Cohere Medical Policy – Multiple Gated Acquisition (MUGA) Scan

Clinical Policy for Medical Necessity Review

CHP-013-3.1 Version 3.1

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Specialty: Diagnostic Imaging
Population Type: Adult (18+ years old), Pediatric (0-17 years old)

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Procedure Codes (CPT/HCPCS)

Service: Multiple Gated Acquisition (MUGA) Scan	
Code	Description
78466	Myocardial imaging, infarct avid, planar; qualitative or quantitative
78468	Myocardial imaging, infarct avid, planar; with ejection fraction by first pass technique
78469	Myocardial imaging, infarct avid, planar; tomographic SPECT with or without quantification
78472	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
78473	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
78481	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
78483	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
78494	Cardiac blood pool imaging, gated equilibrium, SPECT, at rest, wall motion study plus ejection fraction, with or without quantitative processing
78496	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)

Important Notices

Notices & Disclaimers:

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Other Notices:

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Service: Multiple Gated Acquisition (MUGA) Scan - Description

A multiple gated acquisition (MUGA) scan is a noninvasive nuclear medicine test used to evaluate the heart's structural and dynamic properties. A MUGA scan uses a radioactive tracer to create a computerized image of the heart as it beats. This image is used to evaluate the heart's overall ability to pump blood by calculating a left and right ventricular ejection fraction and assessing regional wall motion abnormalities.[1-5] An equilibrium MUGA scan utilizes technetium-99m (Tc-99m) pertechnetate bound to red blood cells. The technetium remains in the blood pool, allowing serial imaging over several hours. A "first-pass" study utilizes rapidly acquired image frames to observe a bolus of technetium-99m or other suitable radionuclide as it moves through the venous system into the right atrium, right ventricle, pulmonary artery, lungs, left atrium, left ventricle, and aorta.[2] The procedure can give a separate evaluation of right ventricular function, as well as assess for an intracardiac shunt.[2,4]

Service: Multiple Gated Acquisition (MUGA) Scan - Medical Necessity Criteria

Administrative Guidelines for Medical Necessity Review

Cohere Health takes an evidence-based approach to reviewing imaging and procedure requests, meaning that sufficient clinical information must be provided at the time of submission to determine medical necessity. Documentation must include a recent and detailed history, physical examination related to the onset or change in symptoms, relevant lab results, prior imaging, and details of previous treatments. Advanced imaging or procedures should be requested after a clinical evaluation by the treating provider, which may include a referral to a specialist.

- When a specific clinical indication is not explicitly addressed in the Cohere Health medical policy, medical necessity will be determined based on established clinical best practices, as supported by evidence-based literature, peer-reviewed sources, professional society guidelines, and state or national recommendations, unless otherwise directed by the health plan.
- Requests submitted without clinical documentation or those that do not align with the provided clinical information—such as mismatched laterality, body part, or CPT code—may be denied due to a lack of medical necessity resulting from insufficient or inconsistent clinical information.
- Repeat diagnostic testing due to technical issues—such as patient motion, incomplete exams, or incorrect imaging sequences—may not be considered medically necessary, as it is the responsibility of the imaging center to deliver appropriate, high-quality studies as originally authorized. Similarly, repeat imaging requested at a different facility based solely on provider preference may not be approved for medical necessity.
- When multiple diagnostic or therapeutic procedures are requested simultaneously or within the past 3 months, each will be reviewed independently. Clinical documentation must clearly justify all of the following:
  - The medical necessity of each individual request.
  - Why prior imaging or procedures were inconclusive, or why additional/follow-up studies are needed.
  - How the results will impact patient management or treatment decisions.
- Duplicate exams or requests involving adjacent or contiguous body parts may be considered not medically necessary if the documentation demonstrates that the patient's primary symptoms can be adequately assessed and/or treated with a single study or procedure.
- Cohere Health evaluates imaging exams based on medical necessity, regardless of whether contrast is used. If an initial non-contrast study is completed and the radiologist later determines that contrast is needed to clarify a finding, the original authorization number may be used—provided the contrast-enhanced exam is performed at the same imaging center and within the original request's validity period, unless otherwise directed by the health plan.

Indications:

- A **multiple gated acquisition (MUGA) scan** is considered appropriate if **ANY** of the following is **TRUE**:
  - An equilibrium MUGA scan under **ALL** of the following:
    - Evaluating ventricular size, wall motion, stroke volume, and ejection fraction; **AND**
    - Information is necessary to direct further evaluation and management for **ALL** of the following:[1-4]
      - **ANY** of the following clinical scenarios:
        - When an assessment of ventricular function is required for management, and transthoracic echocardiography (TTE) or other imaging has proven inadequate[5]; **OR**
        - When there are conflicting results among other tests measuring ejection fraction (EF), and the results of the MUGA will help in the management of the patient; **AND**
      - For the evaluation of **ANY** of the following:
        - Accurate left ventricular ejection fraction (LVEF) in a patient with ongoing heart failure despite guideline-directed medical therapy; **OR**

        - Accurate measure of ejection fraction to determine whether to implant a defibrillator or biventricular pacemaker; **OR**
        - Monitoring and follow-up of a patient receiving any potentially cardiotoxic chemotherapy agent before or after chemotherapy[3]; **OR**
        - Ventricular dysfunction with post-transplant rejection[2]; **OR**
        - Ventricular function in a patient with myocardial disease[2]; **OR**
    - A first pass MUGA study and **ANY** of the following[2]:
        - Need for assessment or identification of intracardiac shunt[2]; **OR**
        - Information has not been previously obtained or is unlikely to be obtained from other planned tests (e.g., echocardiography, equilibrium gated blood pool studies); **OR**
        - Assessment of right ventricular ejection fraction (RVEF) when TTE or other imaging has proven inadequate[4]; **OR**
    - Repeat imaging and **ALL** of the following:
        - Repeat request follows recent imaging within the past 3 months of the same anatomic region with the same or similar modality; **AND**
        - No established guidelines for repeat imaging; **AND**
        - **ANY** of the following:
            - Need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
            - New or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
            - No change in symptoms and a well-established clinical need for ongoing monitoring that will influence management.

Non-Indications:

- A **MUGA scan** is not considered appropriate if **ANY** of the following is **TRUE**:
    - Known allergy or sensitivity to the materials used during the procedure; **OR**
    - Pregnant or breastfeeding patients; **OR**
    - The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or worsening symptoms.[5]

Disclaimer on Radiation Exposure in Pediatric Populations

Due to the heightened sensitivity of pediatric patients to ionizing radiation, minimizing exposure is paramount. At Cohere, we are dedicated to ensuring that every patient, including the pediatric population, has access to appropriate imaging following accepted guidelines. Radiation risk is dependent mainly on the patient's age at exposure, the organs exposed, and the patient's sex, though there are other variables. The following technical guidelines are provided to ensure safe and effective imaging practices:

Radiation Dose Optimization: Adhere to the lowest effective dose principle for pediatric imaging. Ensure that imaging protocols are specifically tailored for pediatric patients to limit radiation exposure.[6,7]

Alternative Modalities: Prioritize non-ionizing imaging options such as ultrasound or MRI when clinically feasible, as they are less likely to expose the patient to ionizing radiation. For instance, MRI or ultrasound should be considered if they are more likely to provide an accurate diagnosis than CT, fluoroscopy, or radiography.[6,7]

Cumulative Dose Monitoring: Implement systems to track cumulative radiation exposure in pediatric patients, particularly for those requiring multiple imaging studies. Regularly reassess the necessity of repeat imaging based on clinical evaluation.[6,7]

CT Imaging Considerations: When CT is deemed the best method for achieving a correct diagnosis, use the lowest possible radiation dose that still yields reliable diagnostic images.[6,7]

Cohere Imaging Gently Guideline: The purpose of this guideline is to act as a potential override when clinically indicated to adhere to Imaging Gently and Imaging Wisely guidelines and As Low As Reasonably Possible (ALARA) principles.

Medical Evidence

For decades, multiple gated acquisition (MUGA) scans have been used to detect ventricular dysfunction.[8] However, due to concerns surrounding serial radiation exposure, echocardiography has largely superseded MUGA scans to become the primary method of medical imaging used to monitor and manage chemotherapy-induced cardiomyopathy.[9] Patients living with breast cancer and patients receiving trastuzumab were found to be particularly vulnerable to radiation exposure and secondary cancer risk associated with repeated MUGA scans.[10] However, the imaging test is still used to monitor left ventricular ejection fraction (LVEF) in clinical settings due to its high reproducibility and ease of administration.[6]

Printezi et al. (2022) conducted a systematic review examining the relative concordance between MUGA, transthoracic echocardiogram (TTE), and cardiac magnetic resonance imaging (CMR) for the monitoring of LVEF in patients with cancer therapy-related cardiac dysfunction. Twenty-two studies were included in the review, reporting on a total of 1017 patients. Overall, TTE and MUGA showed greater concordance, while the agreement between CMR and MUGA was weaker. The authors concludes that a multimodal approach to diagnostic imaging may be possible when monitoring LVEF in patients receiving treatment for cancer.[4]

Mitra et al. (2012) examined two important uses of MUGA scans in day-to-day clinical practice: serial assessment of left ventricular ejection fraction (LVEF) in patients receiving cardiotoxic chemotherapy and in patients with intractable heart failure (HF) who require an accurate determination of LVEF. Among the benefits of the test, according to the authors, are its non-invasive nature, use of low doses of radiation, and ease of administration.[1]

References

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Policy Revision History/Information

Clinical Guideline Version	Date	Review History
Version 1	12/08/2023	Original Date.
Version 2	01/23/2025	- Annual Review. - In indications: Deleted Infarct avid scintigraphy indication. - In non-indications: The word "lactating" has been replaced by "breastfeeding" to include a patient who has had a stillbirth and is physiologically lactating but not feeding a baby with breast milk or a patient who is formula feeding baby and is physiologically lactating but not feeding a baby with breast milk. - Removed CMS references. - Added reference on chemotherapy-induced dysfunction (reference #4)
Version 3	01/29/2026	Annual Review. Minor edits made to Description and Indications. Added repeat imaging language to Indications section. Added studies to the Medical Evidence section. Added references (5,10).
Version 3.1	03/23/2026	Revision. Re-added the following codes: 78472, 78473.