



PHYSICIAN GUIDELINES

Current, Evidence-based
Recommendations Regarding Cardiology

Effective March 17, 2017

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I. Pacemaker ^{1, 2} [One]**A. Sinus Node Dysfunction [One]**

1. Failure to achieve 80 percent of the predicted maximum heart rate at peak exercise (chronotropic incompetence) associated with symptoms
2. Syncope, near syncope, congestive heart failure or shortness of breath that is only associated with a heart rate less than 60 beats per minute AND [One]
 - a. Current medication management that slows the heart rate which cannot be decreased or discontinued
 - b. No current medication management that slows the heart
3. Syncope, near syncope, congestive heart failure or shortness of breath and a documented heart rate less than or equal to 40 beats per minute or sinus pauses over three seconds AND [One]
 - a. Current medication management that slows the heart rate which cannot be decreased or discontinued
 - b. No current medication management that slows the heart
4. Either of the following were identified on electrophysiology testing
 - a. Corrected sinus node recovery time over 525 milliseconds
 - b. Prolonged sinoatrial conduction time

B. Acquired Atrioventricular Block (after all reversible causes have been excluded, including whether current medication management that slows the heart rate can be decreased or discontinued) [One]

1. First Degree Atrioventricular Block [One]
 - a. Symptoms similar to pacemaker syndrome or hemodynamic compromise
 - b. Intra-or infra-His bundle block is demonstrated on electrophysiologic study
 - c. Documentation of myotonic dystrophy, Erb dystrophy, or peroneal muscular atrophy
2. Second Degree Atrioventricular Block – Type I [One]
 - a. Syncope or near syncope, congestive heart failure, or shortness of breath
 - b. Atrioventricular block is exercise induced AND ischemia has been excluded
 - c. Intra- or infra-His bundle block is demonstrated on electrophysiologic study
 - d. Documentation of myotonic dystrophy, Erb dystrophy, or peroneal muscular atrophy
3. Second Degree – Type II/Advanced Second Degree/Third Degree Atrioventricular Block

- C. Bifascicular Block/Left Bundle Branch Block [One]
 - 1. Advanced second degree or intermittent/chronic third degree atrioventricular block
 - 2. Alternating bundle-branch block
 - 3. Documentation of any of the following on electrophysiologic study [One]
 - a. HV interval 100 milliseconds or more
 - b. Non-physiologic pacing-induced infra-His bundle block
 - 4. Syncope
 - 5. Documentation of myotonic dystrophy, Erb dystrophy, or peroneal muscular atrophy with fascicular block
- D. Acute Myocardial Infarction [One]
 - 1. Persistent second or third degree atrioventricular block
 - 2. Transient second or third degree atrioventricular block with an associated bundle branch block
- E. Hypersensitive Carotid Sinus/Neurocardiogenic Syncope
 - 1. Documented history of syncope or presyncope [One]
 - a. Ventricular asystole over three seconds after carotid sinus stimulation
 - b. Bradycardia associated with neurocardiac syncope was documented by electrocardiographic monitoring or tilt-table testing
- F. Prior Heart Transplantation [One]
 - 1. Persistent symptomatic bradycardia
 - 2. Persistent bradycardia limiting rehabilitation or hospital discharge
 - 3. Syncope
- G. Tachycardia Prevention/Termination [One]
 - 1. Recurrent supraventricular tachycardia (SVT)
 - a. Terminated by pacing on electrophysiologic study AND
 - b. Not controlled by medications or catheter ablation
 - 2. Pause dependent ventricular tachycardia in the absence of non-essential rate slowing medications
 - 3. Symptomatic drug-refractory recurrent atrial fibrillation in association with sinus bradycardia AND
 - a. Any criterion under section A (Sinus Node Dysfunction) is met
- H. Congenital Heart Disease [One]
 - 1. Third or advanced second degree heart block
 - 2. Sinus node dysfunction [One]
 - a. Documented symptoms associated with age inappropriate bradycardia
 - b. Recurrent intra-atrial tachycardia
 - c. Heart rate less than 40 beats per minute
 - d. Ventricular pauses over three seconds
 - e. Impaired hemodynamics due to sinus bradycardia

- f. Impaired hemodynamics due to loss of atrioventricular synchrony
- I. Hypertrophic Obstructive Cardiomyopathy
 - 1. Left ventricular outflow tract gradient of greater than 30 mmHg at rest or greater than 50 mmHg with provocation AND
 - 2. Continued symptoms refractory to medical therapy

II. **Cardiac Resynchronization Therapy (CRT): Biventricular Pacemaker with or without an Implantable Cardioverter-Defibrillator²**

Documentation of a left ventricular ejection fraction less than or equal to 35 percent after guideline directed medical therapy for congestive heart failure (GDMT⁴) has been administered for 40 days following a myocardial infarction or 90 days if there is no history of a recent myocardial infarction plus ONE of the following:

- A. Ventricular pacing is required for another indication AND
 - 1. There will be atrioventricular node ablation OR
 - 2. There is an anticipated requirement for 40 percent ventricular pacing or greater
- B. Non-left bundle branch morphology QRS duration 150 milliseconds or more AND Class II, III, or ambulatory class IV congestive heart failure symptoms⁵ AND EITHER
 - 1. Atrial fibrillation is not the predominant rhythm OR
 - 2. Atrial fibrillation is the predominant rhythm and rate control will result in near 100 percent pacing
- C. Non-left bundle branch morphology, QRS duration 120-149 milliseconds AND Class III or ambulatory class IV congestive heart failure symptoms⁵
- D. Left bundle branch morphology, QRS duration 150 milliseconds or more Class I congestive heart failure symptoms, ischemic cardiomyopathy, and left ventricular ejection fraction 30 percent or less
- E. Left bundle branch morphology, QRS duration 120 milliseconds or more Class II, III, or ambulatory class IV congestive heart failure symptoms⁵ AND EITHER
 - 1. Atrial fibrillation is not the predominant rhythm OR
 - 2. Atrial fibrillation is the predominant rhythm and rate control will result in near 100 percent pacing

III. **Automatic Implantable Cardioverter-Defibrillator (ICD)² [One]**

- A. Known cardiac arrest likely or definitely due to ventricular tachycardia or fibrillation

1. Reversible causes such as electrolyte imbalance and coronary artery disease amenable to revascularization have been excluded
- B. Ventricular tachycardia or ventricular fibrillation documented on electrophysiologic study
 1. Reversible causes such as electrolyte imbalance and coronary artery disease amenable to revascularization have been excluded
- C. Syncope [One]
 1. Ventricular fibrillation or sustained ventricular tachycardia³ was induced on electrophysiologic testing
 2. Ventricular fibrillation or sustained ventricular tachycardia³ was documented on electrocardiography
 3. Left ventricular dysfunction
 4. Primary electrical disease [One]
 - a. Long QT syndrome with syncope while on B-blocker therapy [One]
 - i. Syncope while on B-blockers
 - ii. Ventricular tachycardia or fibrillation while on B-blockers
 - iii. Family history of sudden cardiac death
 - iv. Type 3 long QT syndrome genotype
 - v. QTc interval > 500 milliseconds
 - b. Brugada syndrome
 - c. Catecholamine induced ventricular tachycardia with syncope while on B-blocker therapy
- D. Prior myocardial infarction and known coronary artery disease [One]
 1. An indication for a pacemaker during the 40 day lockout period is present and ejection fraction 35 percent or less
 2. Myocardial infarction 40 or more days ago [One]
 - a. **Medicare Only** – no coronary artery bypass surgery or percutaneous coronary intervention has been performed in the last 90 days [And b, c or d]
 - b. Ventricular fibrillation or sustained ventricular tachycardia³ was induced on electrophysiologic testing
 - c. Left ventricular ejection fraction 31-35 percent
 - i. Class II or III congestive heart failure despite maximal medical therapy
 - d. Left ventricular ejection fraction 30 percent or less
 - i. Class I, II, or III congestive heart failure despite maximal medical therapy
- E. Dilated cardiomyopathy with no known coronary disease
 1. Left ventricular ejection fraction 35 percent or less

- a. Class I, II, or III congestive heart failure is present after maximal medical therapy
- F. Structural heart disease [One]
 - 1. Congenital heart disease [One]
 - a. Syncope with left ventricular dysfunction
 - b. Ventricular fibrillation or sustained ventricular tachycardia³ documented on electrocardiography or induced on electrophysiologic study
 - 2. Hypertrophic obstructive cardiomyopathy and ANY of the following
 - a. Prior cardiac arrest
 - b. Ventricular tachycardia or ventricular fibrillation on electrocardiography
 - c. Family history of sudden cardiac death
 - d. Left ventricular thickness of three centimeters or greater
 - e. Hypotensive blood pressure response to exercise testing
 - 3. Arrhythmogenic right ventricular dysplasia
 - 4. Documented cardiac sarcoid, giant cell myocarditis, Chagas disease or non-compaction
 - 5. Outpatient awaiting cardiac transplantation
- G. Primary electrical disease [One]
 - 1. Long QT syndrome and ONE of the following
 - a. Syncope while on B-blockers
 - b. Ventricular tachycardia or fibrillation while on B-blockers
 - c. Family history of sudden cardiac death
 - d. Type 3 long QT syndrome genotype
 - e. QTc interval > 500 milliseconds
 - 2. Brugada syndrome and ANY of the following
 - a. Syncope
 - b. Ventricular tachycardia on electrophysiologic study
 - c. Family history of sudden cardiac death
 - 3. Catecholamine induced ventricular tachycardia and ANY of the following
 - a. Syncope while on B-blockers
 - b. Ventricular tachycardia while on B-blockers

IV. Subcutaneous implantable cardioverter-defibrillators (S-ICD) are proven and medically necessary for treating ventricular arrhythmias in patients who meet ALL of the following criteria⁷⁻²⁷:

- A. Are candidates for a conventional transvenous implantable cardioverter-defibrillator (ICD); AND
- B. Do not have symptomatic bradycardia, incessant ventricular tachycardia, spontaneous arrhythmias, or frequently recurring ventricular tachycardia that is reliably terminated with anti-tachycardia pacing; AND

C. Have ONE or more of the following medical contraindications to a conventional transvenous ICD:

1. Lack of adequate venous access due to occlusion or congenital anomaly
2. High risk of complications for transvenous access (e.g., patient is on dialysis or immunocompromised)
3. Infection associated with a conventional transvenous ICD.

