



UM-CDG-026 Transthoracic Echocardiography

Approved By:  
Director, Health Services

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***This Policy applies to all SECUR affiliates, associates, and subsidiaries.***

Approved by Courtney Gonzales, Director of Health Services on behalf of the Utilization Management Committee.

## PURPOSE

This coverage determination guideline serves to address transthoracic echocardiography (TTE), ultrasonic examination of the heart through the chest wall. Two-dimensional (2D) TTE may allow visualization of the cardiac chambers, cyclic variation in myocardial wall thickness, valvular structure and function, the proximal great vessels and the pericardium.

Doppler flow evaluation uses the changes in frequency when a transmitted ultrasound wave is reflected from moving surfaces (e.g., heart valves, red blood cells) and allows measurement of blood flow velocity which can be used to identify valvular stenosis or regurgitation, estimate cardiac output and intracardiac pressures, or identify the presence of intracardiac shunts.

In order to qualify as a valid echocardiographic service, the study must be done for an accepted clinical indication by a properly trained examiner and must include a permanent record of the findings, data sufficient to support the conclusions, and an appropriate interpretation and written report. Such a study would meet the standards required for a complete echocardiographic examination, regardless of the size or portability of the instrument used to perform the study.

This coverage determination guideline addresses the medically necessary and appropriate application of TTE, including stress echocardiography.

For SECUR Health Plan members, National Coverage Determinations (NCD) and Local Coverage Determinations (LCD) will be applied to requests when applicable. SECUR Health Plan Coverage Determination Guidelines (CDG) will be utilized in the absence of an appropriate NCD and/or LCD.

## DEFINITIONS

None

## POLICY

SECUR Health Plan considers TTE as medically necessary in the evaluation of derangements of valvular, myocardial, and pericardial structure and function under the following circumstances and conditions:

Transthoracic Echocardiogram  
Ventricular Function, Cardiomyopathies and Heart Failure

1. When the etiology is in doubt, echocardiography can document or rule out the common cardiac causes of

pulmonary congestion, left-sided valvular disease, depressed systolic or diastolic function, and cardiomyopathy. In this regard, echocardiography is the preferred initial diagnostic test when the history, physical examination, and routine laboratory tests suggest (or cannot eliminate) cardiac disease

2. Echocardiography is recommended for members with edema with clinical signs of elevated central venous pressure when a potential cardiac etiology is suspected or when central venous pressure cannot be estimated with confidence and clinical suspicion of heart disease is high. TTE is also recommended for members experiencing dyspnea with clinical signs of heart disease.
3. Echocardiography is not recommended in members with edema when the jugular venous pressure does not appear to be elevated.

#### Hypertensive Cardiovascular Disease

1. Evaluating the cardiac effects of systemic hypertension.
2. In young individuals and in individuals with borderline hypertension, the decision to commit to long-term antihypertensive therapy may be determined by the presence of left ventricular hypertrophy and /or left ventricular mass calculation.

#### Acute Myocardial Infarction and Coronary Insufficiency

1. Evaluation of regional motion, systolic thickening perturbations and mural thinning
2. Evaluation of right ventricular ischemia and/or infarction
3. Diagnosis or evaluation of complications of acute infarction (e.g., mural thrombi, papillary muscle dysfunction and rupture, septal defects, true or false aneurysm and myocardial rupture)
4. Following an initial TTE in the setting of acute infarction, repetition frequency will typically be dictated by the acute clinical course. The medical record should document the medical necessity of the frequency for TTE assessment.
5. Evaluation of chest pain in members with suspected acute myocardial ischemia, when baseline ECG and other laboratory markers are nondiagnostic and when study can be obtained during pain or within minutes after its abatement.
6. Diagnosis of acute myocardial infarction when the clinical history and ECG findings are nondiagnostic.

#### Exposure to Cardiotoxic Agents (chemotherapeutic and external)

An initial complete TTE may be performed prior to first administration of the agent with the frequency of repeat studies determined by the member's clinical course and the toxicity profile of the agent being administered, although tests performed bimonthly during chemotherapy and at six (6) months following therapy are generally considered medically appropriate.

#### Cardiac Transplant and Rejection Monitoring

1. TTE is an integral part of the cardiac donor-selection and donor-recipient matching process. Evaluation focuses on analysis of ventricular function and valvular integrity.
2. TTE in the management of allograft recipients is typically performed weekly for the first four to eight (4-8) weeks following transplant, with reduced frequency over time. Absent acute rejection episodes, approximately two (2) TTE examinations are typically performed yearly in chronic transplant recipients. TTE of cardiac allografts is most appropriately serially performed at transplant centers by examiners with expertise in the management of cardiac allograft recipients. Uses more than the generally accepted frequency will be expected to have appropriate medical necessity documentation provided.

