National Imaging Associates, Inc.	
Clinical guidelines MYOCARDIAL PERFUSION IMAGING HEART (CARDIAC) PET SCAN STRESS ECHOCARDIOGRAM (Non-emergent outpatient testing)	Original Date: October 2015 Page 1 of 14 "FOR CMS (MEDICARE) MEMBERS ONLY"
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"FOR CMS (MEDICARE) MEMBERS ONLY"

Coverage Indications, Limitations, and/or Medical Necessity

Noninvasive testing in the outpatient setting to assess coronary artery disease (CAD) and left ventricular (LV) dysfunction may be accomplished utilizing conventional exercise testing or by measuring the distribution of nuclear medicine reagents during physiologic or pharmacologic stress.

Cardiovascular stress testing, also called an exercise stress test (EST), exercise electrocardiogram, exercise treadmill test (ETT), graded exercise test, or stress electrocardiogram (ECG), is used to provide information about how the heart responds to exertion. It usually involves walking on a treadmill or pedaling a stationary bike at increasing levels of difficulty, while the electrocardiogram, heart rate, and blood pressure are monitored. The same measurement may be obtained with the substitution of echocardiography for a standard ECG. Echocardiography is used to image cardiac structures and function and also flow direction and velocities within cardiac chambers and vessels. Usually these images are obtained from several positions on the chest wall and abdomen using a hand-held transducer.

In many instances, exercise testing (without imaging) may be combined with imaging procedures, such as myocardial perfusion imaging, radionuclide ventriculography, echocardiography, or other imaging procedures.

There are 3 principle types of stress tests which do not involve the measurement of radio-labelled distribution within the body. These include:

• Exercise stress test (EST) is normally the first stress test performed. The patient walks on a treadmill or similar device while being monitored to measure endurance with an end-point of symptoms, ECG, or echocardiographic changes that suggest coronary under-

perfusion. EST is without imaging. An EST must include an ECG that can be interpreted for ischemia, and the patient must be capable of exercise on a treadmill or similar device generally at 4 METs or greater (i.e., able to walk four blocks without stopping, can climb two flights of stairs without stopping). An abnormal EST includes any one of the following: ST segment depression, development of chest pain, significant arrhythmia (especially ventricular arrhythmia), or hypotension.

• Dobutamine, Dipyridamole, or Adenosine Stress Test is used in people who are unable to exercise. A drug is given to make the heart respond as if the person were exercising. This way the doctor can still determine how the heart responds to stress, but no exercise is required.

• Stress echocardiogram is a graphic outline of the heart's movement. A stress echo can accurately visualize the motion of the heart's walls and pumping action when the heart is stressed; it may reveal a lack of blood flow that isn't always apparent on other heart tests.

The main task of Nuclear Cardiology and Nuclear Medicine is not the representation of anatomy, as in traditional Diagnostic Radiology; rather, it is the non-invasive visualization of functional, metabolic processes. In diagnostic Nuclear Medicine, the subject first incorporates tracer amounts of a radioactively-labelled molecule. Once the tracer molecule is properly distributed inside the body, imaging techniques visualize the metabolism of the substance by measuring the distribution of the radioactively-labelled molecule through externally emitted radiation.

Myocardial perfusion imaging (MPI) SPECT is a cardiac radionuclide imaging procedure that evaluates blood flow to the cardiac muscle. MPI is usually performed with exercise ECG testing for detecting coronary artery disease and determining prognosis using a gamma camera to record images in planar or tomographic (single photon emission computed tomography) (SPECT) projections. Use of dual radiopharmaceuticals permits concurrent studies at rest and after stress, which is then compared and interpreted by a nuclear physician. Since the radiopharmaceutical accumulates in the myocardium in relation to blood flow, ischemic and infarcted myocardium can be detected. The specific imaging technique (perfusion versus ventricular function) and the reason for the imaging determines what radionuclide agent is employed. A perfusion study utilizes an imaging isotope agent that reflects myocardial blood flow and, dependent on the agent and timing of image acquisition, the presence of scar and/or ischemia. Ventricular function studies utilize specific imaging isotopes to outline the borders of the left ventricular endocardium or to identify the ventricular blood pool independent of the surrounding myocardium. The motion of the left ventricle is synchronized with the electrocardiogram to generate wall motion and ejection fraction information. In instances where an exercise test cannot be performed, Dipyridamole, Adenosine, Dobutamine or other provocative agents may be used to alter coronary flow, thereby unmasking a suspected lesion in the coronary bed.

