    - With a change in clinical status or cardiac exam (as listed above)
    - Asymptomatic patient with change in GDMT

Cardiomyopathy

- Initial evaluation of suspected inherited or acquired cardiomyopathy, including but not limited to: **(AUC Score 9)** [7]
  - Restrictive
  - Infiltrative/Depositional (i.e., hemochromatosis/iron overload, mucopolysaccharidoses, mitochondrial or metabolic storage disease (e.g., Danone disease, Fabry disease))
    - Fabry disease: annual surveillance TTE may be approved for patients receiving enzyme replacement [~~25~~24]
  - Dilated
  - Hypertrophic
  - Re-evaluation of known cardiomyopathy if there is a need to monitor a change in medications or new symptoms, including but not limited to:
    - Chest pain
    - Shortness of breath
    - Palpitations
    - Syncope
- Heart failure (including Takotsubo cardiomyopathy) [~~25~~24] with recovered left ventricular ejection fraction defined as (must meet all 3 criteria):
  - Documentation of a decreased LVEF <40% at baseline
  - ≥10% absolute improvement in LVEF
  - A second measurement of LVEF >40% [~~38~~32]:
    - Repeat echocardiogram every 6 months until 12-18 months after recovery of EF, then annually for 2 years, then every 3-5 years
    - Higher risk patient (persistent left bundle branch block, genetic cardiomyopathy, higher biomarker profiles) may have annual follow-up.
- Screening evaluation in first-degree relatives of a patient with an inherited cardiomyopathy **(AUC Score 9)** [7]
- Suspected cardiac sarcoidosis, including as a screening study in patients with biopsy proven extracardiac sarcoidosis [~~39~~33]
- Suspected cardiac amyloid and to monitor disease progression and/or response to therapy, and to guide initiation and management of anticoagulation (TEE may be

preferred) [40](34)

- Light chain amyloidosis (AL): TTE may be repeated every 3-6 months.
- Transthyretin amyloidosis (ATTR): TTE may be repeated every 6-12 months [25](24)

Hypertrophic Cardiomyopathy (HCM) [41](35)

- Initial evaluation of suspected HCM
- Re-evaluation of patients with HCM with a change in clinical status or a new clinical event
- ~~Evaluation of the result of surgical myomectomy or alcohol septal ablation~~
- Re-evaluation in patients with no change in clinical status or events ~~every 1 - 2 years~~or annually to assess degree of myocardial hypertrophy, dynamic obstruction, MR, and myocardial function
- Evaluation of the result of surgical myomectomy or alcohol septal ablation
- Evaluation of patients with HCM who have undergone septal reduction therapy within 3-6 months after the procedure
- Screening for patients who are clinically unaffected or (genotype-positive and phenotype-negative):
  - Children and adolescents~~, every 1-2 years~~: annually
  - Adults: every 3~~-5~~ years
- Screening of first-degree relatives is recommended at the time HCM is diagnosed in the family member and serial follow-up as below:
  - Children and adolescents from genotype-positive families and families with early onset disease ~~every 1-2 years~~: annually
  - All other children and adolescents: every 2~~-3~~ years
  - Adults: every 3~~-5~~ years
- To guide therapy
  - Camzyos (mevacamten): baseline TTE prior to initiation. Repeat TTE during therapy at the discretion of the ordering specialist . [42](36)

Imaging Surveillance for Cardiotoxic Exposures ~~43,44~~(37,38)

- TTE is the method of choice for the evaluation of patients who will receive or have received cardiotoxic medication. TTE may be approved for:
  - Baseline assessment prior to initiation of therapy **(AUC Score 9)** (7)
  - Monitoring during therapy. The frequency of testing should be left to the discretion of the ordering physician, but in the absence of new abnormal findings, generally no more often than every 6 weeks while on active therapy. **(AUC Score 7)** (7)
  - Long term surveillance after completion of therapy may be required, especially for those who have been exposed to anthracycline medication. The frequency of

testing is generally every 6-12 months, or at the discretion of the provider. (**AUC Score 7)** [7]

Imaging Surveillance for Previous Radiation Therapy with Cardiac Exposure ~~(45)~~(38)

- TTE is indicated for long term surveillance, generally at 5 years and at 10 years following radiation exposure. More frequent surveillance may be indicated at the discretion of the provider.

