



MASSACHUSETTS

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Medical Policy

Nuclear Cardiology Myocardial Perfusion Imaging

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Policy Number: 836

BCBSA Reference Number: N/A

Related Policies

- **Medicare Advantage: High-Technology Radiology and Sleep Disorder Management Clinical and Utilization Guidance Redirect, #923**
- Nuclear Cardiology Cardiac Blood Pool Imaging Blood Pool Imaging includes MUGA (Multi-Gated Acquisition) & First Pass Radionuclide Ventriculography, #830
- Nuclear Cardiology Infarct Imaging, #834

Policy¹

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity

Myocardial Perfusion Imaging is considered **MEDICALLY NECESSARY** for the following conditions:

Suspected coronary artery disease in asymptomatic patients

- Patients with high-risk of CAD (SCORE) who have not had evaluation of coronary artery disease (MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization) within the preceding three (3) years; **OR**
- Patients with moderate or high risk of CAD (SCORE) who have a high risk occupation that would endanger others in the event of a myocardial infarction, for example: airline pilot, law-enforcement officer, firefighter, mass transit operator, bus driver) who have not had evaluation of coronary artery disease (MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization) within the preceding three (3) years; **OR**
- Patients with diseases/conditions with which coronary artery disease commonly coexist and who have not had evaluation of coronary artery disease (MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization) within the preceding three (3) years:
 - Diabetes mellitus; **OR**
 - Abdominal aortic aneurysm; **OR**
 - Established and symptomatic peripheral vascular disease; **OR**
 - Prior history of cerebrovascular accident (CVA), transient ischemic attack (TIA) or carotid endarterectomy (CEA) or high grade carotid stenosis (>70%); **OR**
 - Chronic renal insufficiency or renal failure; **OR**

- Patients who have undergone cardiac transplantation and have had no evaluation for coronary artery disease within the preceding one (1) year; **OR**
- Patients in whom a decision has been made to treat with interleukin 2
- Patients awaiting solid organ transplantation who have not undergone evaluation for coronary artery disease within the preceding one (1) year

Suspected coronary artery disease in symptomatic patients who have not had evaluation of coronary artery disease (MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization) within the preceding sixty (60) days

- Chest pain
 - With intermediate or high pretest probability of CAD (*Table 1); **OR**
 - With low or very low pretest probability of CAD (*Table 1) and high risk of CAD (SCORE)
- Atypical symptoms: syncope, shortness of breath (dyspnea), neck, jaw, arm, epigastric or back pain, or sweating (diaphoresis)
 - With moderate or high risk of CAD (SCORE)
- Other symptoms; palpitation, dizziness, lightheadedness, near syncope, nausea, vomiting, anxiety, weakness, fatigue, etc.
 - With high risk of CAD (SCORE)
- Patients with any cardiac symptom who have diseases/conditions with which coronary artery disease commonly coexists such as:
 - Diabetes mellitus; **OR**
 - Abdominal aortic aneurysm; **OR**
 - Established and symptomatic peripheral vascular disease; **OR**
 - Prior history of cerebrovascular accident (CVA), transient ischemic attack (TIA) or carotid endarterectomy (CEA) or high grade carotid stenosis (>70%); **OR**
 - Chronic renal insufficiency or renal failure; **OR**
- Patients who have undergone cardiac transplantation; **OR**
- Patients in whom a decision has been made to treat with Interleukin 2; **OR**
- Patients awaiting solid organ transplantation

Table 1:* Pre-Test Probability of Coronary Artery Disease by Age, Gender and Symptoms

| | |
|-----------------------|---------------------------------|
| Very Low < 5% | Intermediate probability 10-90% |
| Low Probability < 10% | High Probability > 90% |

*Reference for Table 1: Gibbons RJ, Balady GJ, Beasley JW, et al. ACC/AHA Guidelines for Exercise Testing: Executive Summary. Circulation. 1997;96:345-354.

| Age (yr) | 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 |
| 60-69 | Men | High | Intermediate | Intermediate | Low |
| | Women | High | Intermediate | Intermediate | Low |

Established coronary artery disease in asymptomatic patients

- Patients awaiting solid organ transplantation who have not undergone evaluation for coronary artery disease within the preceding one (1) year

Established coronary artery disease (diagnosed by previous cardiac catheterization, MPI, cardiac PET, or stress echo) in patients who have new or worsening symptoms

Note: *If symptoms are typical of myocardial ischemia cardiac catheterization may be more appropriate than MPI*

Established coronary artery disease (diagnosed by previous cardiac catheterization, MPI, cardiac PET, or stress echo) in patients who have not undergone revascularization and have no symptoms or stable symptoms

- No evaluation of CAD (MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization) within the preceding three (3) years
- No evaluation of CAD (MPI, cardiac PET, stress echo, coronary CTA or cardiac catheterization) within the preceding one (1) year in a patient who has undergone cardiac transplantation and has been found to have CAD since transplantation

Established coronary artery disease in patients who have undergone revascularization