Cardiac PET (positron emission tomography) myocardial perfusion imaging is another cardiac radionuclide imaging procedure in which radioactive tracers are used to diagnose

patients with suspected coronary artery disease (CAD) and provide important risk stratification of patients with known CAD. This test is also a valuable tool to assess myocardial viability, myocardial wall motion and ejection fraction, as well as, cardiac sarcoidosis. For diagnosis, radionuclides are administered intravenously and distribute in proportion to the regional myocardial blood flow present at the time of injection. In selected patients, cardiac PET offers certain advantages over standard of care Single Photon Emission Computed Tomography Myocardial Perfusion Imaging (SPECT MPI). Cardiac PET is a useful technique that allows a noninvasive evaluation of myocardial blood flow, function, and metabolism, using physiological substrates prepared with positron-emitting radionuclides, such as oxygen, nitrogen, fluorine, and rubidium. These radionuclides have half-lives that are considerably shorter than those used in SPECT. Positron-emitting radionuclides are produced either using a cyclotron, such as fluoro-2-deoxyglucose (F-18 FDG) with a 110-minute half-life, or nitrogen-13-ammonia (N-13), with a half-life of 9.8 minutes or a generator such as rubidium-82 (Rb-82) with a 75-second half-life. Because of availability, the most common PET blood flow tracer is rubidium-82. The goal of cardiac PET perfusion imaging is to detect physiologically significant coronary artery narrowing. Results of the test should lead toward risk factor modification in order to delay or reverse the progression of atherosclerosis, alleviate symptoms of ischemia, and improve patient survival by either medical therapy or revascularization procedures such as bypass surgery (CABG) or percutaneous coronary intervention (PCI). Stress and rest paired myocardial perfusion studies are commonly performed to assess myocardial ischemia and/or infarction. Current Food and Drug Administration (FDA)-approved and Centers for Medicare and Medicaid Services-covered PET myocardial blood flow tracers are limited to Rb-82, F-18 FDG, and N-13 ammonia. Normal MPI implies the absence of significant CAD. Abnormal myocardial perfusion on stress imaging suggests the presence of significantly narrowed coronary arteries. If the stress regional perfusion defect is absent on the corresponding rest images, it suggests the presence of stress-induced myocardial ischemia. If the stress perfusion defect persists at rest, it suggests prior infarction. Imaging of myocardial perfusion can also be combined with myocardial metabolism imaging with F-18FDG for the assessment of myocardial viability in areas of resting hypoperfusion and dysfunctional myocardium. The stress protocols are, for the most part, similar for all cardiac PET perfusion agents. The specific differences in acquisition protocols for Rb-82 and N-13 are related to the duration of uptake and clearance of these radiopharmaceuticals and their physical half-lives.

Indications:

A cardiovascular stress test (pharmacologic and non-pharmacologic) will be considered medically reasonable and necessary for the following conditions:

Stress Testing without Imaging: For the diagnosis of suspected and prognosis of coronary artery disease in patients with normal or minor changes in resting ECG and no contraindications to exercise.

Stress Testing with Imaging:

Imaging stress tests addressed in this LCD include stress echocardiography and SPECT or PET nuclear myocardial perfusion imaging (MPI).

Stress testing with imaging can be performed with maximal exercise or chemical stress (dipyridamole, dobutamine, adenosine or adenosine analogs).