Subcutaneous implantable cardioverter-defibrillators (S-ICD) are unproven and not medically necessary for all other indications due to insufficient evidence supporting safety and efficacy.

Footnotes:

¹For approved pacemakers, a dual chamber pacemaker (DDD) is appropriate unless there is chronic atrial fibrillation or frequent supraventricular tachycardia. A DDD upgrade from a single chamber device is appropriate if pacemaker syndrome is present.

²Please refer to health plan specific policy to determine prior authorization requirements

³Sustained ventricular tachycardia is defined as lasting 30 or more seconds at a rate of 100 beats/minute or greater

⁴GDMT should include an adequate trial of pharmacologic agents (oral loop diuretics, beta-blockers, ACE inhibitors or angiotensin receptor blockers, vasodilators, and behavioral modification (dietary guidelines regarding salt and fluid intake) for 90 days.

⁵New York Heart Association classification for congestive heart failure.

Class	Patient Symptoms
Class I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnea (shortness of breath).
Class II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnea.
Class III (Moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, or dyspnea.
Class IV (Severe)	Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.

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- 93303 Transthoracic Echocardiography for Congenital Cardiac Anomalies; Complete**
- 93304 Transthoracic Echocardiography for Congenital Cardiac Anomalies; Follow-up or Limited Study**
- 93306 Echocardiography, Transthoracic, Real-time with Image Documentation (2D), Includes M-mode Recording, when Performed, Complete, with Spectral Doppler Echocardiography, and with Color Flow Doppler Echocardiography**
- 93307 Echocardiography, Transthoracic, Real-time with Image Documentation (2D) with or without M-mode Recording; Complete**
- 93308 Echocardiography, Transthoracic, Real-time with Image Documentation (2D) with or without M-mode Recording; Follow-up or Limited Study**
- 93320 Doppler Echocardiography, Pulsed Wave and/or Continuous Wave with Spectral Display; Complete**
- 93321 Doppler Echocardiography, Pulsed Wave and/or Continuous Wave with Spectral Display; Follow-up or Limited Study**
- 93325 Doppler Echocardiography Color Flow Velocity Mapping**

If the requested echocardiogram is for follow-up on a previously abnormal echo then CPT codes 93304, 93308, or 93321 can be used for limited studies.

- I. Ventricular Function, Cardiomyopathies, and Heart Failure [One]**
 - A. Dyspnea or shortness of breath [One]
 - 1. New or worsening dyspnea or shortness of breath
 - 2. Unchanged dyspnea or shortness of breath with no prior echocardiogram for this diagnosis
 - B. Congestive heart failure [One]
 - 1. No prior echocardiogram was performed for this indication
 - 2. Worsening clinical status
 - 3. Changed clinical examination

4. Changed medical therapy
 5. **Medicare:** annual assessment
- C. Hypertrophic cardiomyopathy, cardiac sarcoidosis, cardiac amyloidosis [One]
1. No prior echocardiogram was performed for this diagnosis
 2. Worsening clinical status
 3. Changed therapy
 4. **Medicare:** annual assessment
- D. Planned septal ablation
- E. Planned right ventricular biopsy
- F. Cardiomyopathy screening
1. Parent or sibling with an inherited cardiomyopathy AND no prior echocardiogram performed for this indication

II. Hypertensive Heart Disease [One]

- A. No prior echocardiogram was performed for this indication
- B. **Medicare:** annual assessment

III. Acute Myocardial Infarction and Coronary Insufficiency [One]

- A. Recent myocardial infarction documented by abnormal cardiac enzymes or new Q waves on an electrocardiogram with evidence of any of the following
 1. Mural thrombus
 2. Papillary muscle dysfunction
 3. Atrial/ventricular septal defect
 4. Cardiac aneurysm or rupture
 5. Heart failure
 6. Required to guide a change in therapy
- B. Chest pain
 1. Evaluation of suspected pericarditis documented by a cardiac rub or diffuse ST elevation if no prior echocardiogram has been performed for this indication

IV. Monitoring Therapy with Cardiotoxic Agents [One]

- A. No prior MUGA or echocardiogram was performed for this indication
- B. No further treatment courses are planned AND the last course was completed six or more months ago
- C. Further treatment courses are planned AND the last MUGA or echo was two or more months ago

V. Cardiac Transplant and Rejection Monitoring [One]

- A. No prior echocardiogram has been performed for this indication
- B. Evidence of transplant rejection
- C. Cardiac transplantation occurred in the last two months
- D. No echocardiogram has been performed in the last six months
- E. Potential cardiac transplant donor

