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   B. Recent myocardial infarction
      1. Documentation of a myocardial infarction within the last four weeks AND
      2. Documentation of a heart catheterization since the myocardial infarction showing no obstructive stenosis
   C. Assessment of a recent cardiac catheterization or coronary CT angiogram
      1. Either of these studies revealed any stenosis of unclear clinical significance and that further imaging may alter management

II. Ventricular structure and function [One of the following]
   A. Assessment of congenital heart disease
      1. No cardiac magnetic resonance imaging study has been performed for this indication within the last year
   B. Assessment of acute myocardial infarction
      1. An echocardiogram was performed after the myocardial infarction and was uninterpretable
   C. Assessment of congestive heart failure
      1. An echocardiogram was performed for this indication and was uninterpretable
   D. Assessment of left ventricular ejection fraction
      1. An unexplained change in ejection fraction on recent cardiac imaging by another modality
   E. Cardiomyopathy
      1. Any of the following confirmed diagnoses are present [One of the following]
         a. Cardiac sarcoid (known or suspected)
         b. Cardiac amyloid
         c. Hypertrophic cardiomyopathy
      2. Cardiotoxic chemotherapy administration
         a. An echocardiogram or MUGA scan was performed and was uninterpretable
F. Arrhythmogenic right ventricular dysplasia or arrhythmogenic cardiomyopathy (ARVD/ARVC) suspicion (including presyncope or syncope, established criteria for ARVD (CPT® 75557 or CPT® 75561).1, 25-35

G. Assessment of elevated troponin
   1. Cardiac catheterization was performed and no obstructive coronary artery disease was identified

H. Assessment of global ventricular function and mass if a specific clinical question is left unanswered by a recent echocardiogram and results will affect patient management (CPT® 75557 or CPT® 75561)1, 25-35

III. Evaluate valvular heart disease when echocardiogram is inconclusive. Appropriate procedures include:1, 25-35
   1. CPT® 75557 or CPT® 75561 and
   2. CPT® 75565

IV. Intra-cardiac structures [One of the following]
   A. Radiofrequency ablation planning [One of the following]
      1. No cardiac CT has been performed for this indication
      2. Cardiac CT was performed but was uninterpretable
   B. Assessment of a cardiac mass
      1. Mass has been documented by echocardiography, cardiac catheterization or cardiac CT

V. Extra-cardiac structures [One of the following]
   A. Assessment of aortic dissection [One of the following]
      1. No cardiac CT has been performed for this indication
      2. A cardiac CT was performed, but was uninterpretable
   B. Assessment of pericardial disease
      1. An echocardiogram has been performed for this indication AND
      2. A cardiac CT was not performed or was performed and was uninterpretable

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VII. Suspected cardiac thrombus when echocardiogram is inconclusive (CPT® 75557)1, 25-35

VIII. Pulmonary Artery and Vein Imaging36-38
   A. Cardiac MRI (CPT® 75557 or CPT® 75561), chest MRV (CPT® 71555), chest CTV (CPT® 71275), or cardiac CT (CPT® 75572) can be performed to evaluate anatomy of the pulmonary veins:

IX. If pulmonary vein stenosis is present on imaging following ablation and symptoms of pulmonary vein stenosis (usually shortness of breath) are present, can be imaged at 1, 3, 6, and 12 months
X. **Cardiac Trauma – Imaging**

A. Any of the following can be used to evaluate cardiac or aortic trauma:

1. Echocardiogram (TTE, TEE)
2. Cardiac MRI (CPT® 75557, CPT® 75561, and CPT® 75565)
3. Cardiac CT (CPT® 75572)
4. CCTA (CPT® 75574)
5. Chest CTA (CPT® 71275)

References:


26. Clinical Examples in Radiology (Spring 2009)
27. CPT® Assistant (December 2011)

Medicare LCD References:
42. Local Coverage Determination (LCD) for Magnetic Resonance Angiography (MRA) (L31399). Novitas Solutions, Inc. [Delaware](http://www.cms.gov/medicare-coverage-database/search/search-results.aspx?SearchType=Advanced&CoverageSelection=Both&amp;ArticleType=Ed%7cKey%7cSAD%7cFAQ&Poli cyType=Both&sa=1&CntrctType=1%c9&CplHcpcsCode=75557&qk=true&bc=IAAAAAA&&
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45. Local Coverage Determination (LCD) for Magnetic Resonance Angiography (MRA) (L31399). Novitas Solutions, Inc. [New Jersey](http://www.cms.gov/medicare-coverage-database/search/search-results.aspx?SearchType=Advanced&CoverageSelection=Both&amp;ArticleType=Ed%7cKey%7cSAD%7cFAQ&Poli cyType=Final&sa=38&CntrctType=1%c9&CplHcpcsCode=75557&qk=true&bc=IAAAAAA&&
46. Local Coverage Determination (LCD) for Magnetic Resonance Angiography (MRA) (L31399). Novitas Solutions, Inc. Pennsylvania. [Link](http://www.cms.gov/medicare-coverage-database/search/search-results.aspx?SearchType=Advanced&CoverageSelection=Both&ArticleType=Ed%7cKey%7cSAD%7cFAQ&PolicyType=Both&s=45&CntrctrType=1%7c9&CptHcpcsCode=75557&kq=true&bc=IAAAAAAAAAAA&).
The uses for cardiac CT/coronary CT angiography (CCTA) include assessment for coronary artery disease, congenital heart disease, cardiac structure and morphology, and quantitative coronary calcium scoring.

The following is a list of exclusion criteria for CCTA:

- Atrial fibrillation
- Multifocal atrial tachycardia (MAT)
- Inability to lie flat
- Body mass index of 40 or more
- Inability to obtain a heart rate less than 65 beats per minute after beta-blockers
- Calcium (Agatston) score of 1000 or more
- Inability to hold breath for at least 8 seconds
- Renal insufficiency

I. **Coronary artery calcium scoring (75571)**
   A. No coronary calcium scoring in the last 5 years, no prior abnormal imaging stress test, coronary revascularization or prior catheterization or cardiac CT angiogram documenting coronary artery disease [And one of the following]
      1. ATP* risk <10 percent and [One of the following]
         a. Father or brother with coronary heart disease diagnosed at age 55 or less
         b. Mother or sister with coronary heart disease diagnosed at age 65 or less
      2. ATP* risk 10-19 percent AND
         a. No symptoms of chest pain or shortness of breath

II. **Cardiac CT for structure and morphology (75572) [One of the following]**
   A. Evaluation of native or prosthetic valve, cardiac mass, or pericardial mass
      1. A prior cardiac CT angiogram, cardiac MRI or echocardiogram was performed for this indication and was uninterpretable
   B. Coronary vein mapping
      1. Biventricular pacemaker placement is planned
   C. Coronary artery bypass graft localization
      1. Thoracic or cardiac surgery is planned
   D. Pulmonary vein evaluation
      1. Radiofrequency ablation for atrial fibrillation is planned
      2. If pulmonary vein stenosis is present on imaging following ablation and symptoms of pulmonary vein stenosis (usually shortness of breath) are present, can be imaged at 1, 3, 6, and 12 months.\(^{11-13}\)
   E. Left ventricular function evaluation
      1. Congestive heart failure or a myocardial infarction within the last four weeks AND
         a. An echocardiogram, cardiac MRI, or MUGA was performed but was uninterpretable
   F. Quantitative right ventricular function evaluation
      1. An echocardiogram, cardiac MRI, or MUGA was performed but was uninterpretable
   G. Suspected arrhythmogenic right ventricular dysplasia (ARVD)
      1. ARVD is suspected because of documentation of greater than 1000 ventricular premature contractions/day, ventricular tachycardia, family history of ARVD, or Epsilon waves on the electrocardiogram AND either
         a. No cardiac MRI has been performed and there is a contraindication to MRI
         b. A cardiac MRI was performed and was uninterpretable

III. **Cardiac CT for congenital heart disease (75573) [One of the following]**
   A. Coronary artery anomaly evaluation
1. A cardiac catheterization was performed and not all coronary arteries were identified

B. Thoracic arteriovenous anomaly evaluation
   1. A cardiac MRI or chest CT angiogram was performed and suggested congenital heart disease

C. Complex adult congenital heart disease evaluation [One of the following]
   1. No cardiac CT or cardiac MRI has been performed and there is a contraindication to cardiac MRI
   2. A cardiac CT or cardiac MRI was performed one year ago or more