Stress echo and SPECT MPI are considered equivalent diagnostic tests. However, in addition to myocardial ischemia, stress echo can provide additional information that is not obtainable with MPI, such as valve function, assessment of pulmonary pressure, and assessment of dynamic obstruction. The most commonly performed myocardial perfusion imaging are single (at rest or stress, CPT code 78451) and multiple (at rest and stress, CPT code 78452) tomographic SPECT studies. Evaluation of the individual's left ventricular wall motion and ejection fractions are routinely performed during SPECT MPI and are included in the code's definition. Attenuation correction, when performed, is included in the MPI service.

When symptoms are present, and there is sufficient suspicion of heart disease to warrant cardiac evaluation, it is expected that the provider make a probability estimate of the likelihood of CAD prior to selecting testing. Assessment of coronary artery disease can be determined by the following:

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

Atypical angina (probable): Chest pain or discomfort (arm or jaw pain) 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.

Anginal variants or equivalents: A manifestation of myocardial ischemia, which is perceived by patients to be (otherwise unexplained) dyspnea, unusual fatigue, more often seen in women and may be unassociated with chest pain.

Age, gender, and the character of the chest pain provide useful predictors of CAD. Refer to the following table for cardiac imaging guidelines.

Pre-test probability of CAD by age, gender, and symptoms:

Age (yr)	Gender	Typical/Definite Angina Pectoris	Atypical/Probable Angina Pectoris	Non-Anginal Chest Pain	Asymptomatic
≤39	Men	Intermediate	Intermediate	Low	Very Low

	Women	Intermediate	Very Low	Very Low	Very Low
40-49	Men	High	Intermediate	Intermediate	Low
	Women	Intermediate	Low	Very Low	Very Low
50-59	Men	High	Intermediate	Intermediate	Low
	Women	Intermediate	Intermediate	Low	Very Low
≥60	Men	High	Intermediate	Intermediate	Low
	Women	High	Intermediate	Intermediate	Low

High: Greater than 90% pre-test probability

Intermediate: Between 10% and 90% pre-test probability

Low: Between 5% and 10% pre-test probability

Very Low: Less than 5% pre-test probability

In summary, the choice of stress testing modality depends on many factors such as the patient's ability to exercise, the resting ECG, the clinical indication for performing the test, the patient's body habitus, and history of prior revascularization.

The following are considered medically necessary for either the stress echo or SPECT MPI:

1. New, recurrent, or worsening cardiac symptoms **AND** any of the following:
   - Physical inability to perform a maximum exercise workload
   - A history of CAD based on a prior anatomic evaluation of the coronary arteries OR a history of CABG or PCI
   - Syncope (i.e., no prodromal symptoms, not near syncope) in patient with high likelihood of CAD
   - Evidence or high suspicion of ventricular tachycardia
   - Age 50 years or greater and known diabetes mellitus
   - New or previously unrecognized uninterpretable ECG
   - Poorly controlled hypertension, generally, above 180 mm/Hg systolic, if the provider feels strongly that CAD needs evaluation prior to BP being controlled
   - ECG is uninterpretable for ischemia due to any one of the following:
     - Complete Left Bundle Branch Block (right bundle branch 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
- Worsening or continuing symptoms in a patient who had a normal or submaximal exercise stress test and there is suspicion of a false negative result
- Patients with recent equivocal or borderline testing where ischemia remains a concern
- Patients on beta blocker, calcium channel blocker, and/or antiarrhythmic medication when the documentation supports that an adequate workload may not be attainable to enable a fully diagnostic exercise study
- History of false positive exercise stress test (e.g., one that is abnormal, but the abnormality does not appear to be due to macrovascular CAD)
- High pretest probability of CAD (assuming emergency evaluation and/or prompt coronary angiography not previously implemented)

2. Patients without clear cardiac symptoms in the presence of an elevated cardiac troponin

3. Routine study > 3 years after a PCI (stent) without cardiac symptoms and absent an evaluation for CAD within the past 2 years (stress echo, MPI SPECT, cardiac PET, coronary computed tomography angiography (CCTA), cardiac catheterization)

4. Routine study > 5 years after CABG without cardiac symptoms in a patient who has not had an evaluation for CAD within the past 2 years (stress echo, MPI SPECT, cardiac PET, coronary computed tomography angiography (CCTA), cardiac catheterization)