VI. Native or Prosthetic Valvular Heart Disease/Acute Endocarditis [One]

- A. Heart click or murmur without a prior echocardiogram for this indication
- B. Evaluation of aortic or mitral regurgitation [One]
 - 1. No prior echocardiogram has been performed for this indication
 - 2. Documentation of ANY of the following
 - a. Worsening clinical status
 - b. Changed clinical examination
 - c. Changed medical therapy
 - 3. Moderate or severe regurgitation on a prior echocardiogram performed one year ago or more
- C. Mitral stenosis, aortic stenosis, aortic sclerosis, bicuspid aortic valve, pulmonic stenosis [One]
 - 1. No prior echocardiogram has been performed for this indication
 - 2. Documentation of ANY of the following
 - a. Worsening clinical status
 - b. Changed clinical examination
 - c. Changed medical therapy
 - 3. Mild stenosis on an a prior echocardiogram performed three or more years ago
 - 4. Moderate or severe stenosis on a prior echocardiogram performed one year ago or more
- D. Evaluation of a prosthetic heart valve [One]
 - 1. No echocardiogram has been performed since valve surgery
 - 2. Documentation of ANY of the following
 - a. Worsening clinical status
 - b. Changed clinical examination
 - c. Changed medical therapy
 - 3. The last echocardiogram was performed three or more years ago
 - 4. **Medicare:** annual assessment of prosthetic valve
- E. Evaluation of endocarditis [One]
 - 1. Endocarditis is a new diagnosis documented by a new murmur or positive blood cultures
 - 2. Documentation of ANY of the following
 - a. Worsening clinical status
 - b. Changed clinical examination
 - c. Changed medical therapy

VII. Pericardial Disease [One]

- A. Pericarditis [One]
 - 1. Documentation of a cardiac rub or diffuse ST elevation on the electrocardiogram AND
 - 2. No prior echocardiogram has been performed for this diagnosis
- B. Constrictive pericarditis or pericardial effusion [One]
 - 1. No prior echocardiogram has been performed for these indications
 - 2. Re-evaluation is required to guide future therapy

3. Pericardiocentesis is planned

VIII. Abnormalities of the Great Vessels

- A. Ascending aortic dissection or aneurysm, or Marfan syndrome, Ehlers-Danlos syndrome, or Loeys-Dietz syndrome. [One]
 1. No prior echocardiogram has been performed for this indication
 2. Documentation of ANY of the following
 - a. Worsening clinical status
 - b. Changed clinical examination
 - c. Changed medical therapy
 3. The last echocardiogram was performed one year ago or more

IX. Congenital Heart Disease [One]

- A. No prior echocardiogram has been performed for this diagnosis
- B. Congenital heart disease documented on a prior echocardiogram [One]
 1. Documentation of ANY of the following
 - a. Worsening clinical status
 - b. Changed clinical examination
 - c. Changed medical therapy
 2. The last cardiac imaging procedure was performed one year ago or more

X. Suspected Cardiac Thrombus or Cardiogenic Embolism

- A. Documented cerebrovascular aneurysm, transient ischemic attack or peripheral vascular event
 1. No prior echocardiogram has been performed for this indication AND no transesophageal echocardiogram is planned

XI. Cardiac Tumors and Masses

- A. Suspected cardiac tumor, mass or atrial myxoma [One]
 1. No prior echocardiogram has been performed for this indication
 2. A mass, tumor or atrial myxoma was documented on a prior echocardiogram [And One]
 - a. The last cardiac imaging was performed one year ago or more
 - b. New cardiac symptoms are present

XII. Arrhythmias and Palpitations

- A. Multifocal ventricular premature contractions, ventricular couplets, atrial fibrillation, supraventricular tachycardia, or ventricular tachycardia [One]
 1. No prior echocardiogram was performed for this indication and the arrhythmia was documented on an electrocardiogram, Holter monitor, or event monitor
 2. **Medicare:** annual assessment for structural heart disease

XIII. Syncope and Presyncope [One]

- A. No prior echocardiogram was performed for this indication
- B. Congestive heart failure, aortic stenosis, or hypertrophic cardiomyopathy was documented on a prior echocardiogram

XIV. Pulmonary Evaluation [One]

- A. Pulmonary hypertension [One]
 - 1. No prior echocardiogram was performed for this indication
 - 2. A prior echo echocardiogram documented pulmonary hypertension [One]
 - a. Documented change in clinical status or cardiac examination
 - b. An echocardiogram is required to guide therapy
 - c. The last echocardiogram was one year ago or more
- B. Pulmonary embolism
 - 1. A pulmonary embolism has been documented AND
 - 2. Thrombolysis or thrombectomy has been performed and right ventricular function or pulmonary artery pressure is being evaluated
- C. Hypoxemia
 - 1. Non-cardiac causes for hypoxemia have been excluded

XV. Contrast Echocardiography

- A. A non-contrast echocardiogram has been performed AND
- B. Two or more contiguous left ventricular segments were not seen and this information is essential to management

XVI. Abnormal Cardiac Testing or Findings

- A. Elevated troponin, cardiomegaly on chest x-ray, or left ventricular hypertrophy on the electrocardiogram AND
- B. No prior echo cardiogram has been performed for this indication