IV. Cardiac Trauma – Imaging\(^{9-10}\)
A. Any of the following can be used to evaluate cardiac or aortic trauma:
   1. Echocardiogram (TTE, TEE)
   2. Cardiac MRI (CPT® 75557, CPT® 75561, and CPT® 75565)
   3. Cardiac CT (CPT® 75572)
   4. CCTA (CPT® 75574)
   5. Chest CTA (CPT® 71275)

V. Cardiac CT angiography (75574) [One of the following]
A. Evaluation of known coronary artery disease (CAD) [One of the following]
   1. CAD documented by prior imaging stress test, cardiac catheterization, cardiac CT angiogram, coronary revascularization, carotid stenosis or stroke, peripheral artery disease, or aortic aneurysm [One of the following]
      a. New chest pain or shortness of breath [One of the following]
         i. Prior coronary artery bypass grafting and there are no exclusions to cardiac CT angiography
         ii. Medicare only – an imaging stress test or catheterization has not been performed nor is planned to evaluate symptoms and there are there are no exclusions to cardiac CT angiography
   b. No new chest pain or shortness of breath
      i. A left main stent of three mm or more is present and there are no exclusions to cardiac CT angiography
   2. CAD documented by a prior calcium score less than 400
      a. Evaluation of new chest pain or dyspnea, no imaging stress test is planned, and there are no exclusions to cardiac CT angiography

B. Evaluation of newly diagnosed congestive heart failure or cardiomyopathy [Both of the following]\(^{1,3-7}\)
   1. No prior history of coronary artery disease, the ejection fraction is less than 50 percent, and low or intermediate risk on the pre-test probability assessment
   2. No exclusions to cardiac CT angiography
   3. No cardiac catheterization, SPECT, cardiac PET, or stress echocardiogram has been performed since the diagnosis of congestive heart failure or cardiomyopathy

C. Evaluation of suspected coronary artery disease [One of the following]
   1. New or changed chest pain or shortness of breath
a. Contraindication to a routine exercise stress test (inability to exercise, diabetes, digoxin use, poor heart rate response, Wolff-Parkinson-White syndrome, complete left bundle branch block, one mm or more ST-J depression with horizontal or downsloping ST segments 80 msec after the J point, or ventricular paced rhythm)
   i. Low or intermediate risk on the pre-test probability assessment AND
   ii. No exclusions to cardiac CT angiography
b. No contraindications to a routine exercise stress test [One of the following]
   i. Normal routine exercise stress
      01. New or worsening chest pain or shortness of breath, cardiac catheterization is not planned and there are no exclusions to cardiac CT angiography
   ii. Routine exercise stress test abnormal or not performed
      01. Intermediate risk on the pre-test probability assessment and no exclusions to cardiac CT angiography

2. Prior imaging stress test [One of the following]
   a. Normal imaging stress test [All of the following]
      i. New or worsening chest pain or shortness of breath AND
      ii. Cardiac catheterization is not planned AND
      iii. No exclusions to cardiac CT angiography
   b. Abnormal imaging stress test documenting ANY of the following if no exclusions to cardiac CT angiography are present [One of the following]
      i. Normal treadmill with reversible perfusion abnormality or wall motion abnormality including transient ischemic dilatation
      ii. Equivocal
      iii. Abnormal treadmill with normal imaging

3. Evaluation for non-coronary cardiac surgery
   a. Intermediate risk on the pre-test probability assessment and no exclusions to cardiac CT angiography

4. Suspected anomalous coronary artery
   a. Cardiac catheterization was performed, all coronary arteries were not identified, and no exclusions to cardiac CT angiography

*Control-click here for an online ATP risk calculator.*

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

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**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.

References:


<table>
<thead>
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<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>75559</td>
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<tr>
<td>75563</td>
<td>Cardiac MRI for Morphology and Function without Contrast Followed by Contrast Material and Further Sequences; with Stress Imaging</td>
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<td>78454</td>
<td>Myocardial Perfusion Imaging, Planar Rest and/or Stress</td>
</tr>
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<td>93350</td>
<td>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</td>
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<tr>
<td>93351</td>
<td>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</td>
</tr>
</tbody>
</table>
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. New, recurrent or worsening cardiac symptoms AND with any of the following:
   o High pretest probability (greater than 90% probability of CAD)
   o A history of CAD based on:
      • A prior anatomic evaluation of the coronaries OR
      • A history of CABG or PCI
   o Evidence or high suspicion of ventricular tachycardia
   o Age 50 years or greater and known diabetes mellitus
   o Coronary calcium score >/= 400
   o New or previously unrecognized uninterpretable ECG
   o 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.
   o ECG is uninterpretable for ischemia due to any one of the following:
      • Complete Left Bundle Branch Block (bifascicular block involving right bundle
        branch and left anterior hemiblock does not 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:
    - 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. 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:
   - Individual is hemodynamically stable
   - No recurrent chest pain symptoms and no signs of heart failure

   No prior coronary angiography or imaging stress test in regards to the current episode of symptoms

3. 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.