Device Candidacy or Optimization (Pacemaker, ICD, or CRT) [7]

- Initial evaluation or re-evaluation after revascularization (≥ 90 days) and/or myocardial infarction (≥ 40 days) and/or 3 months of guideline-directed medical therapy when ICD is planned **(**[46] ~~(~~**AUC Score 9)** [7]
- Initial evaluation for CRT device optimization after implantation **(AUC Score 7)** [7]
- Re-evaluation for CRT device optimization in a patient with worsening heart failure **(AUC Score 8)** [7]
- Known implanted pacing device with symptoms possibly due to device complication or suboptimal pacing device settings **(AUC Score 8)** [7]

Ventricular Assist Devices (VADs) and Cardiac Transplantation [7,39] ~~47)~~

- To determine candidacy for VAD **(AUC Score 9)** [7]
- Optimization of VAD settings and assessment of response post device **(AUC Score 8)** [7]
- Re-evaluation for signs/symptoms suggestive of VAD-related complications, including but not limited to: **(AUC Score 8)** [7]
  - TIA or stroke
  - Infection
  - Murmur suggestive of aortic insufficiency
  - Worsening heart failure

Post Heart Failure Transplant Surveillance Imaging [40]

- Monitoring at the discretion of the transplant center for rejection in a cardiac transplant recipient~~.~~ [48] **(AUC Score 8)** [7]

Cardiovascular Disease in Pregnancy ~~(9,49)~~(41)

- Valvular stenosis
  - Mild can be evaluated each trimester and prior to delivery.
  - Moderate-severe can be evaluated monthly.

- Valvular regurgitation
  - Mild-moderate regurgitation can be evaluated each trimester and prior to delivery
  - Severe regurgitation can be evaluated monthly
- Pre-pregnancy evaluation with mechanical or bioprosthetic heart valves (if not done within the previous year) [(19)] **(AUC Score 9)** [~~(8)~~(9)]
- Peripartum Cardiomyopathy: can be repeated at the end of the 1st and 2nd trimesters, 1 month prior to delivery, 1 month postpartum, and serially including up to 6 months after normalization of ejection fraction [(42)]
- Aortopathic syndromes (i.e., Marfan's, Ehlers-Danlos, Loeys-Dietz Syndrome, or Turner's Syndrome) or known dilated aortic root or ascending aorta: may be approved for pre-pregnancy planning and for monitoring each trimester during pregnancy and again several weeks post-partum. More frequent imaging may be approved depending on aortic diameter, aortic growth rate and comorbidities predisposing to dissection (i.e., presence of an aortopathic syndrome, HTN). [~~(28)~~(27)]

Adult Congenital Heart Disease (22,43) ~~50)~~

- Initial evaluation including history, physical examination, electrocardiogram (ECG), or other imaging modality suggest adult congenital heart disease
- Screening of first-degree relatives of patients with a bicuspid aortic valve **(AUC Score 8)** [~~(8)~~(9)]
- Known adult congenital heart disease with a change in clinical status or cardiac exam, including but not limited to:
  - Chest Pain
  - Shortness of breath
  - New or increased murmur on physical exam
- Evaluation prior to surgical or transcatheter procedure
- For follow-up of specific lesions, see **Table 1** and **Table 2** ~~for:~~ **Adult and Pediatric Congenital Heart Disease Follow-up**

Inflammatory and Autoimmune

- Including any one of the following:
  - Suspected rheumatic fever [~~(51)~~(44)]
  - Systemic lupus erythematosus [~~(52)~~(45)]
  - Takayasu arteritis [~~(53)~~(46)]
  - Multisystem Inflammatory Syndrome in children (MIS-C): at baseline and for surveillance when there is documented concern for coronary involvement or other late sequelae [~~(54)~~(47)]
  - Kawasaki disease [~~(55)~~(48)]
    - Upon diagnosis, 1-2 weeks later, and 4 to 6 weeks after diagnosis
    - For patients with important and evolving coronary artery abnormalities during

the acute illness, echocardiograms may need to be more frequent. In the setting of increasing size of coronary aneurysms, echocardiogram can be performed up to twice per week until dimensions have stopped progressing, then at least once per week in the first 45 days of illness, and then monthly until the third month after onset.