#### Native Valvular Heart Disease

1. TTE is well established as a technique of primary choice for the evaluation of valvular pathology and its effect upon global myocardial function.

2. In some members, Doppler echocardiography is the only noninvasive method capable of identifying the cause of a heart murmur.
3. Absent acute intervention, or a discrete change in otherwise stable clinical signs and symptoms, it is not medically necessary to repeat these examinations more frequently than annually. When the member's clinical status shows evidence of change or the plan of care includes consideration for imminent valvular surgery, more frequent exams may be necessary.

#### Prosthetic Heart Valves (Mechanical & Bio-prostheses)

TTE assessment after prosthetic valve implant to establish a baseline structural and hemodynamic profile with reassessment following convalescence (3-6 months). Thereafter, re-evaluation of members with suspected dysfunction, thrombosis or a change in clinical status or symptoms is indicated.

#### Acute Endocarditis

1. Diagnostic and evaluation of suspected endocarditis or complications or sequelae of acute infective endocarditis.
2. Examination frequency in the acute phase of illness is dictated by the individual clinical course. When the acute process has been stabilized, the frequency of serial TTE evaluation will be determined by the residual pathophysiology and discrete clinical events, analogous to the serial assessment of chronic valvular dysfunction and/or normally functioning prosthetic valves.

#### Pericardial Disease

1. Detection and quantitation of the amount of pericardial effusion.
2. To characterize the hemodynamic consequences of pericardial fluid accumulation.
3. As an adjunct during the removal of pericardial fluid and creation of pericardial windows.
4. Diagnosis of pericardial constriction and differentiating it from restrictive myocardial disease (may require Doppler).
5. The acute clinical status will dictate examination frequency. In a member with evolving pericardial pathology, a limited focused TTE exam may be appropriate.

#### Abnormalities of the Great Vessels

1. Evaluation of acute or chronic aortic pathology (Note: TEE is often a more determinative study unless images suitable for serial quantitation can be obtained by TTE).
2. Routine (yearly) evaluation is indicated in members with severe aortic stenosis or regurgitation, in whom the information obtained will be used in determining or modifying the plan of care.
3. With ascending aortic dilatation or aneurysms, a focused limited follow-up exam to serially measure ascending aortic diameters may be indicated.
4. Evaluation of the main pulmonary artery segment and the proximal right and left pulmonary arteries.
5. Evaluation of the vena cavae and diagnosing congenital and acquired abnormalities such as vena caval thrombosis, vena caval dilation, and thrombosis or extension of tumors from the inferior vena cava to the right-heart chambers.

#### Congenital Heart Disease

1. TTE with Doppler hemodynamic measurements for diagnosis and noninvasive serial assessment of most congenital heart diseases.
2. When the disease process and therapy are stable, assessment more often than annually requires medical necessity documentation.
3. In asymptomatic members following repair of ASD, PFO, VSD or PDA follow up examination is only indicated within the first year after correction.

### Suspected Cardiac Thrombi and Embolic Sources

TTE is indicated for the evaluation for cardiovascular source of embolic events (PFO/ASD, atrial or ventricular thrombus, intracardiac tumor) in evaluation for members with abrupt occlusion of a major peripheral or visceral artery or for with neurological events without evidence of cerebrovascular disease or other obvious cause.

### Cardiac Tumors and Masses

1. Diagnosis and assessment of cardiac tumors.
2. Serial TTEs may be medically necessary to monitor tumor size or tumor recurrence.

### Critically Ill and Trauma Members

1. Diagnosis of suspect aortic or central pulmonary pathology, cardiac contusion, or pericardial effusion.
2. Assessment of volume status.
3. The frequency of these typically acute studies will be dictated by the clinical circumstances.

### Arrhythmias and Palpitations

1. Transthoracic echocardiography is useful in defining cardiac function in which arrhythmias occur and may be useful in the management of cardiac arrhythmias. Some arrhythmias are frequently associated with underlying organic heart disease or may predispose the member to hemodynamic deterioration. Atrial fibrillation and atrial flutter are examples of arrhythmias in which echocardiography may be appropriate to assess the underlying disorder. Echocardiographic studies are appropriate only when there is evidence of heart disease.
2. Palpitations without evidence of arrhythmias, or minor arrhythmias (e.g., isolated APC's or VPC's) without evidence of heart disease, are not covered indications for transthoracic echocardiography.

### Syncope

In the initial evaluation of syncope and when other findings are suggestive of valvular heart disease or obstructive cardiomyopathy.

### Pulmonary

To assess right ventricular size and performance and quantify the severity of pulmonary hypertension using Doppler flow in unexplained pulmonary hypertension, and pulmonary emboli with suspected right atrial or right ventricular sources of emboli.