   **NOTE:** MRI, cardiac PET, or MPI can be used to assess myocardial viability depending on physician preference

### Regardless of symptoms, imaging can be approved for the following clinical scenarios:

4. Unheralded syncope (not 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-J 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

<table>
<thead>
<tr>
<th>Pre-Test Probability of CAD by Age, Gender, and Symptoms</th>
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<tr>
<td>Age-Years</td>
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<tr>
<td>----------</td>
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<tr>
<td>Age Range</td>
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<td>30-39</td>
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<tr>
<td>≥60</td>
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</tbody>
</table>

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.

References:


20. Mieres JH and Blumenthal RS. Does the treadmill test work in women? Cardiosource Spotlight July 1, 2008;CS2-CS4


PET MYOCARDIAL IMAGING; POSITRON EMISSION TOMOGRAPHY (PET) METABOLIC EVALUATION

MYOCARDIAL PERFUSION IMAGING, POSITRON EMISSION TOMOGRAPHY (PET) SINGLE STUDY, REST OR STRESS

MYOCARDIAL PERFUSION IMAGING, POSITRON EMISSION TOMOGRAPHY (PET), MULTIPLE STUDIES AT REST AND/OR STRESS

78491 and 78492 are also referred to as a Rubidium study stress test.

I. Non-diagnostic nuclear or echo stress testing
   A. Cardiac catheterization is not planned AND
   B. Any of the following results were present on the nuclear or echo stress testing
      1. Normal treadmill electrocardiogram with reversible perfusion abnormality or wall motion abnormality including transient ischemic dilatation
      2. Equivocal
      3. Positive treadmill electrocardiogram with normal imaging
      4. Technically uninterpretable

II. Evaluation prior to non-cardiac surgery [One of the following]
   A. With current cardiac symptoms
      1. Prior documentation of coronary artery disease (See section III)
      2. No prior documentation of coronary artery disease (See section VI)
   B. Without current cardiac symptoms
      1. Intermediate or high risk non-cardiac surgery
         a. Inability to reach four mets on treadmill exercise stress testing
         b. If able to reach four mets on treadmill exercise stress testing, one of the following must be documented
            i. Creatinine 2.0 or greater
            ii. Diabetes
            iii. Congestive heart failure
            iv. Known coronary artery disease

III. Evaluation of known coronary artery disease\(^1\)\(^6\) [One of the following]
   A. Recent hospitalization for acute myocardial infarction, acute coronary syndrome, or unstable angina
      1. No cardiac catheterization, imaging stress test or cardiac CT angiogram during or since the hospitalization
      2. Recurrent chest pain or shortness of breath since discharge
3. Percutaneous coronary intervention or coronary artery bypass surgery during the hospitalization
   a. No nuclear or echo stress test was performed since the revascularization
   b. A nuclear or echo stress test was performed, but new chest pain or shortness of breath has developed since that study

B. No recent hospitalization for acute myocardial infarction, acute coronary syndrome, or unstable angina
   1. New chest pain or shortness of breath
   2. No new chest pain or shortness of breath [One of the following]
      a. Coronary artery bypass surgery or percutaneous coronary intervention was performed in the last two years and no imaging stress test has been performed after the revascularization
      b. No coronary artery bypass surgery or percutaneous coronary intervention was performed in the last two years and documentation of a prior abnormal imaging stress test, cardiac catheterization, cardiac CT angiogram, percutaneous coronary intervention or bypass surgery, carotid stenosis or stroke, peripheral artery disease, aortic aneurysm, diabetes, or coronary calcification on CT scan [One of the following]
         i. No cardiac catheterization, cardiac CT angiogram, or imaging stress test was performed in the past
         ii. Cardiac catheterization, cardiac CT angiogram, or imaging stress test was performed two or more years ago
      c. Prior documentation of congenital coronary arterial anomalies by cardiac catheterization or cardiac CT angiography and no imaging stress test has been performed since those studies