5. Every 2 years in patients with documentation of previous "silent ischemia" (and diabetes mellitus) evident on previous MPI but not evident on previous exercise stress test

6. To assess for CAD in a patient with unexplained or drug-induced intraventricular condition disturbances

7. Prior anatomic imaging study (coronary angiogram or CCTA) to assess recently demonstrated coronary stenosis of uncertain functional significance in a major coronary branch can have one stress test with imaging

8. Established CAD in a patient who had an acute coronary syndrome (ACS) (ST segment elevation MI (STEMI), Non–ST segment elevation MI (NSTEMI), unstable angina) event within the past 90 days provided that the patient has not undergone coronary angiography at the time of the acute event and is currently clinically stable

9. Evaluating new, recurrent, or worsening left ventricular dysfunction/CHF

10. 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

11. Pre-operative cardiac evaluation in patients undergoing non-cardiac surgery
    - Intermediate risk surgery (cardiac risk 1-5%) one or more cardiac risk factor(s) and inability to exercise adequately
    - high risk surgery (> 5% cardiac risk)

12. Asymptomatic patients with uninterpretable ECG and no evaluation for cardiac disease in the past 3 years

13. Planned cardiac or other solid-organ transplant if no cardiac evaluation has been performed within the past year

14. Patients to be treated with interleukin 2 (a pro-atherogenic agent) for various malignant disorders, etc.

15. Patients with disease conditions associated with CAD (e.g., DM, AAA, PVD, carotid artery disease, CRF) and no documented evaluation was performed within the preceding 2 years

16. Stress echocardiography will be considered reasonable and necessary for the evaluation of valvular heart disease and detection and management of occult pulmonary hypertension.

The following are considered medically necessary for cardiac PET:

1. For the evaluation of coronary artery disease for perfusion of the heart via myocardial perfusion imaging, PET scans using either FDA-approved radiopharmaceutical Rubidium 82 (RB-82) or Ammonia N-13 when performed at rest or with pharmacological stress used for noninvasive imaging of the perfusion of the heart for the diagnosis and management of patients with known or suspected coronary artery disease, provided the following requirements are met:

a. *The PET scan, whether at rest alone or rest with stress, is performed in place of, but not in addition to, a single photon emission computed tomography (SPECT);*

OR

b. *The PET scan, whether at rest alone or rest with stress, is used following a SPECT that was found to be inconclusive. In these cases, the PET scan must have been considered necessary in order to determine what medical or surgical intervention is required to treat the patient. (For purposes of this requirement, an inconclusive test is a test(s) whose results are equivocal, technically uninterpretable, or discordant with a patient's other clinical data and must be documented in the beneficiary's file.)*

For cardiac perfusion studies, patient selection criteria for PET scans involve an individual assessment of the pretest probability of CAD, based both on patient symptoms and risk factors:

- Patients at low risk for CAD may be adequately evaluated with exercise electrocardiography.
- Patients at high risk for CAD will typically not benefit from non-invasive assessment of myocardial perfusion since a negative test will not alter disease probability sufficiently to avoid invasive angiography.
- Myocardial perfusion imaging is potentially beneficial for patients at intermediate risk of CAD (approximately 25% to 75% disease prevalence).

The risk can be estimated using the patient's age, sex, and chest pain quality. The range for intermediate risk can vary.