- For persistent coronary aneurysm after the acute illness, echocardiogram surveillance intervals are based on the size of the aneurysm:
  - Small: at 6 months. and then yearly
  - Medium: at 3, 6 and 12 months and then every 6-12 months
  - Large/Giant: at 3, 6, 9 and 12 months and then every 3-6 months

COVID-19 ~~(56)~~(49)

- Acute infection
  - Cardiopulmonary signs or symptoms (ECG abnormalities, elevated biomarkers, chest pain, dyspnea, syncope, palpitations)
- Post-Acute Sequelae (PASC) defined as new or returning cardiopulmonary symptoms 4 or more weeks and persisting more than 2 months following confirmed COVID infection, not explained by an alternative diagnosis (World Health Organization definition~~).~~)
- Post Vaccination
  - Symptoms or signs of myocarditis (ECG abnormalities, chest pain, elevated biomarkers)

Surveillance for Neuromuscular Disorders ~~(57)~~(50)

Asymptomatic surveillance intervals (genetically affected individuals with no signs or symptoms of cardiac involvement). Development of signs or symptoms of cardiac involvement necessitates more frequent assessment.

- Duchenne muscular dystrophy (DMD) and Becker muscular dystrophy (BMD)
  - age <10 years, TTE every 2 years
  - age 10 years or older, TTE annually
- Emery-Dreifuss muscular dystrophy (EDMD)
  - X-linked form: at least annual TTE
  - Autosomal form: TTE at initial diagnosis, surveillance TTE only if initial TTE abnormal
- Myofibrillar myopathy (MFM)
  - Annual TTE
- Barth (BTHS)-X linked recessive (only males develop disease)
  - Infant males TTE every 6 months
  - Age 1 year or older, annual TTE
- Limb-Girdle muscular dystrophy (LGMD)

- TTE may be performed annually
- Friedrich's ataxia (FA)
  - TTE can be performed at least annually
- Myotonic dystrophy (DM)
  - TTE every 2-4 years

Indications for Transthoracic Echocardiography (TTE) Pediatric Patients (Patients Under the Age of 18) ~~(34)~~(29)

- Hypertension (see section: **Hypertension (Pediatric)**) **(AUC Score 9)** ~~(34)~~(29)
  - Initial evaluation (one time only)
  - Persistent hypertension despite two or more medications can be performed annually ~~(33)~~(28)
- Initial evaluation of Renal failure **(AUC Score 7)** ~~(34)~~(29)
- Palpitations, if one:
  - Family history at age < 50 of either: **(AUC Score 7)** ~~(34)~~(29)
    - Sudden cardiac death/arrest **OR**
    - Pacemaker or ICD
  - History or family history of cardiomyopathy **(AUC Score 9)** ~~(34)~~(29)
- Chest pain, if one or more of the following:
  - Exertional chest pain **(AUC Score 8)** ~~(34)~~(29)
  - Abnormal ECG **(AUC Score 7)** ~~(34)~~(29)
  - Family history with unexplained sudden death or cardiomyopathy **(AUC 8)** ~~(34)~~(29)
- Syncope, if any of the following:
  - Abnormal ECG **(AUC Score 7)** ~~(34)~~(29)
  - Exertional syncope **(AUC Score 9)** ~~(34)~~(29)
  - Family history ~~at~~of one of the following before the age ~~<~~of 50 ~~of either one~~: **(AUC Score 9)** ~~(34)~~(29)
    - Sudden cardiac death/arrest ~~**OR**~~
    - Pacemaker or ICD
  - Family history of cardiomyopathy
- Signs and/or symptoms of heart failure, including, but not limited to: **(AUC Score 9)** ~~(34)~~(29)
  - Respiratory distress
  - Poor peripheral pulses
  - Feeding difficulty
  - Decreased urine output

