Cohere Medicare Advantage Policy - Magnetic Resonance Imaging (MRI), Cardiac

Clinical Policy for Medical Necessity Review

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Important Notices

Notices & Disclaimers:

GUIDELINES ARE SOLELY FOR COHERE'S USE IN PERFORMING MEDICAL NECESSITY REVIEWS AND ARE NOT INTENDED TO INFORM OR ALTER CLINICAL DECISION-MAKING OF END USERS.

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Other Notices:

Policy Information:

Specialty Area: Diagnostic Imaging
Policy Name: Cohere Medicare Advantage Policy - Magnetic Resonance Imaging (MRI), Cardiac

Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

Table of Contents

Medical Necessity Criteria

Service: Magnetic Resonance Imaging (MRI), Cardiac

Related CMS Documents

Please refer to the CMS Medicare Coverage Database for the most current applicable CMS National Coverage.[1-5]

- National Coverage Determination (NCD) 220.2. Magnetic Resonance Imaging (MRI)
- Local Coverage Determination (LCD). Cardiology non-emergent outpatient stress testing (L35083)
  - Billing and Coding: Cardiology non-emergent outpatient stress testing (A56423)
- Local Coverage Determination (LCD). Cardiology non-emergent outpatient stress testing (L38396)
  - Billing and Coding: Cardiology non-emergent outpatient stress testing (A56952)

Description

Cardiac magnetic resonance imaging (MRI) offers exquisite anatomic detail of the heart and can also provide valuable functional information through various sequences. While not a first-line imaging modality, it proves highly useful when structural abnormalities (congenital or acquired) or functional deficiencies require further investigation of the heart and pericardial structures.

Medical Necessity Criteria

Indications

Cardiac magnetic resonance imaging (MRI) without stress testing is considered appropriate if **ALL** of the following are **TRUE**:

- First-line cardiac imaging modality, such as transthoracic echocardiogram (TTE), is inconclusive/non-diagnostic, and further imaging is indicated for diagnostic and therapeutic purposes[6]; **AND**
- **ANY** of the following[6]:
  - Documented or suspected neoplastic conditions of the heart (including cardiac masses or mass-like conditions such as cardiac or para-cardiac mass); **OR**
  - Infection or an infectious disorder, including infective endocarditis, myocarditis, or complications not diagnosable by other imaging modalities; **OR**
  - Known or suspected pericardial disease, including **ANY** of the following[6]:
    - Pericardial effusion; **OR**
    - Structural pericardial anomalies; **OR**
    - Pericardial thickening; **OR**
    - Tamponade; **OR**
    - Pericarditis; **OR**
  - Evaluation of cancer-related cardiotoxicity and radiation-induced heart disease[6]; **OR**
  - Post-cardiac transplant assessment of acute or chronic rejection[6]; **OR**
  - Cardiac trauma-related conditions, including iatrogenic injury[7]; **OR**
  - Cardiovascular conditions, known or suspected, including **ANY** of the following:
    - Suspected intracardiac thrombus, mass, aneurysm, or pseudoaneurysm when echocardiogram is indeterminate[8]; **OR**
    - Cardiomyopathies, including **ANY** of the following:
      - Hypertrophic cardiomyopathy[9]; **OR**
      - Suspected arrhythmogenic cardiomyopathy of ventricular origin; **OR**
  - Preoperative or pre-treatment evaluation, including **ANY** of the following:
    - Atrial septal defect/patent foramen ovale (ASD/PFO) closure if transesophageal echocardiogram (TEE) is indeterminate; **OR**

- Aortic root replacement; **OR**
- Pacemaker placement planning, including the evaluation of the coronary vein before biventricular pacing; **OR**
- Pulmonary vein ablation therapy for cardiac dysrhythmia; **OR**
- Surgical valve replacement; **OR**
- Surgical myectomy or septal ablation for hypertrophic cardiomyopathy; **OR**
- Transcatheter left atrial appendage occlusion; **OR**
- Planning for aortic endovascular valve replacement; **OR**
- Post-procedure follow-up or complication to evaluate complications of valve repair or replacement (open or endovascular) including **ANY** of the following:
  - Leaflet thrombosis; **OR**
  - Pannus formation; **OR**
  - Paravalvular leak; **OR**
  - Pseudoaneurysms; **OR**
  - Root abscess; **OR**
- Ventricular assist device placement; **OR**
- Pre-procedural planning for atrial fibrillation-related procedures[10], including **ANY** of the following:
  - Left atrial ablation (pulmonary vein isolation); **OR**
  - Electrical cardioversion or pharmacologic cardioversion when an indicated TEE has a contraindication or is unable to be completed; **OR**
- Planned transcatheter treatment and the patient has valvular heart disease with **ANY** of the following:
  - Mitral replacement or repair; **OR**
  - Pulmonary replacement or repair; **OR**
  - Transcatheter aortic; **OR**
  - Tricuspid replacement or repair; **OR**

○ Congenital anomalies and variants (e.g., cardiac, vascular), including **ANY** of the following as indicated in cited references[6,11,12]:
- **ANY** of the following:
  - Aortic and pulmonary anomalies; **OR**
  - Atrial and ventricular septal defects; **OR**
  - Coronary artery anomalies; **OR**
  - Left-sided cardiac obstructive disorders; **OR**
  - Right-sided cardiac obstructive disorders; **OR**

        - Systemic and pulmonary venous anomalies; **OR**
        - Other complex structural disorders of the cardiac chambers, morphology, and valves (e.g., heterotaxy); **OR**
    - Follow-up of corrected or palliated congenital heart disease and assessment of postoperative complications (e.g., shunt or conduit stenosis, thrombosis, pseudoaneurysms) in children and adults; **OR**
    - Postoperative evaluation of corrected or palliated congenital heart disease, including **ANY** of the following:
        - Pseudoaneurysms; **OR**
        - Stenosis (shunt/conduit); **OR**
        - Thrombosis; **OR**
- Repeat imaging (defined as a repeat request following recent imaging of the same anatomic region with the same or similar modality) will be considered reasonable and necessary if **ALL** of the following are **TRUE**:
    - There are no established guidelines; **AND**
    - **ANY** of the following:
        - There are new or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
        - There is need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
        - In the absence of change in symptoms, there is an established need for monitoring which would influence management.

Cardiac magnetic resonance imaging (MRI) with stress testing is considered appropriate with **ANY** of the following[2,4]:

- Patients experiencing new, recurrent, or worsening cardiac symptoms, including otherwise unexplained anginal equivalent[A] symptoms, and **ANY** of the following:
    - Physical inability to perform a maximum exercise workload; **OR**
    - New or previously unrecognized or uninterpretable electrocardiogram (ECG), as qualified by **ANY** of the following:
        - Complete left bundle branch block (and right bundle branch does not render ECG uninterpretable for ischemia); **OR**
        - Ventricular paced rhythm; **OR**
        - Pre-excitation patterns (such as Wolff-Parkinson-White); **OR**
        - Greater than 1 mm ST segment depression; **OR**

        - Left ventricular hypertrophy (LVH) with repolarization abnormalities, also called LVH with strain; **OR**
        - Patient on digoxin therapy; **OR**
    - A history of coronary artery disease (CAD) based on a prior anatomic evaluation of the coronary arteries; **OR**
    - A history of coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI); **OR**
    - Syncope for patients with an intermediate or high coronary heart disease (CHD) risk (ATP III risk criteria) and where cardiac etiology is suspected based on an initial evaluation, including history, physical examination, or ECG and the patient is unable to exercise; **OR**
    - Evidence or high suspicion of ventricular arrhythmias; **OR**
    - Worsening or continuing symptoms after normal or submaximal exercise stress test with suspicion of a false negative result; **OR**
    - Patients with recent equivocal or borderline testing where ischemia remains a concern; **OR**
    - Patients on beta blocker, calcium channel blocker, and/or antiarrhythmic medication where an adequate workload may not be attainable for a fully diagnostic exercise study; **OR**
    - 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); **OR**
    - Evaluation of chest pain syndrome after revascularization, or in patients with intermediate to high pre-test probability for CAD regardless of ECG interpretability or ability to exercise; **OR**
    - High pre-test probability for CAD regardless of ECG interpretability or the ability to exercise, and a decision to perform cardiac catheterization or other angiography has not already been made; **OR**
    - Patients with hypertrophic cardiomyopathy (HCM); **OR**
- New-onset atrial fibrillation (with no prior cardiac evaluation); **OR**
- Patients with disease conditions associated with CAD with no stress imaging evaluation performed within the preceding 2 years and are unable to exercise; **OR**
- Patients without clear cardiac symptoms in the presence of an elevated cardiac troponin; **OR**
- Patients without cardiac symptoms who have not undergone an evaluation for CAD within the past 2 years (stress echocardiogram, SPECT MPI, PET MPI, CMR, coronary computed tomography angiography [CCTA],

cardiac catheterization), and are unable to exercise, who underwent **ANY** of the following procedures:
    - PCI (with stent) more than 2 years prior to evaluation for CAD; **OR**
    - CABG procedure more than 5 years prior to evaluation for CAD; **OR**
- Patients with established CAD who experienced an ACS event (ST-segment elevation myocardial infarction [STEMI], non-ST elevation myocardial infarction [NSTEMI], or unstable angina) within the past 90 days, provided they did not undergo coronary angiography at the time of the acute event and are currently clinically stable; **OR**
- Evaluating new, recurrent, or worsening left ventricular dysfunction/congestive heart failure; **OR**
- 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; **OR**
- Preoperative cardiac evaluation in patients not able to exercise and who will be undergoing noncardiac surgery with **ANY** of the following:
    - Intermediate risk for surgery (cardiac risk 1-5%), poor (less than 4 metabolic equivalents [METs]) or unknown functional capacity, inability to exercise adequately, or ECG uninterpretable for ischemia; **OR**
    - High-risk for surgery (greater than 5% cardiac risk), poor (less than 4 METs) or unknown functional capacity, inability to exercise adequately, or ECG uninterpretable for ischemia; **OR**
- Asymptomatic patients with a coronary calcium Agatston score greater than 400; **OR**
- Planned cardiac or other solid-organ transplant when no cardiac evaluation has been performed within the past year; **OR**
- Patients who will be treated with interleukin-2 products for various malignant disorders; **OR**
- Patients with HCM, when echocardiography is inconclusive or there are poor echocardiographic imaging windows; **OR**
- Patients with HCM, when echocardiography is inconclusive, or there are poor echocardiographic imaging windows; **OR**
- Evaluation of transplant coronary artery disease (TCAD) or cardiac allograft vasculopathy (CAV) in patients with a history of organ transplantation; **OR**

- Patients with recently demonstrated coronary stenosis of uncertain functional significance in a major coronary branch on an anatomic imaging study (coronary angiogram or CCTA); **OR**
- Repeat imaging (defined as a repeat request following recent imaging of the same anatomic region with the same or similar modality) will be considered reasonable and necessary if **ALL** of the following are **TRUE**:
  - There are no established guidelines; **AND**
  - **ANY** of the following:
    - There are new or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
    - There is need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
    - In the absence of change in symptoms, there is an established need for monitoring which would influence management.

Non-Indications

Cardiac magnetic resonance imaging (MRI) without stress testing is not considered appropriate if **ANY** of the following is **TRUE**:

- The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or worsening symptoms[13]; **OR**
- The request is for a low-field MRI, which is considered experimental and investigational imaging.[14,15]

Cardiac magnetic resonance imaging (MRI) with stress testing is not considered appropriate if **ANY** of the following is **TRUE**:

- The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or worsening symptoms[13]; **OR**
- Routine screening for CAD in asymptomatic patients with diabetes mellitus[2,4]; **OR**
- Routine stress testing in asymptomatic patients with abnormal prior stress imaging[2,4]; **OR**
- Routine stress testing in asymptomatic patients with obstructive or nonobstructive CAD without a revascularization procedure[2,4]; **OR**

- Exercise testing or radiologic imaging within the first 2 years following PCI without specific symptoms (e.g., chest pain, ECG changes, etc.)[2,4]; **OR**
- Exercise stress testing performed in patients with **ANY** of the following[2,4]:
  - Acute myocardial infarction within 2 to 4 days; **OR**
  - High-risk unstable angina; **OR**
  - Uncontrolled cardiac arrhythmias causing symptoms or hemodynamic compromise; **OR**
  - Symptomatic severe aortic stenosis; **OR**
  - Decompensated or uncontrolled congestive heart failure; **OR**
  - The patient has a systolic blood pressure (BP) at rest greater than 200 mmHg or a diastolic BP at rest greater than 110 mmHg; **OR**
  - Acute pulmonary embolus or pulmonary infarction; **OR**
  - Acute myocarditis or pericarditis; **OR**
  - Acute aortic dissection; **OR**
  - Severe pulmonary hypertension; **OR**
  - Acute symptomatic medical illness; **OR**
- The request is for a low-field MRI, which is considered experimental and investigational imaging.[14,15]

*NOTE: MRI in patients with claustrophobia should be requested at the discretion of the ordering provider.
**NOTE: MRI in pregnant patients should be requested at the discretion of the ordering provider and obstetric care provider

Definitions

[A]**Angina equivalent**: Any constellation of clinical findings that the physician believes is consistent with CAD manifestations. Examples of such findings include, but are not limited to: pain, pressure, tightness, or discomfort in the chest, shoulders, arms, neck, back, upper abdomen, or jaw, new ECG abnormalities, or other symptoms/findings suggestive of CAD. Clinical presentations in the absence of chest pain (e.g., dyspnea with exertion, fatigue, or reduced/worsening effort tolerance) consistent with a high risk of CAD may be considered an ischemic equivalent.[16]

Level of Care Criteria

Inpatient or Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
75557	Cardiac magnetic resonance imaging (MRI) without contrast material, for evaluation of morphology and function
75559	Cardiac magnetic resonance imaging (MRI) with stress imaging, without contrast material, for evaluation of morphology and function
75561	Cardiac magnetic resonance imaging (MRI) without contrast material, followed by contrast material and further sequences, for evaluation of morphology and function
75563	Cardiac magnetic resonance imaging (MRI) with stress imaging, without contrast material, followed by contrast material and further sequences, for evaluation of morphology and function
75565	Cardiac magnetic resonance imaging (MRI) for velocity flow mapping (List separately in addition to code for primary procedure)
C9762	Cardiac magnetic resonance imaging (MRI) for morphology and function, quantification of segmental dysfunction; with strain imaging
C9763	Cardiac magnetic resonance imaging (MRI) for morphology and function, quantification of segmental dysfunction; with stress imaging
S8042	Magnetic resonance imaging (MRI), low-field

Disclaimer: S Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

Evaluation of Clinical Harms and Benefits

Clinical determinations for Medicare Advantage beneficiaries are made in accordance with 42 CFR 422.101 guidance outlining CMS's required approach to decision hierarchy in the setting of NCDs/LCDs identified as being "not fully established". When clinical coverage criteria are "not fully established," Medicare Advantage organizations are instructed to create publicly accessible clinical coverage criteria based on widely accepted clinical guidelines and/or scientific studies backed by a robust clinical evidence base. Clinical coverage criteria provided by Cohere Health in this manner include coverage rationale and risk/benefit analysis.

Clinical coverage criteria for magnetic resonance imaging (MRI), cardiac with stress testing were fully defined and established by NCDs and/or LCDs. Cohere Health did not supplement this policy with any additional criteria or interpretations.

The potential clinical harms of using these criteria for MRI, cardiac without stress testing may include:

- There is a risk of malfunction of implanted medical devices (e.g., implanted pacemakers, cochlear implants).
- A potential exists for allergic reactions to contrast material, if used in the study. The MRI department staff will monitor the patient for an allergic reaction and treat as recommended by a physician.[6]
- Use of gadolinium-based contrast is not recommended during pregnancy or in patients with acute or chronic kidney injury or disease.[17]
- If sedation is used for the study (for anxiety or claustrophobia), there is a risk of over-sedation. The patient will be monitored during the procedure to reduce this risk.
- There is an uncertain risk for MR imaging in pregnant patients. The decision to image in a pregnant patient should be made on an individual basis in consultation with the patient's obstetric provider.[18]
- Adverse effects from delayed or denied treatment, such as increased risk of cardiac events or worsening cardiac diseases (e.g., coronary artery disease, heart disease).[19]
- Increased healthcare costs and complications from the inappropriate use of additional interventions.[20]

The clinical benefits of using these criteria for MRI, cardiac without stress testing include:

- Maintenance of rigorous patient safety standards aligned to best available evidence.
- Improved therapeutic yield for MRI, cardiac, resulting in better long-term outcomes. Among patients who are referred for invasive angiography, those who are evaluated by cardiac MRI experience higher rates of revascularization and therefore improved treatment efficacy as compared to patients who are not imaged with cardiac MRI.[21]
- Appropriate allocation of healthcare resources at the individual beneficiary and population levels. Noninvasive cardiac procedures are less costly, associated with fewer complications, and preferred by both patients and providers.[22,23]

Medical Evidence

Miller et al. (2023) CMR-IMPACT (Cardiac Magnetic Resonance Imaging Strategy for the Management of Patients with Acute Chest Pain and Detectable to Elevated Troponin) trial conducted from September 2013 to July 2018 at four U.S. tertiary care hospitals. The trial involved the management of patients with acute chest pain and detectable elevated troponin levels. The 312 participants were randomized into two care pathways: invasive-based (156 participants) and CMR-based (156 participants), with adjustments permitted based on the patient's condition. The primary outcome measured was a composite of death, myocardial infarction, and cardiac-related hospital readmissions or emergency visits. The study followed 312 participants (mean age 60.6 years, 59.9% women) over a median of 2.6 years. The authors conclude no significant difference between clinical and safety outcomes. Benefits include reducing the long-term utilization of invasive angiography, positive discharge outcomes, and enhanced therapeutic yield of angiography. (Clinicaltrials.gov Identifier NCT01931852).[21]

Alabed et al. (2020) performed a meta-analysis concerning patient mortality due to pulmonary arterial hypertension (PAH). A total of 1938 patients in 22 studies were included. Research indicates that CMR-derived metrics for right ventricular (RV) volume and function, rather than left ventricular (LV) measurements, predict clinical deterioration. This insight is pertinent for regulatory authorities seeking clinically relevant trial endpoints. Further, this meta-analysis reaffirms the prognostic significance of CMR metrics across a large patient cohort, enabling assessment of how changes in these metrics relate to clinical outcomes such as worsening health and mortality. The authors reaffirm CMR as a useful prognostic marker in PAH among a large cohort. The study confirms that RV function, RV, and left ventricular volumes predict mortality and clinical deterioration in PAH. The study underscores the rationale for using CMR as a meaningful clinical endpoint in trials testing PAH therapies.[24]

Kwong et al. (2019) conducted a retrospective study to evaluate the diagnostic and prognostic value. The study enrolled 2349 patients with chest pain syndrome at 13 centers in 11 states. The median follow-up was 5.4 years. A stress CMR showing no ischemia or LGE was linked to a very low incidence of adverse cardiac events in patients with stable intermediate-risk chest pain syndromes. Subsequent cardiac testing was also reduced. (Clinicaltrials.gov Identifier NCT03192891).[25]

References

1. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination (NCD) Magnetic resonance imaging (MRI)(220.2). Revision Effective Date April 10, 2018. https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?ncdid=177&ncdver=6&keyword=mri&keywordType=starts&areaId=all&docType=NCD&contractOption=all&sortBy=relevance&bc=1
2. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determination (LCD). Cardiology Non-emergent outpatient stress testing (L35083). Revision Effective Date April 25, 2021. https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=38396&ver=25&lcdStatus=all&sortBy=title&bc=6
3. Centers for Medicare & Medicaid Services (CMS). Billing and Coding: Cardiology non-emergent outpatient stress testing (A56423). Updated October 1, 2023. https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleId=56423&ver=56
4. Centers for Medicare and Medicaid Services (CMS). Local coverage determination (LCD). Cardiology non-emergent outpatient stress testing (L38396). Revision Effective Date April 25, 2021. https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=35083&ver=108&lcdStatus=all&sortBy=title&bc=6
5. Centers for Medicare & Medicaid Services (CMS). Billing and Coding: Cardiology Non-emergent outpatient stress testing (A56952). Updated October 1, 2023. https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleId=56952&ver=47
6. American College of Radiology (ACR), North American Society for Cardiovascular Imaging (NASCI), Society for Pediatric Radiology (SPR). ACR–NASCI–SPR practice parameter for the performance and interpretation of cardiac magnetic resonance imaging (MRI) (resolution 42). Published 2021. Accessed June 27, 2024. https://www.acr.org/-/media/ACR/Files/Practice-Parameters/MR-Cardiac.pdf

7. Malik SB, Hsu JY, et al. ACR appropriateness criteria - infective endocarditis. *J Am Coll Radiol*. 2021 May;18(5S):S52-S61. doi: 10.1016/j.jacr.2021.01.010
8. Batlle JC, Kirsch J, et al. ACR appropriateness criteria - chest pain, possible acute coronary syndrome. *J Am Coll Radiol*. 2020 May;17(5S):S55-S69. doi: 10.1016/j.jacr.2020.01.027
9. Doherty JU, Kort, Mehran R, Schoenhagen P, Soman P. 2019 appropriate use criteria for multimodality imaging in nonvalvular heart disease. Published January 7, 2019. Accessed December 4, 2023. https://www.acc.org/latest-in-cardiology/ten-points-to-remember/2019/01/04/18/00/2019-auc-for-multimodality-imaging-in-nonvalvular-heart-disease
10. Doherty JU, Kort S, et al. 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: A report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and the Society of Thoracic Surgeons. *J Am Soc Echocardiogr*. 2019 May;32(5):553-579. doi: 10.1016/j.echo.2019.01.008
11. Bolen MA, Saeedan MNB, et al. ACR appropriateness criteria - dyspnea-suspected cardiac origin (ischemia already excluded): 2021 update. *J Am Coll Radiol*. 2022 May;19(5S):S37-S52. doi: 10.1016/j.jacr.2022.02.014
12. Sirajuddin A, Mirmomen SM, et al. ACR appropriateness criteria - suspected pulmonary hypertension: 2022 update. *J Am Coll Radiol*. 2022 Nov;19(11S):S502-S512. doi: 10.1016/j.jacr.2022.09.018
13. Wasser EJ, Prevedello LM, Sodickson A, Mar W, Khorasani R. Impact of a real-time computerized duplicate alert system on the utilization of computed tomography. *JAMA Intern Med*. 2013;173(11):1024-1026. doi:10.1001/jamainternmed.2013.543

14. Hori M, Hagiwara A, Goto M, Wada A, Aoki S. Low-Field Magnetic Resonance Imaging: Its History and Renaissance. *Invest Radiol*. 2021;56(11):669-679. doi:10.1097/RLI.0000000000000810
15. Arnold TC, Freeman CW, Litt B, Stein JM. Low-field MRI: Clinical promise and challenges. *J Magn Reson Imaging*. 2023;57(1):25-44. doi:10.1002/jmri.28408
16. Darrow M. Ordering and understanding the exercise stress test. *Am Fam Physician*. 1999 Jan 15;59(2):401-10
17. American College of Radiology (ACR). ACR manual on contrast media. 2024. https://www.acr.org/-/media/ACR/Files/Clinical-Resources/Contrast_Media.pdf
18. American College of Obstetricians & Gynecologists (ACOG). Guidelines for Diagnostic Imaging During Pregnancy and Lactation. 2017. Accessed September 9, 2024. https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2017/10/guidelines-for-diagnostic-imaging-during-pregnancy-and-lactation
19. Lahoti N, Jabbour RJ, Ariff B, Wang BX. Cardiac MRI in cardiomyopathies. *Future Cardiol*. 2022;18(1):51-65. doi:10.2217/fca-2020-0233
20. Kjelle E, Brandsæter IØ, Andersen ER, Hofmann BM. Cost of low-value imaging worldwide: a systematic review. *Applied Health Economics and Health Policy*. 2024 Mar 1:1-7
21. Miller CD, Mahler SA, Snavely AC, et al. Cardiac magnetic resonance imaging versus invasive-based strategies in patients with chest pain and detectable to mildly elevated serum troponin: A randomized clinical trial. *Circ Cardiovasc Imaging*. 2023 Jun;16(6):e015063. doi:10.1161/CIRCIMAGING.122.015063
22. Thompson RC, Bateman TM, Blankstein R, Di Carli MF, Heydari B, Hung J, Kwong RY, Lindner JR, Nieman K, Dorbala S. A policy statement on cardiovascular test substitution and authorization: Principles of patient-centered noninvasive testing. *Journal of the American College of Cardiology*. 2021 Sep 28;78(13):1385-9
23. Safavi KC, Li SX, Dharmarajan K, Venkatesh AK, Strait KM, Lin H, Lowe TJ, Fazel R, Nallamothu BK, Krumholz HM. Hospital variation in the use of

noninvasive cardiac imaging and its association with downstream testing, interventions, and outcomes. *JAMA internal medicine*. 2014 Apr 1;174(4):546-53

24. Alabed S, Shahin Y, Garg P, et al. Cardiac-MRI predicts clinical worsening and mortality in pulmonary arterial hypertension: A systematic review and meta-analysis. *JACC Cardiovasc Imaging*. 2021 May;14(5):931-942. doi: 10.1016/j.jcmg.2020.08.013
25. Kwong RY, Ge Y, Steel K, et al. Cardiac magnetic resonance stress perfusion imaging for evaluation of patients with chest pain. *J Am Coll Cardiol*. 2019 Oct 8;74(14):1741-1755. doi: 10.1016/j.jacc.2019.07.074

Policy Revision History/Information

Original Date: October 3, 2024		
Review History		
Version 2	10/02/2025	Annual review. Updated repeat imaging indications. Updated “with stress testing” section to ensure alignment with L35083 & L38396, including non-indications. Split non-indications into “without stress testing” and “with stress testing” sections. Revised Harms and Benefits section.