The following summarizes a characterization for patient populations at intermediate risk for CAD:

Typical Angina:
Chest pain with all of the following characteristics:

- Substernal chest discomfort with characteristic quality and duration, and provoked by exertion or emotional stress, and relieved by rest or nitroglycerin
- Men ages 30-39
- Women ages 30-60

Atypical Angina:

- Chest pain that lacks one of the characteristics of typical angina
- Men ages 30-70
- Women ages 50 years and older

Non-anginal Chest Pain:

- Chest pain that meets one or none of the typical angina characteristics
- Men ages 50 years and older
- Women ages 60 years and older

2. *For the determination of myocardial viability as a primary or initial diagnostic study prior to revascularization, or following an inconclusive SPECT. However, if a patient receives an FDG PET study with inconclusive results, a follow up SPECT test is not covered. The identification of patients with partial loss of heart muscle movement or hibernating myocardium is important in selecting candidates with compromised ventricular function to determine appropriateness for revascularization. Diagnostic tests such as FDG PET distinguish between dysfunctional but viable myocardial tissue and scar tissue in order to affect management decisions in patients with ischemic cardiomyopathy and left ventricular dysfunction.*

3. For the determination of cardiac involvement, using Fluorodeoxyglucose (F-18 FDG), to diagnose cardiac sarcoidosis in patients who are unable to undergo magnetic resonance

imaging (MRI) scanning. Examples of patients who are unable to undergo MRI include, but are not limited to, patients with pacemakers, automatic implantable cardioverter defibrillators (AICDs), or other metal implants.

Limitations:

- The CMS Manual System, Pub. 100-8, Program Integrity Manual, Chapter 13, Section 5.1, outlines that "reasonable and necessary" services are "ordered and/or furnished by qualified personnel." Services will be considered medically reasonable and necessary only if performed by appropriately trained providers. A qualified physician for this service/procedure is defined as follows: A) Physician is properly enrolled in Medicare. B) Training and expertise must have been acquired within the framework of an accredited residency and/or fellowship program in the applicable specialty/subspecialty in the United States or must reflect equivalent education, training, and expertise endorsed by an academic institution in the United States and/or by the applicable specialty/subspecialty society in the United States.

- The presence of risk factors for CAD, absent disease activity, is not a Medicare-covered indication for noninvasive testing. Screening for coronary artery disease in asymptomatic patients is not considered reasonable and necessary.

- Patient selection should be based on clinical grounds. Pretest probability is based on age, gender, symptoms, and cardiac risk factors. Selection of the test should be made within the context of other testing modalities so that the expected information does not become redundant. In the instance where regional wall motion abnormalities and ejection fraction have been assessed, during the same episode of care, by other testing modalities (i.e. echocardiography), the medical necessity of repeating this assessment through the use of nuclear imaging modalities must be clearly documented in the medical record. The routine and repetitive monitoring of such patients beyond the first stress echo or MPI, in the absence of a documented clinical exacerbation (i.e., new symptoms or progression of existing symptoms) is not considered medically necessary.

- MPI SPECT/PET and stress echo are not covered in patients with low pretest probability, interpretable ECG, and the ability to exercise.

- MPI SPECT/PET and stress echo pre-operative evaluation for low risk non-cardiac surgery is not covered.

- MPI SPECT/PET and stress echo are not covered for the pre-operative evaluation of planned intermediate risk, non-cardiac surgery, and the patient is able to exercise.

- MPI SPECT/PET and stress echo are not covered for routine risk assessment for asymptomatic patients with known CAD, who have not had a revascularization procedure.

- MPI SPECT/PET and stress echo are not covered for pre-operative, asymptomatic patients undergoing high risk non-cardiac surgery up to 1 year following normal stress

echo, MPI SPECT, cardiac PET, coronary computed tomography angiography (CCTA), cardiac catheterization.

- Exercise stress testing would not be expected to be performed with signs and symptoms of cardiopulmonary instability and generally-recognized contraindications (e.g., unstable angina, LV dysfunction).

- For patients with an abnormal resting ECG because of left bundle branch block, pre-excitation syndrome, left ventricular hypertrophy (LVH) or digoxin therapy, an exercise or pharmacological imaging study should be considered because the accuracy of the exercise ECG in detecting provocable ischemia is reduced.

- Cardiovascular stress testing may be performed in conjunction with additional cardiac diagnostic tests including echocardiography and nuclear cardiac imaging. It is expected that only the most appropriate test(s) necessary will be performed and billed to Medicare. The routine and repetitive monitoring of such patients beyond the first cardiac stress test, in the absence of a documented change in condition (i.e. new symptoms or progression of existing symptoms) is not considered medically necessary.