- Edema
- Hepatomegaly

- Abnormal physical findings, including any one of the following:
  - Clicks, snaps, or gallops
  - Fixed and/or abnormally split S2
  - Decreased pulses
  - Central cyanosis **(AUC Score 8)** ~~(34)~~(29)
- Arrhythmia, if one of the following:
  - Supraventricular tachycardia **(AUC Score 7)** ~~(34)~~(29)
  - Ventricular tachycardia **(AUC Score 9)** ~~(34)~~(29)
- Murmur
  - Pathologic sounding or harsh murmur, diastolic murmur, holosystolic or continuous murmur, late systolic murmur, grade 3/6 systolic murmur or louder, or murmurs that are provoked and become louder with changes in position **(AUC Score 9)** ~~(34)~~(29)
  - Presumptively innocent murmur, but in the presence of signs, symptoms, or findings of cardiovascular disease **(AUC Score 7)** ~~(34)~~(29)
- Abnormal basic data, including any one of the following:
  - Abnormal ECG **(AUC Score 7)** ~~(34)~~(29)
  - Abnormal cardiac biomarkers **(AUC Score 9)** ~~(34)~~(29)
  - Desaturation on pulse oximetry **(AUC Score 9)** ~~(34)~~(29)
  - Abnormal chest x-ray **(AUC Score 9)** ~~(34)~~(29)
- Sickle cell **(AUC Score 8)** ~~(34)~~(29)
  - One time screening for risk stratification for pulmonary hypertension in children ≥ 8 years of age ~~(58)~~(51)
- Suspicion of Structural Disease, including any one of the following:
  - Premature birth where there is suspicion of a Patent Ductus Arteriosus
  - Vascular Ring, based upon either one:
    - Difficulty breathing with stridor and eating solid foods that might suggest a vascular ring.
    - Abnormal barium swallow or bronchoscopy suggesting a vascular ring **(AUC Score 7)** ~~(34)~~(29)
- Genetic & Syndrome Related, including any one of the following: **(AUC Score 7)** ~~(34)~~(29)
  - Genotype positive for cardiomyopathy, family history of hypertrophic cardiomyopathy or heritable pulmonary arterial hypertension
  - Patient with a known syndrome associated with congenital or acquired heart disease (Down's syndrome, Noonan's syndrome, DiGeorge syndrome, William's syndrome, Trisomy Thirteen, Trisomy Eighteen, Alagille syndrome, chromosomal

abnormality associated with cardiovascular disease)

- Abnormalities of visceral or cardiac situs
- Known or suspected connective tissue diseases that are associated with congenital or acquired heart disease. (e.g., Marfan's, Loeys-Dietz)
- Patients with a first-degree relative with a genetic abnormality, such as cardiomyopathies (hypertrophic, dilated, arrhythmogenic right ventricular dysplasia, restrictive, left ventricular noncompaction).

- Maternal-Fetal related, including any one of the following:
  - Maternal infection during pregnancy or delivery with potential fetal/neonatal cardiac sequelae **(AUC Score 7)** ~~(34)~~(29)
  - Maternal phenylketonuria **(AUC Score 7)** ~~(34)~~(29)
  - Suspected cardiovascular abnormality on fetal echocardiogram **(AUC Score 9)** ~~(34)~~(29)

Congenital Heart Disease Follow-Up‡* (22)

Adult and Pediatric

[‡All surgical or catheter-based repairs allow evaluation PRIOR to the procedure and POSTPROCEDURAL evaluation (within 30 days)]

- For all lesions, TTE is indicated for change in clinical status and/or development of new signs or symptoms
- Infant with any degree of unrepaired valvular AS/AR may have surveillance TTE every 1 – 4 weeks as needed
- Surveillance interval for patients with subvalvular stenosis **plus** aortic regurgitation will be dictated by the magnitude of the more significant abnormality (e.g., mild stenosis with moderate regurgitation would have surveillance interval as though stenosis were also moderate~~).~~)
- Infant with any degree of unrepaired MS may have surveillance TTE every 1 – 4 weeks as needed
- After any surgical or catheter-based repair, evaluation (3-12 months) for a patient with heart failure symptoms
- Annual surveillance in a child with normal prosthetic mitral valve function and no LV dysfunction
- Surveillance (3-12 months) in a child with prosthetic mitral valve and ventricular dysfunction and/or arrhythmia
- Annual surveillance for incomplete or palliative repair (including but not limited to Glenn shunt, Fontan procedure and RV-PA conduit)
- TTE may be unnecessary in a year when cardiac MRI is performed unless clinical indication warrants otherwise.

