“FOR CMS (MEDICARE) MEMBERS ONLY”

Coverage Indications, Limitations, and/or Medical Necessity

Cardiovascular nuclear imaging employs non-invasive techniques to assess alterations in coronary artery flow, and ventricular function.

The specific imaging technique (perfusion versus ventricular function) and the reason for the imaging determine which radionuclide agent is employed. A myocardial perfusion study utilizes an imaging isotope agent that reflects segmental and global myocardial blood flow and uptake, the interpretation of which is used to make inference about the presence of scar and ischemia.

Ventricular function studies utilize specific imaging isotopes to outline the borders of the ventricular endocardium, or to identify the ventricular blood pool independent of the surrounding myocardium. The motion of the left ventricle, synchronized with the electrocardiogram, is used to generate wall motion and ejection fraction information.

These tests may be performed at rest and during exercise, or with pharmacologic intervention when exercise cannot be performed. The acquisition of the images may be planar (single plane) or by multiple planes with computer integration, SPECT (single-photon emission computer tomography).

Indications:

Cardiovascular nuclear imaging is indicated for the following:

- Assessment of the functional and prognostic importance of angina;
- Diagnostic evaluation of patients with chest pain and uninterpretable or equivocal ECG changes caused by drugs, bundle branch block, or left ventricular hypertrophy;
- Assessment of congenital anomalies of coronary arteries;
- Risk assessment or re-evaluation of disease in patients who are asymptomatic or have stable symptoms, with known atherosclerotic heart disease on catheterization or SPECT
perfusion imaging, who have not had a revascularization procedure within the past two years:

- Detection of coronary artery disease in patients, without chest pain syndrome, with new-onset of diagnosed heart failure or left ventricular systolic dysfunction;
- Evaluation of ischemic versus non-ischemic cardiomyopathy when cardiac catheterization / coronary angiography are not planned;
- Evaluation of myocardial perfusion and/or function before and after coronary artery bypass surgery or other re-perfusion procedures;
- Quantification and surveillance of myocardial infarction and prognostication in patients with infarction;
- Assessment of congenital anomalies of coronary arteries;
- Preoperative assessment for non-cardiac surgery, when used to determine risk for surgery and/or perioperative management in:
  - patients with minor or intermediate clinical risk predictors and poor functional capacity;
  - patients with intermediate or high likelihood of coronary heart disease, or patients with poor functional capacity undergoing high risk non-cardiac surgery;

The "ACA/AHA 2007 Guidelines on Perioperative Cardiovascular Evaluation and Care for Non-Cardiac Surgery" (JACC 2007; 50:e159-e242) provides this information:

High risk surgery: aortic and peripheral vascular surgery
Low risk surgery: endoscopic procedures, superficial surgery, cataract surgery, breast surgery, ambulatory surgery

Poor functional capacity = less than 4 METS

Clinical risk factors:

1) history of ischemic heart disease  
2) history of compensated or prior heart failure  
3) history of cerebrovascular disease  
4) diabetes mellitus  
5) renal insufficiency

- Decision-making for testing is based upon the presence of multiple clinical risk factors, the level of functional capacity, the risk of the surgery and the likelihood that the results of the cardiac testing would change the management.

- Evaluation of ventricular function in patients with non-ischemic myocardial disease;
- Evaluation of patients in whom an accurate measure of the ejection fraction is needed to make a determination of whether to implant a defibrillator or biventricular pacemaker;
- Evaluation of a patient receiving chemotherapeutic drugs which are potentially cardiotoxic (e.g., adriamycin).
• First pass studies will be considered medically necessary only when information sought is immediately relevant to the management of the patient’s clinical condition, and has not been previously obtained or likely to be obtained from other planned tests such as echocardiography or equilibrium gated blood pool studies. First pass studies may be indicated for the assessment and identification of shunts.

• Infarct avid scintigraphy is indicated in patients in whom it is not possible to make a definitive diagnosis of myocardial infarction by EKG or enzyme testing.

Patient selection should be based on clinical grounds:

Patients with a high pretest probability of disease are not usually candidates for a study for diagnostic purposes, though the size and reversibility of a defect and its functional consequences may be required for clinical decision-making.

Patients with a moderate probability of disease benefit the most from the study when the diagnosis is in question.

Selection of tests should be made within the context of other tests, scheduled and previously performed, so that the anticipated information obtained is unique and not redundant.

Limitations:

Special Equipment Requirements:

Given the limitations of uptake, low photon energy and redistribution, the cardiac blood pool codes and perfusion imaging codes are not generally covered on the same date of service. However, in light of the predictive value of exercise-induced changes in ejection fraction, an exception will be made to allow first pass, single study with exercise along with the appropriate perfusion studies. Providers who bill this service must certify within their records that their laboratories are specially equipped to process such studies.