- Exercise testing should be supervised by an appropriately trained physician. Exercise testing in selected patients can be performed safely by properly trained nurses, exercise physiologists, physician assistants, physical therapists, or medical technicians working directly under the supervision of a physician, who should be in the immediate vicinity and available for emergencies.

- Given the limitations of uptake, low photon energy and distribution, the perfusion imaging codes are not generally covered on the same date of service.

- Patients with initial abnormal test results have variable pre-test probabilities for adverse events, and the need and timing of follow up nuclear imaging studies must be justified in the medical record.

- All cardiovascular nuclear tests must be referred by a physician or a qualified non-physician.

- All cardiovascular nuclear tests must be performed under the general supervision of a physician. The Medicare Carriers Manual describes general supervision as applicable when a procedure is furnished under the physician's overall direction and control, but the physician's presence is not required during the performance of the procedure. Under general supervision guidelines, the training of the nonphysician personnel who actually perform the exercise procedure and the maintenance of the necessary equipment and supplies are the continuing responsibility of the supervising physician.

- Neither exercise testing nor radiologic imaging is indicated in the initial months after PCI without specific symptoms (i.e., chest pain, ECG changes etc.).

- Cardiovascular stress testing (with or without imaging) and cardiac imaging studies are not indicated if the results will not affect patient management decisions. If a decision to perform cardiac catheterization or other angiography has already been made, there is often no need for cardiovascular stress testing and/or cardiac imaging testing.

- *In the case of myocardial viability, the FDG positron emission tomography (PET) may be used following a SPECT that was found to be inconclusive. However, SPECT may not be used following an inconclusive FDG PET performed to evaluate myocardial viability*

CPT/HCPCS Codes

Group 2 Paragraph: N/A
Group 2 Codes:

STRESS ECHOCARDIOGRAPHY:

93350	ECHOCARDIOGRAPHY, TRANSTHORACIC, REAL-TIME WITH IMAGE DOCUMENTATION (2D), INCLUDES M-MODE RECORDING, WHEN PERFORMED, DURING REST AND CARDIOVASCULAR STRESS TEST USING TREADMILL, BICYCLE EXERCISE AND/OR PHARMACOLOGICALLY INDUCED STRESS, WITH INTERPRETATION AND REPORT;
93351	ECHOCARDIOGRAPHY, TRANSTHORACIC, REAL-TIME WITH IMAGE DOCUMENTATION (2D), INCLUDES M-MODE RECORDING, WHEN PERFORMED, DURING REST AND CARDIOVASCULAR STRESS TEST USING TREADMILL, BICYCLE EXERCISE AND/OR PHARMACOLOGICALLY INDUCED STRESS, WITH INTERPRETATION AND REPORT; INCLUDING PERFORMANCE OF CONTINUOUS ELECTROCARDIOGRAPHIC MONITORING, WITH SUPERVISION BY A PHYSICIAN OR OTHER QUALIFIED HEALTH CARE PROFESSIONAL
93352	USE OF ECHOCARDIOGRAPHIC CONTRAST AGENT DURING STRESS ECHOCARDIOGRAPHY (LIST SEPARATELY IN ADDITION TO CODE FOR PRIMARY PROCEDURE)

Group 3 Paragraph: N/A
Group 3 Codes:

MYOCARDIAL PERFUSION IMAGING

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

Group 4 Paragraph: The following ICD-9 codes are applicable to Procedure codes 78459, 78491, and 78492 only:
Group 4 Codes:

HEART (CARDIAC) PET

78459	MYOCARDIAL IMAGING, POSITRON EMISSION TOMOGRAPHY (PET), METABOLIC EVALUATION
78491	MYOCARDIAL IMAGING, POSITRON EMISSION TOMOGRAPHY (PET), PERFUSION; SINGLE STUDY AT REST OR STRESS
78492	MYOCARDIAL IMAGING, POSITRON EMISSION TOMOGRAPHY (PET), PERFUSION; MULTIPLE STUDIES AT REST AND/OR STRESS
A9526	NITROGEN N-13 AMMONIA, DIAGNOSTIC, PER STUDY DOSE, UP TO 40 MILLICURIES
A9552	FLUORODEOXYGLUCOSE F-18 FDG, DIAGNOSTIC, PER STUDY DOSE, UP TO 45 MILLICURIES
A9555	RUBIDIUM RB-82, DIAGNOSTIC, PER STUDY DOSE, UP TO 60 MILLICURIES

Please refer to the CMS website for the ICD-10 Codes that Support Medical Necessity .