XVII. Implantable Devices

- A. Pacemaker and internal cardiac defibrillator [One]
 - 1. No device is implanted [One]
 - a. Assess ejection fraction after percutaneous coronary intervention
 - b. Assess ejection fraction after coronary artery bypass surgery
 - c. Assess ejection fraction after optimal medical therapy
 - 2. A device is implanted [One]
 - a. Assess symptoms due to a complication of device insertion
 - b. Assess symptoms due to suboptimal device settings
- B. Ventricular assist device
 - 1. No device is implanted
 - a. Determine candidacy for a ventricular assist device
 - 2. A device is implanted [One]
 - a. Initial optimization of device settings
 - b. Assess symptoms due to suboptimal device settings
 - c. Assess symptoms due to suboptimal device settings

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93350 ECHOCARDIOGRAPHY, TRANSTHORACIC, REAL-TIME WITH IMAGE DOCUMENTATION (2D), INCLUDES M-MODE RECORDING, WHEN PERFORMED, DURING REST AND CARDIOVASCULAR STRESS TEST USING TREADMILL, BICYCLE EXERCISE AND/OR PHARMACOLOGICALLY INDUCED STRESS, WITH INTERPRETATION AND REPORT WITH OR WITHOUT M-MODE RECORDING, DURING REST AND CARDIOVASCULAR STRESS TEST, WITH INTERPRETATION AND REPORT

93351 ECHOCARDIOGRAPHY, TRANSTHORACIC, REAL-TIME WITH IMAGE DOCUMENTATION (2D), INCLUDES M-MODE RECORDING, WHEN PERFORMED, DURING REST AND CARDIOVASCULAR STRESS TEST USING TREADMILL, BICYCLE EXERCISE AND/OR PHARMACOLOGICALLY INDUCED STRESS, WITH INTERPRETATION AND REPORT WITH OR WITHOUT M-MODE RECORDING, DURING REST AND CARDIOVASCULAR STRESS TEST, WITH INTERPRETATION AND REPORT; INCLUDING PERFORMANCE OF CONTINUOUS ELECTROCARDIOGRAPHIC MONITORING, WITH SUPERVISION BY A QUALIFIED HEALTHCARE PROFESSIONAL

I. Evaluation prior to non-cardiac surgery [One of the following]

- A. With current cardiac symptoms [One of the following]
 - 1. Prior documentation of coronary artery disease (Section II)
 - 2. Inability to exercise on a treadmill
 - 3. Abnormal ECG, uninterpretable for routine ETT (Section V)
- B. Without current cardiac symptoms
 - 1. Low risk surgery is not supported

2. Intermediate risk surgery [One of the following]
 - a. Inability to reach four METS on treadmill exercise stress testing
 - b. If the ECG is uninterpretable or the patient cannot walk on a treadmill and the patient has one of the following:
 - i. Creatinine 2.0 or greater
 - ii. Diabetes
 - iii. Heart failure
 - iv. Known CAD
3. High risk surgery
 - a. No imaging stress test within the prior year, unless the patient has new cardiac symptoms or new changes in the ECG (since the prior stress test)

STRESS TESTING with IMAGING - INDICATIONS	
Stress echo, MPI OR stress MRI, can be considered for the following:	
1.	<p>New, recurrent or worsening cardiac symptoms AND with any of the following:</p> <ul style="list-style-type: none"> ○ High pretest probability (greater than 90% probability of CAD) ○ A history of CAD based on: <ul style="list-style-type: none"> ● A prior anatomic evaluation of the coronaries OR ● A history of CABG or PCI ○ Evidence or high suspicion of ventricular tachycardia ○ Age 50 years or greater and known diabetes mellitus ○ Coronary calcium score ≥ 400 ○ New or previously unrecognized uninterpretable ECG ○ Poorly controlled hypertension defined as systolic BP greater than or equal to 180mmhg, if provider feels strongly that CAD needs evaluation prior to BP being controlled. ○ ECG is uninterpretable for ischemia due to any one of the following: <ul style="list-style-type: none"> ● Complete Left Bundle Branch Block (bifascicular block involving right bundle branch and left anterior hemiblock does <u>not</u> render ECG uninterpretable for ischemia) ● Ventricular paced rhythm ● Pre-excitation pattern such as Wolff-Parkinson-White ● >0.5 mm ST segment depression (NOT nonspecific ST/T wave changes) ● LVH with repolarization abnormalities, also called LVH with strain (NOT without repolarization abnormalities or by voltage criteria) ● T-wave inversion in the inferior and/or lateral leads. (leads II, AVF, V5, or V6) ● Patient on digitalis preparation ○ Continuing symptoms in a patient who had a normal or submaximal exercise treadmill test and there is suspicion of a false negative result. ○ Patients with recent equivocal, borderline, or abnormal stress testing where ischemia remains a concern. ○ Heart rate less than 50 bpm in patients on beta blocker and/or calcium channel blocker medication where it is felt that the patient may not achieve an adequate workload for a diagnostic exercise study. ○ Inadequate ETT:

	<ul style="list-style-type: none"> Physical inability to perform a maximum exercise workload. History of false positive exercise treadmill test: a false positive ETT is one that is abnormal however the abnormality does not appear to be due to macrovascular CAD.
2.	<p>Within 3 months of an acute coronary syndrome (e.g. ST segment elevation MI [STEMI], unstable angina, non-ST segment elevation MI [NSTEMI]), one MPI can be performed to evaluate for inducible ischemia if all of the following related to the most recent acute coronary event apply:</p> <ul style="list-style-type: none"> Individual is hemodynamically stable No recurrent chest pain symptoms and no signs of heart failure <p>No prior coronary angiography or imaging stress test in regards to the current episode of symptoms</p>
3.	<p>Assessing myocardial viability in patients with significant ischemic ventricular dysfunction (suspected hibernating myocardium) and persistent symptoms or heart failure such that revascularization would be considered.</p> <p>NOTE: MRI, cardiac PET, or MPI can be used to assess myocardial viability depending on physician preference</p>
Regardless of symptoms, imaging can be approved for the following clinical scenarios:	
4.	Unheralded syncope (<u>not</u> near syncope)
5.	Asymptomatic patient with an uninterpretable ECG that has never been evaluated or is a new uninterpretable change.
6.	Patient with an elevated cardiac troponin.
7.	One routine study 2 years or more after a stent, except with a left main stent where it can be done at 1 year.
8.	One routine study at 5 years or more after CABG, without cardiac symptoms.
9.	Every 2 years if there was documentation of previous "silent ischemia" on the imaging portion of a stress test but not on the ECG portion.
10.	To assess for CAD in a patient taking flecainide or propafenone
11.	Prior anatomic imaging study (coronary angiogram or CCTA) demonstrating coronary stenosis in a major coronary branch which is of uncertain functional significance can have one stress test with imaging.
12.	Evaluating new, recurrent or worsening left ventricular dysfunction/CHF.

- II. Evaluation of known coronary artery disease by an anatomic exam such as invasive coronary angiography or CCTA or a Coronary Calcium (Agaston) Score greater than or equal to 400**
- A. Recent hospitalization (within 3 months) for acute myocardial infarction, acute coronary syndrome, or unstable angina [One of the following]

1. No cardiac catheterization, imaging stress test or cardiac CT angiogram during or since the hospitalization (stable and without symptoms)
 2. Recurrent chest pain or shortness of breath since discharge
 3. Percutaneous coronary intervention or coronary artery bypass surgery during the hospitalization
 - a. New chest pain or shortness of breath has developed since the intervention
- B. No recent hospitalization for acute myocardial infarction, acute coronary syndrome, or unstable angina and documentation of CAD by a prior cardiac catheterization, cardiac CT angiogram, coronary calcium score greater or equal to 400 or, and [One of the following]
1. New chest pain or shortness of breath
 2. No new chest pain or shortness of breath [One of the following]
 - a. Post percutaneous coronary intervention. One post PCI imaging stress study may be approved in the asymptomatic patient. Generally this is done after 2 years or greater
 - b. Coronary artery bypass surgery was performed five years prior. Once post CABG imaging stress study may be approved at five years or later, unless the patient becomes symptomatic.
 - c. Prior documentation of congenital coronary arterial anomalies by cardiac catheterization or coronary CT angiography and the physiology of the anomaly as never been assessed.
 - d. Patient is unable to exercise on treadmill (may have repeat stress) imaging every two years.
- III. Evaluation of newly diagnosed congestive heart failure**
- A. No heart catheterization, imaging stress test or cardiac CT angiogram was performed since the diagnosis of congestive heart failure
- IV. Evaluation of newly diagnosed cardiomyopathy**
- A. The ejection fraction is less than 50 percent and no heart catheterization, imaging stress test or cardiac CT angiogram has been performed or planned since the new diagnosis of cardiomyopathy
- V. Evaluation of suspected coronary artery disease symptoms [One of the following]**
- A. Evaluation of documented ventricular tachycardia
- B. Evaluation of chest pain [One of the following]
1. High pre-test probability assessment
 2. Low or intermediate pre-test probability assessment (plus one of the following)
 - a. Inability to perform an exercise stress test therefore requiring a pharmacologic test

- b. Electrocardiogram demonstrates Wolff- Parkinson-White syndrome, complete left bundle branch block, ventricular paced rhythm, 0.5 mm or more ST-T depression with horizontal or downsloping ST segments at 80 msec after the J point, LVH with repolarization abnormalities or T wave inversion in the inferior and/or lateral lead (II, AVF, V5, or V6)
- c. Currently taking digoxin/Lanoxin[®]
- d. Abnormal standard exercise stress test documents due to [One of the following]
 - i. 0.5 mm or more ST depression with horizontal or downsloping ST segments at 80 msec after the J point
 - ii. Ventricular tachycardia, multifocal premature ventricular contractions or triplets
 - iii. Heart block
 - iv. Drop in systolic blood pressure of 10 mmHg or more
 - v. Inability to attain 85 percent of the maximum predicted heart rate
 - vi. Chest pain with exercise
- C. Evaluation of heralded syncope [One of the following]
 - 1. Diabetes
 - 2. Coronary calcium score greater or equal to 400
 - 3. Patient is unable to exercise on treadmill
 - 4. ECG is uninterpretable for ETT
- D. Evaluation of silent ischemia
 - 1. Prior abnormal imaging stress test with accompanying normal ECG on ETT may undergo imaging every two years