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

All stress tests must be performed under the direct supervision of a physician. The nuclear test components must be performed under the general supervision of a physician.

Myocardial perfusion studies performed based on the presence of risk factors in the absence of cardiac symptoms, cardiac abnormalities on physical examination, or abnormalities on cardiac testing (e.g., electrocardiographic tests, echocardiography, etc) will be considered screening and denied as not covered by Medicare.

Tests that are anticipated to provide information duplicative of another test already performed will be denied as not medically necessary.

Tests performed when the results would not be anticipated to influence medical management decisions will be denied as not medically necessary.
Myocardial perfusion studies performed subsequent to a diagnostic myocardial PET scan will denied as not medically necessary.

Infarct avid scintigraphy will be denied if the diagnosis of myocardial infarction has already been confirmed by enzymes and/or EKG.

Tests performed unrelated to changes in a patient's signs or symptoms, or for immediate pre-operative evaluation will be denied as medically unnecessary.

Tests performed for risk assessment prior to high risk non-cardiac surgery in asymptomatic patients within one year following normal catheterization or non-invasive test will be considered medically unnecessary and denied.

Tests performed for preoperative evaluation in patients undergoing low-risk surgery will be denied.

**Bill Type Codes:**
Contractors may specify Bill Types to help providers identify those Bill Types typically used to report this service. Absence of a Bill Type does not guarantee that the policy does not apply to that Bill Type. Complete absence of all Bill Types indicates that coverage is not influenced by Bill Type and the policy should be assumed to apply equally to all claims.

- 012x Hospital Inpatient (Medicare Part B only)
- 013x Hospital Outpatient
- 021x Skilled Nursing - Inpatient (Including Medicare Part A)
- 085x Critical Access Hospital

**Revenue Codes:**
Contractors may specify Revenue Codes to help providers identify those Revenue Codes typically used to report this service. In most instances Revenue Codes are purely advisory; unless specified in the policy services reported under other Revenue Codes are equally subject to this coverage determination. Complete absence of all Revenue Codes indicates that coverage is not influenced by Revenue Code and the policy should be assumed to apply equally to all Revenue Codes.

Revenue codes only apply to providers who bill these services to the Part A MAC. Revenue codes do not apply to physicians, other professionals and suppliers who bill these services to the Part B MAC.

Please note that not all revenue codes apply to every type of bill code. Providers are encouraged to refer to the FISS revenue code file for allowable bill types. Similarly, not all revenue codes apply to each CPT/HCPCS code. Providers are encouraged to refer to the FISS HCPCS file for allowable revenue codes.

- 034X Nuclear Medicine - General Classification
HCPCS code J0151 is deleted effective 01/01/2015

Group 1 Codes:

- **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
MYOCARDIAL IMAGING, INFARCT AVID, PLANAR: QUALITATIVE OR QUANTITATIVE

78466

MYOCARDIAL IMAGING, INFARCT AVID, PLANAR: WITH EJECTION FRACTION BY FIRST PASS TECHNIQUE

78468

MYOCARDIAL IMAGING, INFARCT AVID, PLANAR: TOMOGRAPHIC SPECT WITH OR WITHOUT QUANTIFICATION

78469

CARDIAC BLOOD POOL IMAGING, GATED EQUILIBRIUM: PLANAR, SINGLE STUDY AT REST OR STRESS (EXERCISE AND/OR PHARMACOLOGIC), WALL MOTION STUDY PLUS EJECTION FRACTION, WITH OR WITHOUT ADDITIONAL QUANTITATIVE PROCESSING

78472

CARDIAC BLOOD POOL IMAGING, GATED EQUILIBRIUM: MULTIPLE STUDIES, WALL MOTION STUDY PLUS EJECTION FRACTION, AT REST AND STRESS (EXERCISE AND/OR PHARMACOLOGIC), WITH OR WITHOUT ADDITIONAL QUANTIFICATION

78473

CARDIAC BLOOD POOL IMAGING (PLANAR), FIRST PASS TECHNIQUE: SINGLE STUDY, AT REST OR WITH STRESS (EXERCISE AND/OR PHARMACOLOGIC), WALL MOTION STUDY PLUS EJECTION FRACTION, WITH OR WITHOUT QUANTIFICATION

78481

CARDIAC BLOOD POOL IMAGING (PLANAR), FIRST PASS TECHNIQUE: MULTIPLE STUDIES, AT REST AND WITH STRESS (EXERCISE AND/OR PHARMACOLOGIC), WALL MOTION STUDY PLUS EJECTION FRACTION, WITH OR WITHOUT QUANTIFICATION