[*Note: See tables below for specific surveillance intervals~~.~~]]

Infancy is defined as between birth and 2 years of age; childhood from 2-12 years of age; and adolescence from 12 to 21 years of age ~~(59)~~(52)

Table 1: Unrepaired Lesion Follow-Up‡ (22)

‡~~Blue~~ Gray shading indicates lifetime surveillance interval

Unrepaired Lesion	Surveillance Intervals				
	1-3 months	**3-6 months**	**6-12 months**	**1-2 years**	**3-5 years**
Aortic Stenosis (AS) and/or aortic regurgitation (AR) (See **section above** for surveillance intervals for infants)			Child Asymptomatic ≥ moderate AS/AR	Child Asymptomatic mild AS/AR	
Bicuspid aortic valve with ≤ mild AS/AR and no aortic dilation in a child				For adolescent	**3 Years**
Atrial septal defect				**Moderate size (6-12mm)**	**Small size (3-6mm)**
Double outlet right ventricular (DORV): with balanced systemic and pulmonary circulation	Infant	Child			
Mitral regurgitation (MR)	Infant with ≥ moderate MR		Infant with mild MR. Child with ≥ moderate MR.		Child with mild MR (2-5 years)
Mitral Stenosis (MS) (See **section above** for surveillance intervals for infants)		Child with ≥ moderate MS		Child with mild MS	

Unrepaired Lesion	Surveillance Intervals				
	1-3 months	**3-6 months**	**6-12 months**	**1-2 years**	**3-5 years**
Congenitally corrected transposition of the Great Arteries (ccTGA)		Infant	**Moderate or greater A-V valve regurgitation**	**< Moderate A-V valve regurgitation**	
Tricuspid regurgitation (TR)		Infant with ≥ moderate TR	Child with ≥ moderate TR	Child with mild TR	
Patent Ductus Arteriosus		Infant		Child	**Adult**
Pulmonary stenosis (PS)		Infant		Child	
				Adult	
Coarctation		Infant		Child	
				Adult	
Ventricular septal defect (VSD)	Infant with ≥ moderate VSD			Child with non-muscular VSD	Child with small muscular VSD
					Adult with any VSD
Anomalous coronary arteries				**Moderate to large coronary fistula**	**Small coronary fistula or RCA arising from left coronary sinus (2-5 years)**
Subvalvular AS See **section above** for	Infant with any degree of stenosis		Child with ≥ moderate stenosis	Child with mild stenosis	

Unrepaired Lesion	Surveillance Intervals				
	1-3 months	**3-6 months**	**6-12 months**	**1-2 years**	**3-5 years**
information on surveillance intervals for stenosis **plus** regurgitation			**Adult with ≥ moderate stenosis**	**Adult with mild stenosis**	
Supravalvular AS		Infant with any degree of stenosis	Child with ≥ moderate stenosis	Child with mild stenosis	**2-5 years** **Adult with ≥ moderate stenosis**
			Adult with ≥ moderate stenosis	**Adult with mild stenosis**	
Total anomalous pulmonary venous connection (TAPVC)	Prior to planned repair or for change in clinical status and/or development of new signs and symptoms				

Note: Despite surgical or catheter-based procedures, most patients with congenital heart disease are left with disorders or **sequelae** that are known consequences of the reparative intervention. These disorders can include arrhythmias, valvular and myocardial dysfunction, and vascular and non-cardiovascular abnormalities. These sequelae can be categorized as mild, moderate, or severe. Use clinical judgement to assess the nature of the sequelae when adjudicating cases based on the follow-up criteria below.

Table 2: Postprocedural Follow-Up‡ (22)

‡~~Blue~~Gray shading indicates lifetime surveillance interval

Post-procedure: Surgical or Catheter-Based	Surveillance Intervals				
	1-3 months	**3-6 months**	**6-12 months**	**1-2 years**	**3-5 years**
Post-procedural treatment of AS or AR with repair or replacement	Infant with ≥ moderate AS or AR or LV dysfunction	Infant with ≤ mild AS or AR and no LV dysfunction	Child with ≥ moderate AS or AR	Child with ≤ mild AS or AR	
ASD device closure: no or mild sequelae	Within 1st year	Within 1st year	At 1 year		**2-5 years**

Post-procedure: Surgical or Catheter-Based	Surveillance Intervals				
	1-3 months	**3-6 months**	**6-12 months**	**1-2 years**	**3-5 years**
ASD surgical repair: no or mild sequelae			Within 1st year		**2-5 years**
ASD: **device closure or surgical repair with residual shunt, valvular or ventricular dysfunction, arrhythmias, or pulmonary hypertension**		**3-12 months**			
DORV: no or mild sequelae			Within 1st year	**1-2 Years**	
DORV: valvular or ventricular dysfunction, outflow obstruction, arrythmias, branch pulmonary artery stenosis, presence of **RV-PA conduit**		**3-12 months**			
Tricuspid valve surgery or catheter-based procedure: **no or mild sequelae**				**1-2 years**	
Tricuspid valve surgery or catheter-based procedure: valvular or ventricular dysfunction or arrhythmias			Child	**Adult**	
Pulmonary Stenosis: **no or mild sequelae**			Child with moderate or severe sequelae	Child with no or mild sequelae	**Adult**
Coarctation: **no or mild sequelae**		Within 1st year		**After 1st year**	