Documentation Requirements

Medical record documentation maintained by the ordering/referring physician must indicate the medical necessity for performing the study, including:

- history and physical
- office/progress note, and
- test results

If the provider of the service is other than the ordering/referring physician, the provider of the service must maintain hard copy documentation of test results and interpretation, along with copies of the ordering/referring physician's order for the studies. The physician must state the clinical indication/medical necessity for the study in the order for the test. All segments of the service must have a formal interpretation and report.

When billing for the purchase of radiopharmaceutical(s), the dosage administered, unit price per dose, name and total charge of the radioactive drug must be on file.

The rationale for selecting pharmacologic stress rather than exercise stress must be indicated in the medical record.

The medical record must document when significant resting ECG abnormalities are present or a medication is being used and cannot be withdrawn that would interfere with the interpretation of a stress ECG, resulting in the selection of a myocardial perfusion study.

Documentation that the required conditions (as indicated in the "Indications and Limitations of Coverage and/or Medical Necessity" section of this policy) for the PET scan performed has been met must be maintained by the referring physician in the beneficiary's medical record. PET scan facilities must keep patient record information on file for each Medicare patient for whom such a PET scan claim is made. The medical record must include standard information (e.g., age, sex, and height) along with any annotations regarding body size or type that indicates the need for a PET scan to determine the patient's condition. Documentation for PET scans for myocardial perfusion imaging or for myocardial viability that were performed following a SPECT should address the inconclusive nature of the SPECT by describing if the results were equivocal, technically uninterpretable, or discordant with the patient's other clinical data in the beneficiary's file. Documentation for the PET scan for the evaluation of coronary artery disease for myocardial perfusion that is performed in place of, but not in addition to, a SPECT must support that the beneficiary had a condition(s) that may cause attenuation problems with SPECT [e.g., obesity (BMI greater than or equal to 35), large breasts, breast implants, left mastectomy, chest wall deformity, pleural or pericardial effusion)]. Documentation containing medical necessity of procedures in addition to testing results such as images and reports must be maintained. Medical necessity for each service reported must be clearly demonstrated in the patient's medical record. When billing for the purchase of radiopharmaceutical(s), the dosage administered, unit price per dose, name and total charge of the radioactive drug must be documented in the file.

Utilization Guidelines

It is expected that these services would be performed as indicated by current medical literature and/or standards of practice. When services are performed in excess of established parameters they may be subject to review for medical necessity.

Reimbursement of cardiovascular stress testing (93015-93018) which exceeds the frequency or duration indicated by the accepted standards of medical practice are not covered unless there are special circumstances which justify additional cardiovascular stress testing. The routine and repetitive monitoring of such patients beyond the first cardiac stress test, in the absence of a documented change in condition (i.e. new symptoms or progression of

existing symptoms) is not considered medically necessary.

Frequency is considered excessive when services are performed more often than generally accepted by peers, and the reason for additional services is not justified in the documentation. Each patient's condition and response to treatment must medically warrant the number of services reported for payment. There must be medical necessity for each service reported to be clearly demonstrated in the patient's medical record. Repetitive frequent PET for myocardial perfusion imaging or myocardial viability at a frequency greater than one per year is not reasonable and necessary in the absence of a documented change in condition (i.e., new symptoms or progression of existing symptoms). It is expected that patients will not routinely require the maximum allowable number of services.

Reviewed/Approved by Michael Pentecost MD Michael Pentecost, MD, Chief Medical Officer