78483

CARDIAC BLOOD POOL IMAGING, GATED EQUILIBRIUM, SPECT, AT REST, WALL MOTION STUDY PLUS EJECTION FRACTION, WITH OR WITHOUT QUANTITATIVE PROCESSING

78494

CARDIAC BLOOD POOL IMAGING, GATED EQUILIBRIUM, SINGLE STUDY, AT REST, WITH RIGHT VENTRICULAR EJECTION FRACTION BY FIRST PASS TECHNIQUE (LIST SEPARATELY IN ADDITION TO CODE FOR PRIMARY PROCEDURE)

78496

CARDIOVASCULAR STRESS TEST USING MAXIMAL OR
SUBMAXIMAL TREADMILL OR BICYCLE EXERCISE, CONTINUOUS ELECTROCARDIOGRAPHIC MONITORING, AND/OR PHARMACOLOGICAL STRESS; WITH SUPERVISION, INTERPRETATION AND REPORT
CARDIOVASCULAR STRESS TEST USING MAXIMAL OR SUBMAXIMAL TREADMILL OR BICYCLE EXERCISE, CONTINUOUS ELECTROCARDIOGRAPHIC MONITORING, AND/OR PHARMACOLOGICAL STRESS; SUPERVISION ONLY, WITHOUT INTERPRETATION AND REPORT
CARDIOVASCULAR STRESS TEST USING MAXIMAL OR SUBMAXIMAL TREADMILL OR BICYCLE EXERCISE, CONTINUOUS ELECTROCARDIOGRAPHIC MONITORING, AND/OR PHARMACOLOGICAL STRESS: TRACING ONLY, WITHOUT INTERPRETATION AND REPORT
CARDIOVASCULAR STRESS TEST USING MAXIMAL OR SUBMAXIMAL TREADMILL OR BICYCLE EXERCISE, CONTINUOUS ELECTROCARDIOGRAPHIC MONITORING, AND/OR PHARMACOLOGICAL STRESS: INTERPRETATION AND REPORT ONLY

A9500  TECHNETIUM TC-99M SESTAMIBI, DIAGNOSTIC, PER STUDY DOSE
A9501  TECHNETIUM TC-99M TEBOROXIME, DIAGNOSTIC, PER STUDY DOSE
A9502  TECHNETIUM TC-99M TETROFOSMIN, DIAGNOSTIC, PER STUDY DOSE
A9505  THALLIUM TL-201 THALLOUS CHLORIDE, DIAGNOSTIC, PER MILLCURIE
A9512  TECHNETIUM TC-99M PERTECHNETATE, DIAGNOSTIC, PER MILLCURIE
A9520  TECHNETIUM TC-99M, TILMANOCEPT, DIAGNOSTIC, UP TO 0.5 MILLCURIERS
A9538  TECHNETIUM TC-99M PYROPHOSPHATE, DIAGNOSTIC, PER STUDY DOSE, UP TO 25 MILLCURIERS
A9560  TECHNETIUM TC-99M LABELED RED BLOOD CELLS, DIAGNOSTIC, PER STUDY DOSE, UP TO 30 MILLCURIERS
Please refer to the CMS website for ICD-10 Codes that Support Medical Necessity

Documentation Requirements:
The patient's medical record must contain documentation that fully supports the medical necessity for services included within this LCD. (See "Indications and Limitations of Coverage.") This documentation includes, but is not limited to, relevant medical history, physical examination, and results of pertinent diagnostic tests or procedures.

Medical records must substantiate the medical necessity of the services, including a clinical diagnosis and the specific reason for the study.

All segments of the service must have a formal interpretation and report.

The referral order must include the medical indication for the study, and be kept on file in the patient's medical record.

When CPT code 78472 and add-on code 78496 are submitted with perfusion codes 78451-78454, the formal reports must document that simultaneous cardiac function studies using the first pass technique were performed and that the laboratories are equipped to perform such studies.

When a blood pool scan is performed to assess ejection fraction prior to implantation of defibrillator or biventricular pacemaker, the record must document the intended plan for insertion and the result of the test.

When billing for the purchase of radiopharmaceutical(s), a copy of the bill indicating the dosage administered, unit price per dose, name and total charge of the radiopharmaceutical must be on file in the patient's medical record and available on request.

Utilization Guidelines:
Risk assessment or re-evaluation of disease in patients who are asymptomatic or have stable symptoms, with known atherosclerotic heart disease on catheterization or SPECT perfusion imaging, who have not had a revascularization procedure within the past two
years would be reimbursable; otherwise tests repeated in the absence of changes in cardiac signs or symptoms will be considered not medically necessary.

Adenosine may be reported with an NOS no greater than that required to bill an amount administered at 140 mcg/kg/min for 6 minutes. Higher dosages of this biological will be considered medically unnecessary.

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