

Evolent Clinical Guideline 2019 021 for Chest (Thorax) Magnetic Resonance Imaging (MRI)

Guideline or Policy Number:	Applicable Codes			
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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

Chest Magnetic Resonance Imaging (MRI) generates images of the organs and structures within the chest (thorax) without the use of ionizing radiation. Chest MRI images are affected by motion artifact from respiration, thus is generally not used for evaluation of the lung parenchyma.

INDICATIONS FOR CHEST MRI

Chest Wall Pain and Injuries

- Non-traumatic chest wall pain ~~after initial with normal imaging (such as chest x-ray or rib x-ray) with any ONE of the following has been performed and Chest CT is contraindicated or cannot be performed~~⁽¹⁾
 - Signs and symptoms of infection, ~~with concern for chest wall involvement~~, such as fever, elevated inflammatory markers, known infection at other sites
 - History of ~~known or chest radiation or chest surgery suspected cancer (no prior x-ray needed)~~
- Suspected chest wall injuries (such as musculotendinous, costochondral cartilage, sternoclavicular joint, and manubriosternal joint injuries) after non-diagnostic or indeterminate prior imaging (such as x-ray or ultrasound) when imaging will potentially alter management

Brachial Plexopathy ⁽²⁻⁵⁾

- **Traumatic** Brachial Plexopathy: If mechanism of injury is highly suspicious for brachial

plexopathy (such as birth trauma, mid-clavicular fracture, shoulder dislocation, contact injury to the neck (burner or stinger syndrome) or penetrating injury) ⁽⁶⁾

- **Non-traumatic** Brachial Plexopathy (including neurogenic thoracic outlet syndrome) when Electromyography/Nerve Conduction Velocity (EMG/NCV) studies are suggestive of brachial plexopathy

NOTE: Either Neck MRI, Shoulder MRI or Chest MRI may be appropriate depending on the location of the injury/plexopathy. Only **ONE** of these three studies should beis needed to appropriately image the brachial plexusis indicated.

Vascular Disease ⁽⁵⁾

- Superior vena cava (SVC) syndrome when CTA/MRA are contraindicated or cannot be performed ⁽⁷⁾
- Subclavian Steal Syndrome after positive or inconclusive ultrasound when CTA/MRA are contraindicated or cannot be performed ⁽⁸⁾
- Neurogenic or venous thoracic outlet syndromewhen CTA/MRA are contraindicated or cannot be performed ⁽⁹⁾
- Arterial thoracic outlet syndrome when CTA and /MRA are contraindicated or cannot be providedperformed ⁽⁹⁾
- Pulmonary hypertension when other testing (echocardiogram or right heart catheterization) is suggestive of the diagnosis ^(10,11)

Thoracic Aortic Disease ^(12–14)

Acute Aortic Syndromes (AAS)

- For **suspected** acute aortic syndrome (AAS) (such as aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer) with any ONE of the following:
 - Other Prior imaging (such as echocardiogram) is suggestive of AAS **OR**
 - Individual is either:
 - **High risk** patient for AAS and **one** sign/symptom concerning for AAS:~~OR non-high risk and two or more signs/symptoms of AAS~~
 - **High risk** conditions for AAS:
 - Marfan's syndrome or other connective tissue disease, family history of aortic disease, known aortic valve disease, recent aortic manipulation and/or known thoracic aortic aneurysm
 - **Signs and symptoms** concerning for AAS:
 - Chest, back or abdominal pain described as abrupt onset, severe in intensity and/or ripping or tearing in quality
 - Pulse deficit or systolic blood pressure differential
 - Focal neurologic deficit with pain

- New heart murmur with pain
- Hypotension or shock
- Non-high-risk patient and two or more signs/symptoms concerning for AAS (see above)
- For follow-up of **known** aortic syndromes, including aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer: frequency for follow up is as clinically indicated
- Suspected vascular cause of dysphagia (from vascular compression of the esophagus) or expiratory wheezing (from vascular compression of the trachea/bronchus) with prior imaging that is indeterminate or abnormal.

Postoperative Follow-up of Aortic Repair

- Follow-up thoracic endovascular aortic repair (TEVAR) at the following intervals^(12,14):
 - Baseline study at 1 month post-EVAR
 - Annually thereafter if stable
 - More frequent imaging (as clinically indicated) may be needed if there are complications or abnormal findings on surveillance imaging
 - After 5 post-operative years without complications, continuing follow-up every 5 years should be considered
- Follow up after thoracic aorta open repair at the following intervals:
 - At one year post-repair
 - Every 5 years thereafter
- If abnormal findings are seen on any surveillance imaging study, imaging is then done annually

Congenital Malformations

- Congenital heart disease with pulmonary hypertension⁽¹⁵⁾
- Known or suspected pulmonary sequestration⁽¹⁶⁾
- Congenital non-cardiac non-vascular thoracic malformation on other imaging (such as chest x-ray, echocardiogram, gastrointestinal study or CT)^(16,17)
- Chest wall malformations (such as pectus excavatum, pectus carinatum, scoliosis) in patients with cardiorespiratory symptoms for whom treatment is being considered⁽¹⁸⁾

Evaluation of Tumor

- Mediastinum
- Thymoma screeningEvaluation for suspected thymoma in Myasthenia Gravis patients⁽¹⁹⁾

- For further evaluation of mediastinal masses on prior imaging ⁽²⁰⁾
- Chest Wall ^(21,22)
 - For further evaluation of chest wall mass after prior indeterminate imaging
- Other Chest Masses ⁽²²⁾
 - For further evaluation of chest mass when prior imaging suggests MRI as the next step rather than CT

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT ~~PROCEDURAL EVALUATION~~

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to catheter ablation in patients with atrial fibrillation ⁽²³⁾
- Imaging of the area is needed to develop Pre-operative evaluation for a planned surgical plan or procedure

Postoperative/procedural Evaluation

- ~~Post-surgical follow-up when records document medical reason requiring additional imaging~~
- After catheter ablation in patients with atrial fibrillation if complications are suspected ⁽²³⁾
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS ~~ON PRIOR IMAGING~~

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.).

IMAGING IN KNOWN GENETIC CONDITIONS

SYNDROMES AND RARE DISEASES

- ADPKD (Autosomal Dominant Polycystic Kidney Disease) AND family history of thoracic aortic dissection: every 2 years (including at diagnosis)⁽²⁴⁾
NOTE: either cardiac MRI or Chest MRI is indicated for surveillance, not both
- BAP1-TPDS (BAP-1 tumor predisposition syndrome): with clinical concerns for malignant mesothelioma⁽²⁵⁾
- Cystic Fibrosis - chest MRI (or CT) every 2 years and as needed to assess for bronchiectasis⁽²⁶⁾
- Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1): annually starting at age 8 Chest MRI (or CT)^(27,28)
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study AND conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Abdomen/Pelvis MRI and Chest CT

- Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1)^(27,28):
 - Chest/Abdomen/Pelvis Annually starting at age 8
 - NOTE: Brain/Chest/Abdomen/Pelvis Every 3 years include Brain MRI

OTHER COMBINATION STUDIES WITH CHEST MRI

NOTE: When medical necessity is met for an individual study AND conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest MRA (or CTA) and Chest MRI

- When needed for clarification of vascular involvement invasion from tumor

Sinus/Face/Neck/Chest/Abdomen MRI

- Advanced imaging for Granulomatosis with Polyangiitis (GPA) (Formerly Wegener's Granulomatosis) is indicated with any ONE of the following⁽²⁹⁾:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area is needed to guide

systemic therapy decisions

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

CPT Codes

71550, 71551, 71552, +0698T

Applicable Lines of Business

<input checked="" type="checkbox"/>	CHIP (Children's Health Insurance Program)
<input checked="" type="checkbox"/>	Commercial
<input checked="" type="checkbox"/>	Exchange/Marketplace
<input checked="" type="checkbox"/>	Medicaid
<input checked="" type="checkbox"/>	Medicare Advantage

BACKGROUND

~~Magnetic Resonance Imaging (MRI) is a noninvasive imaging technique for detection and evaluation of various disease and conditions in the chest, e.g., congenital anomalies and aneurysms. MRI may be used instead of computed tomography (CT) in patients with allergies to radiographic contrast or with impaired renal function. Also, to decrease radiation exposure, Chest MRI may be used rather than CT when repeated imaging is expected (i.e., surveillance).~~

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)

- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Nontraumatic Chest Wall Pain ⁽¹⁾

Study Design: This document is an update of the ACR Appropriateness Criteria for Nontraumatic Chest Wall Pain, developed by a multidisciplinary expert panel. It includes an extensive analysis of current medical literature from peer-reviewed journals.

Target Population: Patients presenting with nontraumatic chest wall pain, including those with no history of malignancy, known or suspected malignancy, suspected infectious or inflammatory conditions, and history of prior chest intervention.

Key Factors: Recommendations for initial and secondary imaging strategies, including radiography, CT, MRI, ultrasound, bone scan, and PET/CT. Specific guidelines for different clinical scenarios such as chest wall pain with no history of malignancy, known or suspected malignancy, and suspected infectious or inflammatory conditions. Evaluation of the diagnostic performance of various imaging modalities in detecting chest wall pain.

ACR Appropriateness Criteria® Plexopathy: 2021 Update ⁽⁴⁾

Study Design: This document is an update of the ACR Appropriateness Criteria for Plexopathy, developed by a multidisciplinary expert panel. It includes an extensive analysis of current medical literature from peer-reviewed journals.

Target Population: Patients presenting with brachial or lumbosacral plexopathy due to various pathologies such as trauma, nerve entrapment, neoplasm, inflammation, infection, autoimmune disease, hereditary disease, and idiopathic etiologies.

Key Factors: Recommendations for initial imaging strategies, including MRI, CT, ultrasound, and PET/CT. Specific guidelines for different clinical scenarios such as nontraumatic plexopathy, traumatic plexopathy, and plexopathy in the context of known malignancy or post-treatment syndrome. Evaluation of the diagnostic performance of various imaging modalities in detecting plexopathy.

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines ⁽¹²⁾

Study Design: This document is a clinical practice guideline developed by the American Heart Association (AHA) and the American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines. It is based on a comprehensive literature review conducted from January 2021 to April 2021, including studies, reviews, and other evidence published in English.

Target Population: The guideline is intended for clinicians managing patients with aortic

disease, including asymptomatic, stable symptomatic, and acute aortic syndromes.

Key Factors: Recommendations for diagnosis, genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance of patients with aortic disease. Detailed guidelines on imaging techniques such as computed tomography, magnetic resonance imaging, echocardiography, and ultrasound. Emphasis on the role of multidisciplinary aortic teams and shared decision-making.

ANALYSIS OF EVIDENCE

Analysis ^(1,4,12)

In summary, while all three articles highlight the importance and diagnostic accuracy of MRI, they differ in their specific focus areas, imaging techniques, and clinical scenarios. The shared conclusions emphasize MRI's non-invasive nature and its critical role in providing detailed anatomical and pathological information. The differing conclusions reflect the unique considerations and recommendations for using MRI in diagnosing aortic disease, plexopathy, and chest wall pain.

Shared Conclusions

- **Importance of MRI:** All three articles emphasize the importance of MRI in diagnosing various conditions. MRI is highlighted for its superior soft-tissue contrast and ability to provide detailed anatomical and pathological information.
- **Non-invasive Nature:** MRI is consistently noted for being a non-invasive imaging modality, making it a preferred choice for patients who need detailed imaging without the risks associated with invasive procedures.
- **Diagnostic Accuracy:** The articles agree on the high diagnostic accuracy of MRI in identifying and characterizing lesions, whether they are related to aortic disease, plexopathy, or chest wall pain.

POLICY HISTORY

Date	Summary
<u>July 2025</u>	<ul style="list-style-type: none"> ● <u>Added a Summary of Evidence and Analysis of Evidence</u>
<u>June 2025</u>	<ul style="list-style-type: none"> ● <u>This guideline replaces Evolent Clinical Guideline 021 for Chest (Thorax) MRI</u> ● <u>Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices</u> ● <u>Updated Vascular Disease section with neurogenic or venous thoracic outlet syndrome and arterial thoracic outlet syndrome indications</u>

Date	Summary
	<ul style="list-style-type: none"> ● <u>Acute Aortic Syndromes section:</u> <ul style="list-style-type: none"> ○ <u>Added non-high risk</u> ○ <u>Added suspected vascular cause of dysphagia</u> ● <u>Updated language in the preoperative/postoperative section</u> ● <u>Adjusted surveillance for MEN-1 in genetics section</u> ● <u>Added combinations section for genetics</u> ● <u>Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated</u> ● <u>Added Sinus/Face/Neck/Chest/Abdomen MRI combo</u> ● <u>Applicable Line of Business adjusted – Medicare checked</u> ● <u>Reduced background section</u>
June 2024	<ul style="list-style-type: none"> ● Brachial plexopathy to be consistent with other relevant guidelines ● Acute aortic syndromes aligned with other Guidelines and given more detail ● Added section for Genetic Syndromes ● Added Contraindications and Preferred studies section to the Background ● Added Combination Studies section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider



agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

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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