IV. To assess myocardial viability in patients with severe left ventricular dysfunction as a technique to determine candidacy for a revascularization procedure

V. Clinical suspicion of cardiac sarcoid in patients unable to undergo MRI scanning:
   A. Patients with pacemakers
   B. Patients with automatic implanted cardioverter-defibrillators (AICDs)
   C. Patients with other metal implants

VI. 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

VII. 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 was performed since the new diagnosis of cardiomyopathy
VIII. Evaluation of suspected coronary artery disease symptoms

[One of the following]

A. Evaluation of documented ventricular tachycardia

B. Evaluation of chest pain equivalent [One of the following]
   1. Pre-test probability assessment – high risk
   2. Pre-test probability assessment – low or intermediate risk
      a. Pharmacologic stress test
      b. Electrocardiogram demonstrates Wolff-Parkinson-White syndrome,
         complete left bundle branch block, right bundle branch block, atrial
         fibrillation, left ventricular hypertrophy intraventricular conduction delay,
         ventricular paced rhythm, or one mm or more ST-J depression with
         horizontal or downsloping ST segments for 80 msec after the J point
      c. Currently taking digoxin/Lanoxin®
      d. Routine exercise stress test documents
         i. One mm or more ST-J depression with horizontal or downsloping
            ST segments for 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

C. Evaluation of syncope [One of the following]
   1. Diabetes
   2. ATP* risk calculation 10 percent or more and no imaging stress test has
      been performed in the last two years

IX. Congenital anomalies of the coronary arteries

X. Viability

A. Follow up myocardial perfusion scan within 48 hours of an abnormal
   myocardial perfusion scan to determine if a perfusion defect noted on the
   initial study is scar or viable myocardium is included in 78452 by CPT code
   definition and a second MPI code is not appropriate

B. Recent documented myocardial infarction to determine extent of disease or
   scar

XI. Post transplant cardiac disease

A. Assessment of coronary arteriopathy
**Rule 1: Determination of pretest probability for coronary disease based on chest pain**

<table>
<thead>
<tr>
<th>Age-Years</th>
<th>Gender</th>
<th>Typical/Definite Angina Pectoris</th>
<th>Atypical/Probable Angina Pectoris</th>
<th>Non-anginal Chest Pain</th>
<th>Asymptomatic</th>
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</thead>
<tbody>
<tr>
<td>30-39</td>
<td>Men</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
<td>Very low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>Intermediate</td>
<td>Very low</td>
<td>Very low</td>
<td>Very low</td>
</tr>
<tr>
<td>40-49</td>
<td>Men</td>
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<td>Intermediate</td>
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References:


Medicare LCD References:


8. Local Coverage Determination (LCD) for Myocardial Imaging, Positron Emission Tomography (PET) Scan (L36209), First Coast Service Options, Inc., Florida. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=36209&ver=9&SearchType=Advanced&CoverageSelection=Local&PolicyType=Both&s=12&CntrctlType=13%7c12%7c8%7c9&Cpt HCpcsCode=78459&kq=true&bc=IAAAAAAAADAAA&..

9. Local Coverage Determination (LCD) for Radiopharmaceutical Agents (L34657), Wisconsin Physicians Service Insurance Corporation, Indiana, Michigan. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=34657&ver=11&SearchType=Advanced&CoverageSelection=Local&PolicyType=Both&s=20%7c27&CntrctlType=13%7c12%7c8%7c9&Cpt HCpcsCode=78459&kq=true&bc=IAAAAAAAADAAA&..

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11. Local Coverage Determination (LCD) for Cardiac Radionuclide Imaging (L33457), Palmetto GBA, North Carolina, South Carolina, Virginia, West Virginia. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=33457&ver=20&SearchType=Advanced&CoverageSelection=Local&PolicyType=Both&s=34%7c48%7c53%7c58&CntrctlType=13%7c12%7c8%7c9&Cpt HCpcsCode=78491&kq=true&bc=IAAAAAAAADAAA&

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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 attach 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
References:


Medicare LCD References:

3. Local Coverage Determination (LCD) for Transthoracic Echocardiography (TTE) (L33577), National Government Services, Inc., Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=33577&ver=11&SearchType=Advanced&CoverageSelection=Local&PolicyType=Final&s=9%7c26%7c24%7c27%7c63%7c70%7c64%7c65%7c47%7c55&CntrctrType=13%7c12%7c9&CptHcpcsCode=93303&kq=true&bc=IAAAAAAA%3d%3d%3d&.