Post-procedure: Surgical or Catheter-Based	Surveillance Intervals				
	1-3 months	**3-6 months**	**6-12 months**	**1-2 years**	**3-5 years**
PDA: **no or mild sequelae**				Annually within 1st two years	**Five years after 1st two years***
PDA: **post-procedural left PA stenosis or aortic obstruction**				**1-2 years**	
Tetralogy of Fallot (ToF): after transcatheter pulmonary valve replacement, with no or mild sequelae	1 month	6 months		**Annually**	
ToF: **patient with conduit dysfunction valvular or ventricular dysfunction, pulmonary artery stenosis, or arrhythmias**			**6-12 months**		
Congenitally corrected transposition on the Great Arteries (ccTGA): **no or mild sequelae**		Within 1st year		**1-2 years**	
ccTGA: **valvular or ventricular dysfunction, outflow obstruction, ventricular - PA conduit**		**3-12 months**			
d-TGA: **no or mild sequelae**	Infant with moderate sequelae	Within 1st year		**1-2 years**	

Post-procedure: Surgical or Catheter-Based	Surveillance Intervals				
	1-3 months	3-6 months	6-12 months	1-2 years	3-5 years
d-TGA: moderate or greater valvular or ventricular dysfunction, outflow obstruction, branch pulmonary artery stenosis or arrhythmias, presence of **RV-PA conduit**		**3-12 months**			
d-TGA: **dilated neoaortic root and increasing Z-Score or neoaortic regurgitation**				**1-2 years**	
Truncus Arteriosus (TA): no or mild sequelae	Within 1st year		**After 1st year**		
TA: **moderate or greater truncal stenosis / regurgitation**		**3-6 months**			
TA: **residual VSD, RV-PA conduit, branch pulmonary artery obstruction**		**3-12 months**			
VSD: **no or mild sequelae or small residual shunt**			Within 1st year		**2-3 years**
VSD: **significant residual shunt, valvular or ventricular dysfunction, arrhythmias, or**		**3-12 months**			

Post-procedure: Surgical or Catheter-Based	Surveillance Intervals				
	1-3 months	**3-6 months**	**6-12 months**	**1-2 years**	**3-5 years**
pulmonary hypertension					
Anomalous coronary arteries	Within 1st year	Infant with or without ventricular or valvular dysfunction Child or adult with ventricular or valvular dysfunction		**Annually**	
Subvalvular AS See **section above** for information on surveillance intervals **plus** regurgitation	Infant with ≥ moderate stenosis	Infant with ≤ mild stenosis		Child with ≤ mild stenosis and/or AR **Adult with ≤ mild stenosis and/or AR**	
Subvalvular AS *continued*		3-12 months Child ≥ moderate stenosis **3-12 months** **Adult ≥ moderate stenosis**			
Supravalvular AS			**Patient with ≥ moderate stenosis**		**2-5 years** **Patient with ≤ mild stenosis**
Total anomalous pulmonary venous connection		Infant with mild or no sequelae		Child with mild or no sequelae	**Adult with mild or no sequelae**

***PDA lifetime surveillance applies only to device closure; PDA lifetime surveillance is not indicated for surgical closure.**

CODING AND STANDARDS

~~Coding~~

~~CPT~~ Codes

93303, 93304, 93306, 93307, 93308, +93320, +93321, +93325, +93356, 96374

Applicable Lines of Business

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

BACKGROUND

AUC Score

A reasonable diagnostic or therapeutic procedure ~~care~~ can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. (3)