- For evaluation of new or worsening cardiac symptoms
 - If symptoms are typical of myocardial ischemia cardiac catheterization may be more appropriate than MPI; **OR**
- For evaluation of stable patients who have undergone coronary artery bypass grafting more than five (5) years previously and who have not had an evaluation for coronary artery disease (MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization) within the past two (2) years
 - Stable patients whose revascularization has been incomplete may undergo MPI three (3) years following the procedure and every three (3) years thereafter; **OR**
- For evaluation of stable patients who have undergone percutaneous coronary intervention (PCI) more than three (3) years previously and who have not had an evaluation for coronary artery disease (MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization) within the past three (3) years when **any of the following** applies
 - The patient has undergone PCI of the left main (LM) coronary artery or the proximal left anterior descending (LAD) coronary artery
 - The patient has undergone PCI of more than one coronary artery
 - The patient has chronic total occlusion of a coronary artery and the vessel on which PCI was performed is supplying collateral flow to the occluded vessel
 - The patient is known to have only one patent coronary artery.
 - Left ventricular ejection fraction LVEF is <35%

Established coronary artery disease in patients who have had myocardial infarction (ST elevation or non-ST elevation) or unstable angina within the preceding ninety (90) days provided that:

- The patient did not undergo coronary angiography at the time of the acute event; **AND**
- The patient is currently clinically stable

Established Kawasaki Disease with Coronary Artery Involvement

- Every two year evaluation for confirmed small to medium coronary artery aneurysm
- Annual evaluation for confirmed large (giant) coronary artery aneurysm, multiple or complex aneurysms or coronary artery obstruction confirmed by angiography

Patients with new onset arrhythmias (patient can be symptomatic or asymptomatic)

This guideline applies to patients with suspected or established CAD

- Patients with sustained (lasting more than 30 seconds) or non-sustained (more than 3 beats but terminating within 30 seconds) ventricular tachycardia; **OR**
- Patients with atrial fibrillation or flutter and high or moderate risk of CAD (SCORE); **OR**
- Patients with atrial fibrillation or flutter and established CAD; **OR**
- Patients who have frequent premature ventricular contractions (PVC) defined as more than thirty (30) PVCs per hour on ambulatory EKG (Holter) monitoring
 - It is not clinically indicated to perform MPI for evaluation of infrequent premature atrial or ventricular depolarizations

Patients with new onset congestive heart failure or recently recognized left ventricular systolic dysfunction (patient can be symptomatic or asymptomatic)

This guideline applies to patients with suspected or established CAD

For patients in this category whose CAD risk (SCORE) is high, cardiac catheterization may be more appropriate than noninvasive evaluation

- Provided that new or worsening CAD has not been excluded as the cause of LV dysfunction/ CHF by any of the following tests: MPI, stress echo, cardiac PET, coronary CTA or cardiac catheterization

Patients with abnormal exercise treadmill test (performed without imaging)

This guideline applies to patients with suspected or established CAD

- Abnormal findings on an exercise treadmill test include (chest pain, ST segment change, abnormal BP response or complex ventricular arrhythmias)

Patients who have undergone recent (within the past 60 days) stress echocardiography

- When the stress echocardiogram is technically suboptimal, technically limited, inconclusive, indeterminate, or equivocal, such that myocardial ischemia cannot be adequately excluded
 - It is not appropriate to perform MPI on patients who have had a recent normal or abnormal stress echocardiogram
 - A stress echocardiogram is deemed to be abnormal when there are echocardiographic abnormalities.
Electrocardiographic abnormalities without echocardiographic evidence of ischemia are considered to be normal studies

Patients with abnormal findings on cardiac CT / coronary CTA

Symptomatic Patients:

- With coronary artery calcium score > 400 Agatston units; **OR**
- Intermediate severity coronary stenosis on coronary CTA

Note: If symptoms are typical of myocardial ischemia cardiac catheterization may be more appropriate than MPI

Asymptomatic patients who have not had MPI, stress echo, cardiac PET or cardiac catheterization within the preceding three (3) years:

- With coronary artery calcium score > 400 Agatston units; **OR**
- Intermediate severity coronary stenosis coronary CTA

Patients with abnormal findings on cardiac catheterization

- To determine flow limiting significance of intermediate coronary stenosis

Myocardial viability evaluation

MPI may be used to evaluate myocardial viability in patients who

- Have established coronary artery disease; **AND**
- Have left ventricular systolic dysfunction (Left Ventricular Ejection Fraction <55%); **AND**
- Are candidates for revascularization

Note: Pharmacologic stress echocardiography with a drug such as dobutamine that increases myocardial contractility is the preferred protocol

Pre-operative cardiac evaluation of patients undergoing non-cardiac surgery

This guideline applies to patients undergoing non-emergency surgery

It is assumed that those who require emergency surgery will undergo inpatient pre-operative evaluation