4. Local Coverage Determination (LCD) for Transthoracic Echocardiography (TTE) (L35016), Novitas Solutions, Inc., Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=35016&ver=10&SearchType=Advanced&CoverageSelection=Local&PolicyType=Final&s=3%7c8%7c23%7c31%7c39%7c43%7c51&CntrctrType=13%7c12%7c9&KeyWord=Transthoracic+Echocardiography&KeyWordLookUp=Doc&KeyWordSearchType=Exact&kq=true&bc=IAAAAAAA%3d%3d%3d&.


6. Local Coverage Determination (LCD) for Transthoracic Echocardiography (TTE) (L33577), National Government Services, Inc., Illinois, Minnesota, Wisconsin. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=33577&ver=11&SearchType=Advanced&CoverageSelection=Local&PolicyType=Final&s=9%7c26%7c24%7c27%7c63%7c70%7c64%7c65%7c47%7c55&CntrctrType=13%7c12%7c9&CptHcpcsCode=93303&kq=true&bc=IAAAAAAA%3d%3d&.

7. Local Coverage Determination (LCD) for Transthoracic Echocardiography (TTE) (L34338), CGS Administrators, LLC, Kentucky, Ohio. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=34338&ver=10&SearchType=Advanced&CoverageSelection=Local&PolicyType=Final&s=2%7c42&CntrctrType=13%7c12%7c9&CptHcpcsCode=93303&kq=true&bc=IAAAAAAA%3d%3d&.

8. Local Coverage Determination (LCD) for Transthoracic Echocardiography (TTE) (L33472), Palmetto GBA, North Carolina, South Carolina, Virginia, West Virginia. https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=33472&ver=11&SearchType=Advanced&CoverageSelection=Local&PolicyType=Final&s=3%7c48%7c53%7c58&CntrctrType=13%7c12%7c9&CptHcpcsCode=93303&kq=true&bc=IAAAAAA%3d%3d&.
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
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<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>93458</td>
<td><strong>Catheter Placement in Coronary Artery(s) for Coronary Angiography</strong>, including Intraprocedural Injection(s) for Coronary Angiography, Imaging Supervision and Interpretation; with Left Heart Catheterization Including Intraprocedural Injection(s) for Left Ventriculography, when performed.</td>
</tr>
<tr>
<td>93459</td>
<td><strong>Catheter Placement in Coronary Artery(s) for Coronary Angiography</strong>, 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 By-pass Graft(s) (Internal Mammary, Free Arterial, Venous Grafts) with By-pass Graft Angiography.</td>
</tr>
<tr>
<td>93460</td>
<td><strong>Catheter Placement in Coronary Artery(s) for Coronary Angiography</strong>, 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.</td>
</tr>
<tr>
<td>93461</td>
<td><strong>Catheter Placement in Coronary Artery(s) for Coronary Angiography</strong>, 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 By-pass Graft(s) (Internal Mammary, Free Arterial, Venous Grafts) with By-pass Graft Angiography.</td>
</tr>
</tbody>
</table>

### I. Evaluation of Acute Coronary Syndrome [One]

#### 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 dilation
      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

<table>
<thead>
<tr>
<th>Age-Years</th>
<th>Gender</th>
<th>Typical/Definite Angina Pectoris</th>
<th>Atypical/Probable Angina Pectoris</th>
<th>Non-anginal Chest Pain</th>
<th>Asymptomatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39</td>
<td>Men</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
<td>Very low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>Intermediate</td>
<td>Very low</td>
<td>Very low</td>
<td>Very low</td>
</tr>
<tr>
<td>40-49</td>
<td>Men</td>
<td>High</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>Intermediate</td>
<td>Low</td>
<td>Very low</td>
<td>Very low</td>
</tr>
<tr>
<td>50-59</td>
<td>Men</td>
<td>High</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
<td>Very low</td>
</tr>
<tr>
<td>≥60</td>
<td>Men</td>
<td>High</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>High</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Low</td>
</tr>
</tbody>
</table>

- **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.
References:


Medicare LCD References: