



## MASSACHUSETTS

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### Medical Policy

## Positron Emission Tomography (PET) Myocardial Imaging

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### Policy Number: 837

BCBSA Reference Number: N/A

### Related Policies

- **Medicare Advantage: High-Technology Radiology and Sleep Disorder Management Clinical and Utilization Guidance Redirect, #923**
- Positron Emission Tomography, Other PET Applications, Including Oncologic Tumor Imaging, #229
- Positron Emission Tomography (PET) Brain Imaging, #903

### Policy<sup>1</sup>

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

#### PET Perfusion Imaging

PET perfusion imaging is considered **MEDICALLY NECESSARY** as the initial noninvasive stress imaging test for suspected or established CAD for patients who have a relative contraindication(s) to conventional nuclear perfusion imaging (Table 1) and/or a contraindication to exercise stress testing (Table 2) who meet any of the indications for stress testing outlined below.

<b>Table 1. Relative contraindications to conventional nuclear perfusion imaging</b>
Morbid obesity (BMI > or = 40 kg/m <sup>2</sup> )
Breast implant(s) in situ
Previous suboptimal conventional nuclear perfusion imaging which was suboptimal due to attenuation artifact
Previous conventional nuclear imaging discordant with coronary angiographic findings
Known pericardial or pleural effusion
Prior mastectomy

Chest wall deformity
<b>Table 2. Contraindications to exercise stress testing</b>
<ol style="list-style-type: none"> <li>1. Resting EKG abnormalities <ol style="list-style-type: none"> <li>a. Complete left bundle branch block LBBB</li> <li>b. Electronically paced ventricular rhythm</li> <li>c. Resting ST depression &gt; 1mm</li> <li>d. Left ventricular hypertrophy (LVH) with secondary repolarization abnormalities</li> <li>e. Digoxin effect</li> <li>f. Pre-excitation (e.g. Wolfe Parkinson White syndrome)</li> <li>g. Previous false positive EKG stress test</li> </ol> </li> </ol>
<ol style="list-style-type: none"> <li>2. Conditions limiting exercise capacity such that target heart rate (HR) is unlikely to be achieved <ol style="list-style-type: none"> <li>a. Orthopedic or neurological impairment</li> <li>b. Severe COPD</li> <li>c. Severe heart failure</li> <li>d. Severe claudication</li> <li>e. Prior failure to achieve target HR</li> <li>f. Use of negatively chronotropic medications which cannot be temporarily withheld for testing</li> </ol> </li> </ol>
<ol style="list-style-type: none"> <li>3. Severe valvular stenosis</li> </ol>
<ol style="list-style-type: none"> <li>4. Presence of an implanted cardioverter-defibrillator (ICD)</li> </ol>

**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

**Established coronary artery disease in asymptomatic patient**

- 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 perfusion PET imaging*

**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 policy 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 perfusion PET imaging 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 policy 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 non-invasive 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 policy 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 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

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

This policy applies to patients undergoing non-emergency surgery

It is assumed that those who require emergency surgery will undergo inpatient preoperative 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)

**PET perfusion imaging is appropriate in follow up to other noninvasive stress imaging tests in the following situations:**

**Patients who have undergone recent (within the past 60 days) stress echocardiography or conventional nuclear perfusion imaging**

- When the initial test is technically suboptimal, technically limited, inconclusive, indeterminate, or equivocal, such that myocardial ischemia cannot be adequately excluded
  - It is not appropriate to perform PET perfusion imaging on patients who have had a recent normal or abnormal stress echocardiogram or conventional nuclear perfusion imaging test
  - An initial stress imaging test is deemed to be abnormal when there are echocardiographic or perfusion abnormalities. Studies with electrocardiographic abnormalities without echocardiographic or perfusion evidence of ischemia are considered to be normal studies

**PET perfusion imaging – sarcoidosis:**

**PET perfusion imaging is appropriate in the evaluation of patients with suspected or established cardiac sarcoidosis when performed in conjunction with metabolic PET imaging**

### **Metabolic PET Imaging**

**Metabolic PET imaging for evaluation of myocardial viability – when all four of the following conditions are met:**

- The patient has established coronary artery disease; **AND**
- Left ventricular systolic dysfunction; **AND**
- Viability status is not defined by other testing; **AND**
- Revascularization is being considered

### Metabolic PET imaging for evaluation of non-coronary cardiac diseases

- Metabolic PET imaging (with or without perfusion imaging) may be used in the diagnosis or management of cardiac sarcoidosis

### 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
<b>Commercial Managed Care (HMO and POS)</b>	The requirements of BCBSMA Radiology Management Program may require a precertification/prior authorization via AIM Specialty Health. These requirements are member-specific:
<b>Commercial PPO and Indemnity</b>	<p>Please verify member eligibility and requirements through <b>Online Services</b> by logging onto <a href="#">Provider Central</a>. Refer to our <a href="#">Quick Tip</a> for an overview of precertification and prior authorization requirements.</p> <p>Ordering clinicians should request pre-certification from <a href="#">AIM Specialty Health</a> or call 1-866-745-1783 (when applicable).</p> <p>Prior authorization information for Medicare HMO Blue and Medicare PPO Blue is addressed in <a href="#">medical policy #923, High Technology Radiology and Sleep Disorder Management for Medicare Advantage Products</a>.</p>

### CPT Codes / HCPCS Codes / ICD 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
78459	PET myocardial, metabolic evaluation
78491	PET myocardial perfusion, single study
78492	PET myocardial perfusion, multiple studies

### Policy History

Date	Action
8/2018	Clarified coding information.
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 <a href="#">#923, High Technology Radiology and Sleep Disorder Management for Medicare Advantage Products</a> . 1/1/2018
11/2017	Medically necessary criteria revised. Effective 11/20/2017. Based on AIM Clinical Appropriateness Guidelines: Advanced Imaging: Cardiac Imaging. Effective Date: November 20, 2017.
10/2017	Clarified coding information.
8/2017	National Coverage Determination (NCD) for PET for Perfusion of the Heart (220.6.1) added for Medicare Advantage members. 8/1/2017 National Coverage Determination (NCD) for FDG PET for Myocardial Viability (220.6.8) added for Medicare Advantage members. 8/1/2017
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 Effective Date: March 1, 2016.

## 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

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## Endnotes

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<sup>1</sup> Based on AIM Clinical Appropriateness Guidelines: Advanced Imaging: Cardiac Imaging.