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

Acronyms / Abbreviations

AS: Aortic stenosis

AR: Aortic regurgitation

ASD: Atrial septal defect

BNP: B-type natriuretic peptide or brain natriuretic peptide

CABG: Coronary artery bypass grafting surgery

CAD: Coronary artery disease

ccTGA: Congenitally corrected transposition of the Great Arteries

CMR: Cardiovascular magnetic resonance

CRT: Cardiac resynchronization therapy

CT: Computed tomography

CVA: Cerebrovascular accident

DORV: Double outlet right ventricle

d-TGA: D-Transposition of the Great Arteries

ECG: Electrocardiogram

EF: Ejection fraction

HCM: Hypertrophic cardiomyopathy

HTN: Hypertension

HF: Heart failure

ICD: Implantable cardioverter-defibrillator

LAA: Left atrial appendage

LV: Left ventricular/ventricle

LVEF: Left ventricular ejection fraction

LVH: Left ventricular hypertrophy

MI: Myocardial infarction

MR: Mitral regurgitation

MS: Mitral stenosis

PA: Pulmonary artery

PAC: Premature atrial complex

PDA: Patent ductus arteriosus

PFO: Patent foramen ovale

PMVR: Percutaneous Mitral Valve Repair

PS: Pulmonary stenosis

PVC: Premature ventricular contraction

RV: Right ventricular/ventricle

TA: Truncus arteriosus

TAVR: Transcatheter aortic valve replacement

TEE: Transesophageal echocardiogram

TIA: Transient ischemic attack

ToF: Tetralogy of Fallot

TR: Tricuspid regurgitation

TTE: Transthoracic echocardiogram

VAD: Ventricular assist device

VF: Ventricular fibrillation

VSD: Ventricular septal defect

VT: Ventricular tachycardia

SUMMARY OF EVIDENCE

ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 Appropriate Use Criteria for Echocardiography [6]

Study Design: The study is a comprehensive report by the American College of Cardiology Appropriate Use Criteria Task Force, along with several other cardiovascular societies. It focuses on multimodality imaging in valvular heart disease, providing appropriate use criteria (AUC) for various imaging modalities.

Target Population: The target population includes patients with valvular heart disease, ranging from asymptomatic individuals at risk to those with severe symptomatic conditions. The study covers initial evaluations, follow-up testing, and imaging for surgical and transcatheter interventions.

Key Factors: The study outlines criteria for using imaging modalities like transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), cardiac computed tomography (CCT), and cardiovascular magnetic resonance imaging (CMR) for initial evaluations of valvular heart disease. It provides guidelines for sequential or follow-up testing in asymptomatic or stable patients, as well as those with new or worsening symptoms. The study includes criteria for imaging before, during, and after procedures like transcatheter aortic valve replacement (TAVR) and percutaneous mitral valve repair.

ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2019 Appropriate Use Criteria for Multimodality Imaging in the Assessment of Cardiac Structure and Function in Nonvalvular Heart Disease [7]

Study Design: This document is the second of two companion AUC documents, focusing on multimodality imaging in the assessment of cardiac structure and function in nonvalvular heart disease.

Target Population: The target population includes patients with structural heart disease, excluding valvular diseases. This encompasses conditions like heart failure, diseases of the aorta and pericardium, and congenital heart disease.

Key Factors: Initial Evaluation: Criteria for using imaging modalities like TTE, TEE, CMR, and CT for initial evaluations of cardiac structure and function. Guidelines for sequential or follow-up testing to clarify initial diagnostic testing, assess stability in asymptomatic patients, and evaluate new or worsening symptoms. Criteria for imaging support in procedures like patent foramen ovale closure and left atrial appendage occlusion.

ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2017 Appropriate Use Criteria for Multimodality Imaging in Valvular Heart Disease [9]

Study Design: This document presents the 2017 Appropriate Use Criteria (AUC) for multimodality imaging in valvular heart disease. It was developed by the American College of Cardiology and other related societies.

Target Population: Patients with valvular heart disease, including those undergoing initial evaluation, follow-up, and pre- and post-procedural assessments.

Key Factors: The document outlines various clinical scenarios and provides recommendations for the use of different imaging modalities such as transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), cardiac computed tomography (CCT), and cardiovascular magnetic resonance imaging (CMR). The primary

objective is to standardize physician decision-making and improve patient care by providing a comprehensive resource for multimodality imaging.

ANALYSIS OF EVIDENCE

Analysis [6,7,9]:

In summary, while all three articles highlight the importance of TTE in the evaluation and management of cardiac conditions, they differ in their specific focus and scope. "Doherty et al 2017" focuses on valvular heart disease, "Doherty et al 2019" expands to nonvalvular heart disease, and "Douglas et al 2011" provides a comprehensive overview of the appropriate use of echocardiography. Each article provides valuable insights into the role of TTE in different clinical scenarios, emphasizing its importance in initial evaluation, guiding therapy, and ongoing management.