### Contrast Echocardiography

Contrast echocardiography is indicated when a conventional study has failed to provide adequate and critically needed information on left ventricular function. A contrast agent is considered medically necessary when it is used to improve the delineation of the left ventricular endocardial borders in a member whose non-contrast study is inadequate or suboptimal, and for whom the LV function information is essential to the management of the member. Contrast is indicated when more than two (2) contiguous segments of the left ventricular border are not visualized.

SECUR Health Plan considers the following as not medically necessary:

1. Echocardiography performed for screening purposes
2. Routine (yearly) evaluation of asymptomatic members with corrected ASD, VSD or PDA more than one year after successful correction.
3. Routine (yearly) re-evaluation of mitral valve prolapse in members with no or mild mitral regurgitation and no change in clinical status.

4. Routine (yearly) re-evaluation of an asymptomatic member with mild native aortic stenosis or mild-moderate native mitral stenosis and no change in clinical status.
5. Routine (yearly) re-evaluation of native valvular regurgitation in an asymptomatic member with mild regurgitation, no change in clinical status and normal left ventricular size.
6. Routine (yearly) evaluation of a member with a prosthetic valve in whom there is no suspicion of valvular dysfunction and no change in clinical status.
7. Routine (yearly) re-evaluation of members with heart failure (systolic or diastolic) in whom there is no change in clinical status.
8. Routine (yearly) evaluation of hypertrophic cardiomyopathy in a member with no change in clinical status.
9. Members who have isolated APC or VPC without other evidence of heart disease.
10. Evaluation of LV function with prior ventricular function within the past year with normal (such as prior echocardiogram, left ventriculogram, SPECT, cardiac MRI) in members in whom there has been no change in clinical status.
11. Initial evaluation of member with suspected pulmonary embolism to establish diagnosis.
12. Evaluation of native and/or prosthetic valves in members with transient fever but without evidence of bacteremia or new murmur.
13. Re-evaluation of a member with known hypertensive heart disease without a change in clinical status.
14. Routine evaluation of members with systemic hypertension without suspected hypertensive heart disease.
15. Evaluation of a member with atrial fibrillation/flutter for left atrial thrombus or spontaneous contrast when a decision has been made to anticoagulate and not to perform cardioversion.

#### Follow Up or Limited Studies

A complete study includes a full evaluation of all aspects of the heart, including the cardiac chambers, valves, blood flow, and great vessels. The images are reviewed, measured, analyzed and interpreted by the physician. A report is prepared for the member's record. When a less than complete examination is performed for the purpose of evaluation of one specific cardiac problem, or region of the heart, the service performed is reported as follow-up or limited studies. When a limited service is performed, or the member's condition requires only a limited examination, these codes must be used to indicate the appropriate service.

Examples of appropriate use of a follow-up study of a member with pericardial effusion following heart surgery, to evaluate progression or resolution of the effusion; or a serial evaluation of left ventricular function during antineoplastic chemotherapy.

Examples of appropriate use of recording tricuspid regurgitant velocity in order to estimate pulmonary artery systolic pressure; or sequential evaluation of the transmitral velocity profile in a member with mitral stenosis, in order to evaluate for a change in gradient or valve area.

Spectral Doppler echocardiography and Doppler color flow-velocity mapping may be necessary in addition to an echocardiogram when the examination could contribute significant information to the member's condition or treatment plan. Typically, Doppler is indicated in the evaluation of some heart murmurs, valvular problems, shunts, suspected congenital heart disease, complications of myocardial infarction, or cardiomyopathy. Doppler should be medically necessary for the evaluation and management of the member.

"Color/spectral Doppler may not be useful or appropriate in certain relatively small and well-defined member populations when there is a recent comprehensive examination, and the test is being ordered for re-evaluation of a limited problem." (ASE comment).

The use of the Doppler is inherent in the ultrasonic cardiac evaluation. However, if the test reports fail to document the use of this technique to assess these structures and function (e.g., measurement of valvular insufficiency or stenosis, myocardial diastolic function, etc. as described by the ASE), or if the medical records fail to document that the examination was "clinically necessary" (e.g., follow-up of pericardial effusion size) then the Doppler portion of the test will be considered medically unnecessary and denied.

Some small scanners have more limited capabilities and lack either the permanent recording capabilities or some of the functional capabilities needed to perform a complete examination. Such a study may be quite useful as an extension of the physical examination. However, an examination that does not meet the standards required for a complete diagnostic echocardiographic examination – whether performed with a "conventional" scanner or a limited capability ultrasound scanner - will not be recognized as a valid echocardiographic service and will be considered not medically necessary.

### Stress Echocardiography

Stress echocardiography may be necessary when the evaluation could contribute significant information to the member's condition or treatment plan. A nonimaging stress test focuses on the hemodynamic and electrocardiographic responses to stress. To enhance the diagnostic specificity, the stress test may be combined with echocardiographic imaging or scintigraphic imaging. A contrast agent may be used with echocardiographic imaging to enhance endocardial visualization and diagnostic accuracy. When two (or more) imaging studies (e.g., ultrasound and scintigraphy) are billed without a supporting clinical indication for each, one of the services will be denied as not medically necessary.

Stress echocardiography will be considered medically necessary for the care of members with real or suspected ischemic heart disease in the following:

1. To detect coronary artery disease in patients presenting with chest pains including atypical chest pains and exertional dyspnea when the suspicion of CAD is high.
2. To assess prognosis and functional capacity in patients following an acute myocardial infarction.
3. To evaluate the extent of exercise induced ischemia in patients who have had a revascularization procedure (PCTA, stent or coronary bypass) or patients who have known CAD disease.
4. In women, stress imaging has been recommended as the "initial test."
5. To evaluate a prior nondiagnostic or abnormal ECG exercise test as a substitute for a nuclear perfusion study.
6. To evaluate patients who are at high risk for myocardial infarction prior to a scheduled major surgical procedure (e.g., aneurysm, vascular surgery, surgeries with large volume shifts, etc) or transplant procedure.
7. To evaluate patients presenting with various arrhythmias (atrial and/or ventricular) or syncope (near or pre), when the suspicion of occult coronary artery disease is high.
8. To evaluate patients when an indicated standard exercise ECG is likely to be non-diagnostic, including patients with an abnormal resting ECG, orthostatic or hyperventilation induced ECG changes, nonspecific ST-T abnormalities due to ventricular hypertrophy drugs or associated intraventricular conduction defect.
9. To assess myocardial viability (hibernating myocardium) for planned revascularization or functional significance of coronary lesions (if not already known) in planning percutaneous transluminal coronary angioplasty.
10. To evaluate cardiomyopathy when the evaluation could reasonably be expected to contribute significant information regarding the patient's condition or treatment plan.
11. To evaluate ventricular dysfunction due to post-transplant rejection when the evaluation could reasonably be expected to contribute significant information regarding the patient's condition or treatment plan.
12. To evaluate congenital heart disease, when stress echocardiography helps to determine systemic and right

ventricular function at rest and following stress and the presence of any other structural abnormalities, including valvular lesions that may be accentuated with stress.

13. Additionally, the test may be combined with Doppler intervention to evaluate exercise hemodynamics in patients with mitral stenosis, mitral regurgitation, pulmonary hypertension, aortic stenosis/regurgitation, prosthetic valves and other conditions where symptoms suggest a more severe impairment than the assessment done at rest.
14. Dobutamine stress echo may be indicated to detect low gradient, low output (aortic stenosis) or clinically silent transplant coronary disease.

Stress echocardiography used as a screening test for ischemic heart disease in a member without signs or symptoms is considered not medically necessary.

Additionally, the following will be considered when making a medical necessity determination:

1. An echocardiographic study is performed when the pathology and/or systolic ventricular function have been adequately defined by other techniques, making the echocardiographic study redundant will not be considered medically necessary.
2. Since echocardiography, nuclear testing, magnetic resonance imaging (MRI), and positron emission tomography can yield overlapping if not identical information, often with similar or comparable accuracy, when two or more of these tests provide equivalent information, one (but not both/all) will be covered when medically necessary.
3. Stress tests by multiple modalities (e.g. stress echocardiography, nuclear SPECT) for the same clinical event are covered only if the preceding test was inconclusive or uninterpretable.
4. Studies with or without contrast will be considered a single study, whether performed on the same or subsequent days.
5. Contrast echocardiography is not medically necessary when used to evaluate perfusion. Contrast is not indicated unless more than two (2) contiguous segments of the left ventricular border are not visualized.
6. A stress test must be ordered by a physician or qualified non-physician provider.

### Three-Dimensional Echocardiography

Three-dimensional echocardiography performed in conjunction with transthoracic echocardiography is indicated for:

1. Pre-operative planning in patients who will be having surgery to repair mitral valve prolapse (in addition to a diagnosis for a pre-operative examination, a secondary diagnosis of mitral valve prolapse is required on the claim).
2. Monitoring the mitral valve area in patients with moderate to severe mitral stenosis.

Three-dimensional echocardiography provides improved calculation of volumetric studies when compared to 2D echocardiography. However, its value in affecting clinical outcomes is not yet proven and is therefore not considered medically necessary.

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