VI. Unheralded syncope (not near syncope)^{2, 4, 5, 6-25}

VII. Indications in asymptomatic patients

- A. Assessment based on uninterpretable electrocardiogram (section V) [One of the following]
 - 1. New electrocardiographic finding making the ECG uninterpretable for ETT
 - 2. Uninterpretable EKG for an ETT that has never been evaluated.
- B. Elevated troponin
 - 1. The elevated troponin was documented less than four weeks ago and no imaging stress test, cardiac CT angiogram or catheterization has been performed within the last four weeks
- C. Assessment based on abnormal routine exercise stress test (see V.2.d above for definition)
- D. The patient is taking a class Ic antiarrhythmic agent (propafenone, flecainide)
- E. Uncontrolled HTN or Bradycardia (One of the following)
 - 1. Poorly controlled hypertension defined as systolic BP greater or equal to 180 mmHg, if the provider feels strongly that CAD needs evaluation prior to BP being controlled. This is assuming that the test needs to be done pharmacologically.

2. Heart rate less than 50 bpm in patients on beta blocker and/or calcium channel blocker medication where it is felt that the patient may not achieve an adequate workload for a diagnostic exercise study.

VIII. Cardiac Transplant Patients

- A. Post-cardiac transplant assessment of transplant CAD:
 1. One of the following imaging studies may be performed annually. These are usually done in lieu of an invasive coronary angiogram.
 - a. MPI
 - b. Stress Echocardiogram
 - c. Stress MRI
 - d. Cardiac PET perfusion **with** coronary flow quantitation (CPT[®] 78491 or CPT[®] 78492)

IX. Non-Cardiac Transplant Patients

- A. Individuals who are awaiting an organ, bone marrow or stem cell transplant can undergo imaging stress testing every year (usually stress echo or MPI) prior to the transplant.
- B. Individuals who have undergone organ transplant are at increased risk for ischemic heart disease secondary to their medication. An imaging stress test can be repeated annually after transplant for at least two years or within one year of a prior cardiac imaging study if there is evidence of progressive vasculopathy. After two consecutive normal imaging stress tests, repeated testing is supported every two years unless there is evidence of progressive vasculopathy or new symptoms.

X. Myocardial Viability

- A. Assessing myocardial viability in patients with significant ischemia, ventricular dysfunction (suspected hibernating myocardium) and persistent symptoms or heart failure such that revascularization would be considered.
 1. Note: MRI, cardiac PET or MPI can be used to assess myocardial viability depending on physician preference

Rule 1: Determination of pretest probability for coronary disease based on chest pain

Pre-Test Probability of CAD by Age, Gender, and Symptoms					
Age-Years	Gender	Typical/Definite Angina Pectoris	Atypical/Probable Angina Pectoris	Non-anginal Chest Pain	Asymptomatic
30-39	Men	Intermediate	Intermediate	Low	Very low
	Women	Intermediate	Very low	Very low	Very low
40-49	Men	High	Intermediate	Intermediate	Low
	Women	Intermediate	Low	Very low	Very low

50-59	Men	High	Intermediate	Intermediate	Low
	Women	Intermediate	Intermediate	Low	Very low
≥60	Men	High	Intermediate	Intermediate	Low
	Women	High	Intermediate	Intermediate	Low
High: Greater than 90% pre-test probability Intermediate: Between 10% and 90% pre-test probability Low: Between 5% and 10% pre-test probability Very Low: Less than 5% pre-test probability					
Typical angina (definite): 1) Substernal chest pain or discomfort that is 2) provoked by exertion or emotional stress and 3) relieved by rest and/or nitroglycerin.					
Atypical angina (probable): Chest pain or discomfort that lacks one of the characteristics of definite or typical angina.					
Non-anginal chest pain: Chest pain or discomfort that meets one or none of the typical angina characteristics.					

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- 93452** Left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
- 93453** Combined right and left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed
- 93454** Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation
- 93455** Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial venous grafts) including intraprocedural injection(s) for bypass graft angiography
- 93456** Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right heart catheterization
- 93457** Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography and right heart catheterization
- 93458** Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural

injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed

93459 Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography

93460 Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed

93461 Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography

I. Evaluation of Acute Coronary Syndrome

- A. ST elevation or non-ST elevation myocardial infarction
- B. Acute chest pain suspicious for unstable angina [One]

1. Routine or imaging stress test performed prior to the catheterization demonstrated ischemia
2. New wall motion abnormalities or resting cardiac perfusion defects
3. High risk pre-test probability assessment