Shared Conclusions

- **Importance of TTE in Initial Evaluation**: All three articles emphasize the critical role of TTE in the initial evaluation of various cardiac conditions. TTE is considered appropriate for assessing symptoms potentially related to cardiac etiology, such as chest pain, shortness of breath, and palpitations. It is also used for evaluating suspected valvular heart disease, heart failure, and cardiomyopathies.
- **Guidance for Therapy and Management**: TTE is consistently highlighted as a valuable tool for guiding therapy and management decisions. This includes evaluating ventricular function, assessing the severity of valvular disease, and monitoring the effectiveness of treatments.

Follow-Up and Surveillance: The articles agree on the importance of TTE for follow-up and surveillance in patients with known cardiac conditions. Regular TTE assessments are recommended to monitor disease progression and guide ongoing management.

POLICY HISTORY

~~*Summary*~~

Date	Summary
~~June 2024~~	~~• Added AUC Scoring to Cardiac Guidelines from published Societies. When an AUC score was not published by a Society, we assigned an AUC score of 6 based upon AUC scoring standards – this has been explained in Clinical Reasoning~~ ~~• Pediatric hypertension: Re-evaluation of patients' w/o LVH on initial evaluation can have TTE annually is new along with the criteria (state 2 HTN, secondary HTN, and chronic stage 1 HTN)~~ ~~• Under Prosthetic Valves/Native Valve Repair, the first bullet, "yearly thereafter" was removed because each bullet below has its own "year(s)" surveillance~~

~~April 2023~~July 2025	~~• Expanded and clarified indications based upon ECG abnormalities~~ ~~• Clarified arrhythmias (premature atrial complexes (PAC)) which do not meet criteria for approval.~~ ~~• Expanded and clarified surveillance imaging criteria for thoracic aortic aneurysm in Turner's syndrome~~ ~~• Added Takotsubo cardiomyopathy to section on surveillance for cardiomyopathy with recovered left ventricular ejection fraction~~ ~~• Expanded indication for screening in suspected cardiac sarcoidosis~~ ~~• Expanded section on post heart transplant surveillance~~ ~~• Added screening in children with sickle cell disease~~ ~~• Expanded section on aortopathic syndromes, cardiovascular disease in pregnancy~~ ~~• Clarified syncope indications~~ ~~• Pulmonary hypertension: added section for annual screening in certain diseases, added indication for repeat following pulmonary embolism evaluate for chronic thromboembolic pulmonary hypertension~~ ~~• Cardiomyopathy: added examples of infiltrative processes, added intervals for repeat testing in different forms of amyloidosis~~ ~~• Added indication for surveillance following radiation therapy~~ ~~• Hypertrophic cardiomyopathy: added statement on imaging related to Camzyos therapy~~ ~~• Clarified surveillance related to exposure to cardiotoxic medication~~ ~~• Added section on COVID~~ ~~• Added section on inflammatory and autoimmune diseases~~ ~~• Added section on neuromuscular disorders~~ ~~• Reorganized Pediatric section for clarity~~ ~~• Added sections on supravalvular and subvalvular AS and total anomalous pulmonary venous connection to congenital heart disease table~~ • ~~Added statement on clinical indications not addressed in this guideline~~This guideline merges and replaces two Evolent guidelines with identical clinical criteria: ECG 7337-01 for Transthoracic Echocardiogram and ECG 067 for Transthoracic Echocardiogram into Evolent Clinical Guideline 7337 for Transthoracic Echocardiogram (TTE) ○ This guideline also merges Procedure Codes from these two Evolent guidelines • Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices

	• Updated/added AUC scores
	• Arrythmias: added isolated PAC not indicated for TTE
	• Prosthetic/Native Valves Repair:
	  ○ Surgical mechanical valve: changed to every three years post implantation
	  ○ Surgical mitral valve repair: changed to every three years post repair
	• Applicable Line of Business adjusted – Medicare checked
	• Added a Summary of Evidence and Analysis of Evidence

January 2025	• Corrected CPT code typo
November 2024	• This guideline replaces UM 1121 Transthoracic Echocardiography • Simplified surveillance schedule ranges

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent

Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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