Evolent Clinical Guideline ~~0277~~7311 for Multiple Gated Acquisition Scan (MUGA)

Guideline ~~or Policy~~ Number:	Applicable Codes	
Evolent_CG_~~027~~7311		
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Original Date:	**Last Revised Date:**	**Implementation Date:**
January 2026	July 2025	January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose (1–3) ~~,4)~~

Multiple-gated acquisition (MUGA) scanning uses radiolabeled red blood cells to scan right and left ventricular images in a cine loop format that is synchronized with the electrocardiogram.

A prior MUGA scan is not an indication for repeat MUGA (if another modality would be suitable, i.e., ~~TTE).~~transthoracic echocardiography (TTE)).

Special Note

See ~~**Legislative Requirements**~~legislative language for specific mandates in ~~Washington~~**Washington** State

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ~~(5,6,7,~~(4–8)~~,9)~~

INDICATIONS FOR MULTIPLE GATED ACQUISITION (MUGA) SCAN ~~(10)~~(9)

- To evaluate left ventricular function in a patient with coronary artery disease, valvular heart disease, myocardial disease, or congenital heart disease, in any of the following scenarios:
  - When ventricular function is required for management, and ~~transthoracic echocardiography (~~TTE~~)~~ or other imaging has proven inadequate [1,10]~~11)~~
  - Radionuclide ventriculography is being performed for assessment of right ventricular (RV) function with no prior MUGA done within the last 3 months
- In the course of treatment with cardiotoxic medication when TTE images are inadequate to evaluate left ventricular systolic function ~~.~~[1,10–13]~~.~~~~14)~~
  - Baseline assessment prior to initiation of therapy
  - Monitoring during therapy. The frequency of testing should be left to the discretion of the ordering provider but in the absence of new abnormal findings, generally no more often than every 6 weeks while on active therapy
  - Long term surveillance after completion of therapy may be required, especially for those who have been exposed to anthracycline medication. The frequency of testing is generally every 6-12 months, or at the discretion of the provider

LEGISLATIVE ~~REQUIREMENTS~~LANGUAGE

~~State of~~ Washington ~~(15)~~

~~*Health Technology Clinical Committee 20211105A*~~

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease *(14)*

Number and Coverage Topic:

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease

HTCC coverage determination:

Noninvasive cardiac imaging is a **covered benefit with conditions**.

HTCC reimbursement determination:

Limitations of coverage: The following noninvasive cardiac imaging technologies are **covered with conditions**:

- Stress echocardiography for:
  - Symptomatic adult patients (≥18 years of age) at intermediate or high risk of Coronary Artery Disease (CAD), or
  - Adult patients with known CAD who have new or worsening symptoms.

- Single Positron Emission Tomography (SPECT) for:
  - Patients under the same conditions as stress echocardiography when stress echocardiography is not technically feasible or clinically appropriate.
- Positron Emission Tomography (PET) for:
  - Patients under the same conditions as SPECT, when SPECT is not technically feasible or clinically appropriate.
- Coronary Computed Tomographic Angiography (CCTA) for:
  - Symptomatic adult patients (≥18 years of age) at intermediate or high risk of CAD, or
  - Adult patients with known CAD who have new or worsening symptoms.
- CCTA with Fractional Flow Reserve (FFR) for:
  - Patients under the same conditions as CCTA, when further investigation of functional significance of stenoses is clinically indicated.

Non-covered indicators:

N/A

~~**Notes:**~~

- ~~Out of scope/data not reviewed for this decision:~~
  - ~~Asymptomatic individuals, follow up of prior abnormal cardiac imaging studies, myocardial viability, preoperative evaluation~~
  - ~~Patients presenting for evaluation of cardiac pathologies other than CAD~~
- ~~This determination supersedes the following previous determinations:~~
  - ~~Coronary Computed Tomographic Angiography for detection of Coronary Artery Disease (20081114A)~~
  - ~~Cardiac Nuclear Imaging (20130920A)~~

CODING AND STANDARDS

~~Coding~~

~~CPT~~ Codes

78472, 78473, 78494, +78496, A9512, A9560

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial

☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

The two types of radionuclide studies commonly used for cardiac evaluation are myocardial perfusion imaging and ventriculography. Myocardial perfusion imaging is used primarily for the evaluation of coronary artery disease. Ventriculography is sometimes referred to as multiple gated acquisition scanning (MUGA) and is primarily used to evaluate valvular disease and cardiomyopathies. Either type of study may be obtained at rest or stress.