II. Evaluation of Known Coronary Artery Disease [One]

- A. New or worsening symptoms
 1. High risk pre-test probability assessment
- B. Abnormal imaging stress test in the last 3 months [One]
 1. Reversible ischemia
 2. Transient ischemic dilation
 3. Fixed perfusion defect involving > 5% of the myocardium
 4. New wall motion abnormality
 5. Equivocal or uninterpretable images
- C. Abnormal routine stress test
 1. Treadmill stress test demonstrated chest pain, one mm or more ST-J segment depression with horizontal or downsloping ST segments 80 msec after the J point, ventricular tachycardia or multifocal premature ventricular contractions, heart block or a 10 mmHg or more drop in systolic blood pressure
- D. Prior abnormal cardiac CT angiogram and new symptoms [One]
 1. Non-obstructive coronary artery disease or uninterpretable and high risk pre-test clinical assessment
 2. Coronary stenosis 50 percent or more
- E. Prior abnormal cardiac catheterization and new symptoms
 1. Catheterization documented coronary artery disease and new chest pain or dyspnea on exertion is documented
- F. Staged coronary intervention without new or recurrent symptoms [One]
 1. Initial procedure was performed for acute coronary syndrome
 2. Significant left ventricular dysfunction
 3. Renal insufficiency
 4. Complex or prolonged initial procedure
- G. Recurrent symptoms after revascularization
 1. Recurrent symptoms identical to those present prior to coronary artery bypass grafting or percutaneous coronary intervention

III. Evaluation of Newly Diagnosed Congestive Heart Failure [One]

- A. No cardiac catheterization, coronary CT angiogram, or imaging stress test has been performed since the onset of congestive heart failure
- B. Cardiac CT angiography demonstrated coronary artery disease
- C. An imaging stress test within the last three months demonstrated reversible ischemia

IV. Evaluation of Cardiomyopathy [One]

- A. No cardiac catheterization, coronary CT angiogram, or imaging stress test has been performed since the onset of congestive heart failure
- B. Change in clinical status or physical examination, or repeat coronary angiography is needed to guide therapy

V. Evaluation of Suspected Coronary Artery Disease [One]

- A. New or worsening cardiac symptoms and no prior cardiac testing
 - 1. High risk symptoms on the pre-test probability assessment
- B. Abnormal imaging stress test in the last 3 months [One]
 - 1. Reversible ischemia
 - 2. Transient ischemic dilatation
 - 3. Fixed perfusion defect involving > 5% of the myocardium
 - 4. New wall motion abnormality
 - 5. Equivocal or uninterpretable study
- C. Abnormal routine stress test documents ANY
 - 1. One mm or more ST-J depression with horizontal or downsloping ST segments for 80 msec after the J point
 - 2. Ventricular tachycardia, multifocal premature ventricular contractions or triplets
 - 3. Heart block
 - 4. Drop in systolic blood pressure of 10 mmHg or more
 - 5. Chest pain

VI. Evaluation Prior to Non-Cardiac Surgery

- A. Anticipated solid organ transplantation
- B. Unable to exercise to 4 METS or more [And Either]
 - 1. Intermediate-risk surgery with 3 or more of the following risk factors
 - a. Coronary artery disease
 - b. Congestive heart failure
 - c. Cerebrovascular disease
 - d. Insulin requiring diabetes
 - e. Creatinine > 2.0
 - 2. High risk surgery with at least one of the following risk factors
 - a. Coronary artery disease
 - b. Congestive heart failure
 - c. Cerebrovascular disease
 - d. Insulin requiring diabetes
 - e. Creatinine > 2.0

VII. Evaluation of Congenital Heart Disease

- A. Documented congenital heart disease

VIII. Other Cardiovascular Indications [One]

- A. Cardiac arrest/ventricular tachycardia
- B. Prior cardiac transplantation

- C. Aortic dissection
- D. Pre-operative evaluation for cardiac valve surgery
- E. Constrictive pericarditis or pericardial tamponade
- F. Atrial septal defect or patent foramen ovale closure
- G. Suspected ventricular aneurysm
- H. Intracardiac shunt

Rule 1: Determination of pretest probability for coronary disease based on chest pain

The following assessment is used to determine the pre-test probability of coronary artery disease based on a description of the character of chest pain, member age and sex. This assessment will define the chest pain as typical angina, atypical angina, and non-anginal chest pain

Pre-Test Probability of CAD by Age, Gender, and Symptoms					
Age-Years	Gender	Typical/Definite Angina Pectoris	Atypical/Probable Angina Pectoris	Non-anginal Chest Pain	Asymptomatic
30-39	Men	Intermediate	Intermediate	Low	Very low
	Women	Intermediate	Very low	Very low	Very low
40-49	Men	High	Intermediate	Intermediate	Low
	Women	Intermediate	Low	Very low	Very low
50-59	Men	High	Intermediate	Intermediate	Low
	Women	Intermediate	Intermediate	Low	Very low
≥60	Men	High	Intermediate	Intermediate	Low
	Women	High	Intermediate	Intermediate	Low
High: Greater than 90% pre-test probability		Intermediate: Between 10% and 90% pre-test probability	Low: Between 5% and 10% pre-test probability	Very Low: Less than 5% pre-test probability	

Typical angina (definite): 1) Substernal chest pain or discomfort that is 2) provoked by exertion or emotional stress and 3) relieved by rest and/or nitroglycerin.

Atypical angina (probable): Chest pain or discomfort that lacks one of the characteristics of definite or typical angina.

Non-anginal chest pain: Chest pain or discomfort that meets one or none of the typical angina characteristics.

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