- Patients with active cardiac conditions such as unstable coronary syndromes (unstable angina), decompensated heart failure (NYHA function of class IV, worsening or new onset heart failure), significant arrhythmias (third degree AV block Mobitz II AV block, uncontrolled supraventricular arrhythmia, symptomatic ventricular arrhythmias, ventricular tachycardia), symptomatic bradycardia

or severe stenotic valvular lesions. It is recommended that these conditions be evaluated and managed per ACC/AHA guidelines prior to considering elective surgery. That evaluation may include MPI

Low-risk surgery (endoscopic procedures, superficial procedures, cataract surgery, breast surgery, ambulatory surgery)

- Provided that there are no active cardiac conditions (as outlined above), MPI prior to low-risk surgery is considered not medically necessary

Intermediate risk surgery (including but not limited to intraperitoneal and intrathoracic surgery, carotid endarterectomy, head and neck surgery, orthopedic surgery, prostate surgery, gastric bypass surgery) or **High-risk surgery** (including but not limited to aortic and other major vascular surgery, peripheral vascular surgery) when

- The patient has not had a normal coronary angiogram, SE, MPI, CCTA, Cardiac PET perfusion study or revascularization procedure within the previous one (1) year; **AND**
- At least one of the following applies:
 - Patient has established CAD (prior MI, prior PTCA, stent, or CABG) or presumed CAD (Q waves on EKG, abnormal MPI, SE or cardiac PET); **OR**
 - Patient has compensated heart failure or prior history of heart failure (CHF); **OR**
 - Patient has diabetes mellitus; **OR**
 - Patient has chronic renal insufficiency or renal failure; **OR**
 - Patient has a history of cerebrovascular disease (TIA, CVA or documented carotid stenosis requiring carotid endarterectomy); **OR**
 - Patient is unable to walk on a treadmill for reasons other than obesity

Abnormal EKG findings

Some patients have resting EKG findings which would render the interpretation of an exercise EKG test difficult or impossible.

In these situations patients who, in the absence of the EKG abnormality, would not meet approval criteria for MPI, may be approved for MPI because exercise EKG testing without imaging would provide little clinically useful data. Patients with the following resting EKG abnormalities are included this category:

- Left bundle branch block; **OR**
- Ventricular paced rhythm; **OR**
- Left ventricular hypertrophy with repolarization abnormality; **OR**
- Digoxin effect; **OR**
- 1 mm ST depression or more on a recent EKG (within the past 30 days); **OR**
- Pre-excitation syndromes (E.G. WPW syndrome)

Unable to walk on a treadmill for reasons other than obesity

Prior Authorization Information

Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

| | Outpatient |
|--|--|
| Commercial Managed Care (HMO and POS) | The requirements of BCBSMA Radiology Management Program may require a precertification/prior authorization via AIM Specialty Health. These requirements are member-specific: |
| Commercial PPO | Please verify member eligibility and requirements through Online Services by |

| | |
|----------------------|--|
| and Indemnity | <p>logging onto Provider Central. Refer to our Quick Tip for an overview of pre-certification and prior authorization requirements.</p> <p>Ordering clinicians should request pre-certification from AIM Specialty Health or call 1-866-745-1783 (when applicable).</p> <p>Prior authorization information for Medicare HMO Blue and Medicare PPO Blue is addressed in medical policy #923, High Technology Radiology and Sleep Disorder Management for Medicare Advantage Products.</p> |
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CPT Codes / HCPCS Codes

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:

CPT Codes

| CPT codes: | Code Description |
|------------|---|
| 78451 | Myocardial perfusion imaging, tomographic (SPECT) (including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); single study, at rest or stress (exercise or pharmacologic) |
| 78452 | Myocardial perfusion imaging, tomographic (SPECT) (including attenuation correction, qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); multiple studies, at rest and/or stress (exercise or pharmacologic) and/or redistribution and/or rest reinjection |
| 78453 | Myocardial perfusion imaging, planar (including qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); single study, at rest or stress (exercise or pharmacologic) |
| 78454 | Myocardial perfusion imaging, planar (including qualitative or quantitative wall motion, ejection fraction by first pass or gated technique, additional quantification, when performed); multiple studies, at rest and/or stress (exercise or pharmacologic) and/or redistribution and/or rest reinjection |

Policy History

| Date | Action |
|-----------|---|
| 8/2018 | Table 1: Pre-Test Probability of Coronary Artery Disease by Age, Gender and Symptoms clarified. |
| 1/2018 | Prior authorization information for Medicare HMO Blue and Medicare PPO Blue removed. Prior authorization information for Medicare HMO Blue and Medicare PPO Blue is addressed in Medical Policy #923, High Technology Radiology and Sleep Disorder Management for Medicare Advantage Products. 1/1/2018 |
| 5/2017 | Prior Authorization Information clarified. 5/1/2017 |
| 10/1/2016 | New medical policy describing medically necessary indications. Effective 10/1/2016. Adopted AIM Clinical Appropriateness Guidelines: Advanced Imaging: Cardiac Imaging |

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|--------------------------------|
| Effective Date: March 1, 2016. |
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Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

References

N/A

Endnotes

¹ Based on AIM Clinical Appropriateness Guidelines: Advanced Imaging: Cardiac Imaging.