Radionuclide Ventriculography is a medical imaging test used to determine a patient's cardiac function in the right, or more typically, left ventricle. Cardiac ventriculography involves injecting a radioisotope into the heart's ventricle(s) through a peripheral vein to measure the volume of blood pumped. Both regional and global left ventricular function (ejection fraction) as well as left ventricular size is measured.

AUC Score

A reasonable diagnostic or therapeutic procedure care can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost effective manner. ~~(8)~~(5)

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Acronyms / Abbreviations

EF: Ejection fraction

MUGA: Multiple gated acquisition (nuclear scan of ventricular function)

TTE: Transthoracic echocardiography

SUMMARY OF EVIDENCE

2013 ACCF/ACR/ASE/ASNC/SCCT/SCMR Appropriate Utilization of Cardiovascular Imaging in Heart Failure (1)

Study Design: The study is a joint report by the American College of Radiology Appropriateness Criteria Committee and the American College of Cardiology Foundation Appropriate Use Criteria Task Force. It involves a multidisciplinary rating panel comprising

imagers, cardiovascular clinicians, general practitioners, and outcomes experts. The panel assessed the appropriateness of imaging procedures for various clinical indications in heart failure patients using a modified Delphi exercise.

Target Population: The target population includes patients with heart failure, which is a rapidly growing epidemic affecting approximately 5.8 million patients in the United States. The study focuses on patients with suspected, incompletely characterized, or known heart failure, including those with ischemic and nonischemic etiologies.

Key Factors

- **Prevalence and Clinical Significance**: Heart failure is a significant cause of morbidity and mortality, with a 5-year mortality rate of approximately 50% after diagnosis.
- **Economic Impact**: Annual medical expenditures related to heart failure in the United States exceed $39.2 billion.
- **Imaging Modalities**: The study evaluates various imaging modalities, including echocardiography, cardiovascular magnetic resonance (CMR), single-photon emission computed tomography (SPECT), positron emission tomography (PET), cardiovascular computed tomography (CCT), and conventional diagnostic cardiac catheterization.
- **Clinical Scenarios**: The study identifies key clinical scenarios for imaging use, such as newly suspected heart failure, evaluation for ischemic etiology, viability evaluation, consideration and follow-up for implantable cardioverter-defibrillator (ICD) or cardiac resynchronization therapy (CRT), and repeat evaluation of heart failure.
- **Appropriateness Criteria**: The study provides detailed criteria for the appropriateness of imaging procedures based on clinical indications, emphasizing the importance of balancing risk and benefit in the context of available resources.

ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 Appropriate Use Criteria for Cardiac Radionuclide Imaging [2]

Study Design: The study conducted by the American College of Cardiology Foundation (ACCF) and several other specialty societies aimed to revise the original Single-Photon Emission Computed Tomography Myocardial Perfusion Imaging (SPECT MPI) Appropriateness Criteria published four years earlier. The revision was necessary to reflect changes in test utilization, new clinical data, and to clarify RNI use where omissions or lack of clarity existed in the original criteria. The study involved developing 67 clinical scenarios by a writing group and scoring them by a separate technical panel on a scale of 1 to 9 to designate appropriate use, inappropriate use, or uncertain use.

Target Population: The target population for this study included patients with various cardiovascular conditions where cardiac RNI is frequently considered. This included patients with coronary artery disease (CAD), acute coronary syndrome (ACS), heart failure, atrial fibrillation, ventricular tachycardia, syncope, elevated troponin levels, and those undergoing preoperative evaluation for noncardiac surgery.

Key Factors

- **Appropriate Use Criteria (AUC)**: The study aimed to provide guidance on the appropriate use of cardiac RNI for diverse clinical scenarios. The criteria were expected

to be useful for clinicians, healthcare facilities, and third-party payers engaged in the delivery of cardiovascular imaging.

- **Clinical Scenarios**: The study developed 67 clinical scenarios that were scored by the technical panel. The scenarios included detection of CAD, risk assessment without ischemic equivalent, risk assessment with prior test results and/or known chronic stable CAD, risk assessment within 3 months of an ACS, postrevascularization, assessment of viability/ischemia, and evaluation of ventricular function.
- **Scoring System**: The technical panel scored each indication on a scale of 1 to 9, with scores 7-9 indicating appropriate use, 4-6 indicating uncertain use, and 1-3 indicating inappropriate use.
- **Impact on Clinical Decision Making**: The results of the study were anticipated to have a significant impact on physician decision making, test performance, and reimbursement policy, and to help guide future research.

ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2019 Appropriate Use Criteria for Multimodality Imaging in the Assessment of Cardiac Structure and Function in Nonvalvular Heart Disease [9]

Study Design: The study is a report developed by the American College of Cardiology Appropriate Use Criteria Task Force, along with several other cardiovascular societies. It aims to provide appropriate use criteria (AUC) for multimodality imaging in nonvalvular heart disease. The clinical scenarios (indications) were developed by a diverse writing group and scored by an independent rating panel using standardized methodology.

Target Population: The target population includes patients with nonvalvular heart disease, encompassing various conditions such as heart failure, diseases of the aorta and pericardium, and any disorder involving abnormal cardiac structure or function excluding valvular diseases.

Key Factors:

- **Clinical Scenarios**: The document covers 102 clinical scenarios representing patient presentations encountered in everyday practice. These scenarios were developed based on the most current American College of Cardiology/American Heart Association Clinical Practice Guidelines.
- **Imaging Modalities**: The study evaluates multiple imaging modalities, including transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), cardiovascular magnetic resonance imaging (CMR), computed tomography (CT), and others.
- **Appropriateness Ratings**: Each clinical scenario was rated on a scale of 1 to 9, with scores of 7 to 9 indicating that a modality is considered appropriate, scores of 4 to 6 indicating that a modality may be appropriate, and scores of 1 to 3 indicating that a modality is considered rarely appropriate.
- **Objective**: The primary objective is to provide a framework for the assessment of these scenarios by practices that will improve and standardize physician decision-making.

ANALYSIS OF EVIDENCE

Shared Conclusions (1,2,9)

1. **Appropriate Use Criteria (AUC)**: All three articles emphasize the importance of appropriate use criteria (AUC) in guiding clinical decision-making for cardiovascular imaging. They highlight the need for standardized methodologies to evaluate the appropriateness of various imaging modalities in different clinical scenarios.
2. **Multimodality Imaging**: The articles agree on the value of multimodality imaging in assessing cardiac structure and function. They discuss the use of echocardiography, cardiovascular magnetic resonance (CMR), single-photon emission computed tomography (SPECT), positron emission tomography (PET), and computed tomography (CT) in various clinical contexts.
3. **Clinical Guidelines**: Each article references clinical guidelines from the American College of Cardiology (ACC) and the American Heart Association (AHA) to support their recommendations. They emphasize the importance of adhering to these guidelines to ensure high-quality cardiovascular care.

POLICY HISTORY

~~*Summary*~~

Date	Summary
July 2025	● This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7311-01 for Multiple Gated Acquisition Scan and ECG 027 for Multiple Gated Acquisition Scan into Evolent Clinical Guideline 7311 for Multiple Gated Acquisition Scan (MUGA) ○ This guideline also merges Procedure Codes from these two Evolent guidelines ● Added new bullet-point to the General Statement section ● Added a Summary of Evidence and Analysis of Evidence

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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