# Cohere Medical Policy - Magnetic Resonance (MR) Spectroscopy

***Clinical Policy for Medical Necessity Review***

**Version:** 3
**Cohere Health UMC Approval Date: August 28, 2025**
Last Annual Review: August 28, 2025
Revision: Not Applicable
Next Annual Review: August 28, 2026

# 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:



Fee schedules, relative value units, conversion factors and/or related components are not assigned by the AMA, are not part of CPT, and the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein.



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## Policy Information:

**Specialty Area:** Diagnostic Imaging
**Policy Name:** Cohere Policy - Magnetic Resonance (MR) Spectroscopy
**Type:** [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

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# Medical Necessity Criteria

***Service: Magnetic Resonance (MR) Spectroscopy***

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 for lack of medical necessity due to 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 there are multiple diagnostic or therapeutic procedures requested simultaneously or within the past three 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
- 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 with a single study or procedure.
- Cohere Health evaluates imaging exams based on medical necessity, regardless of contrast use. 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.

## Description

Magnetic resonance spectroscopy (MRS) is a noninvasive diagnostic test that measures biochemical changes in the brain, muscles, and other organs. It primarily evaluates metabolic disorders, tumors, and other lesions. MRS provides additional information to conventional magnetic resonance imaging (MRI) by measuring the concentration of specific metabolites, such as N-acetylaspartate (NAA), choline (Cho), creatine (Cr), and myoinositol (mI).[1,2]

MRS is particularly valuable in grading and assessing types of brain tumors and in assessing metabolic changes associated with tumor progression or response to therapy. For example, high choline levels can indicate increased cell membrane turnover associated with tumor growth, while reduced NAA levels may suggest neuronal loss or dysfunction.[2] Additionally, MRS can help differentiate between tumor recurrence and radiation necrosis, aiding in treatment planning and monitoring.[2]

## Medical Necessity Criteria

### Indications

**Magnetic resonance spectroscopy (MRS)** is considered appropriate when **ANY** of the following is **TRUE**:

- **ALL** of the following:
  - Conventional imaging by magnetic resonance imaging (MRI) or computed tomography (CT) is inconclusive; **AND**
  - **ANY** of the following is **TRUE**:
    - Neoplastic conditions (including masses or mass-like conditions) and **ANY** of the following is **TRUE**:
      - Grading of primary glial neoplasm, particularly high-grade versus low-grade glioma[2]; **OR**
      - Evaluation of brain tumors, including differentiation between tumor recurrence and radiation necrosis[2-4]; **OR**
      - Intraaxial brain tumors, including primary neoplasms and metastatic disease[5]; **OR**
      - Posttreatment surveillance in a patient with a known history of brain tumor[5]; **OR**
    - Neonatal hypoxic ischemic encephalopathy[6]; **OR**
    - Congenital conditions as indicated by **ANY** of the following:
      - Diagnosis and evaluation of metabolic disorders such as mitochondrial diseases and inborn errors of metabolism[7]; **OR**
      - Inherited metabolic disorders (e.g., Canavan disease, mitochondrial encephalopathies, and other leukodystrophies)[8]; **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

**Magnetic resonance spectroscopy (MRS)** 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[9].

*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.
***NOTE: Patients with renal insufficiency where gadolinium contrast is contraindicated, and MRS requires contrast administration. Alternative imaging modalities should be considered in such cases.

## Level of Care Criteria

Inpatient or Outpatient

## Procedure Codes (CPT/HCPCS)

| CPT/HCPCS Code | Code Description |
|---|---|
| 76390 | Magnetic resonance spectroscopy |

# Medical Evidence

Weinberg et al. (2021) conducted a systematic review of the literature regarding the clinical applications of magnetic resonance spectroscopy (MRS) in brain tumors. The writers state that MRS is utilized in clinical practice as well as research applications. The diagnostic clinical relevance of MRS includes its use as a type of virtual biopsy, as well as distinguishing gliomas from other types of diagnoses such as edema, necrosis, infection or lymphoma. It is recommended by the group to use MRS in conjunction with conventional MRI due to occasional overlap in the appearance of different conditions. In tumor grading, distinction between high and low grade gliomas can be achieved with MRS. Limitations of MRS use in brain tumor imaging include similarities in appearance of different diseases despite differentiation of tissue types. Image quality may be affected by equipment variability and artifact.[2]

In a 2022 systematic review of the literature, Germano et al. updated the 2014 Congress of Neurological Surgeons evidence-based guidelines on the management of progressive glioblastoma (pGBM) in adults. The literature search range was between 2012 to 2019, with 237 full-text articles extracted from 8786 total abstracts. The group made two new level II recommendations based upon this review, with an additional 21 level III recommendations. The level II recommendations included use of diffusion-weighted images included with magnetic resonance images with and without contrast in diagnosis of patients with GBM as well as for surveillance. The other new level II recommendation related to surgical procedures.[4]

Feldmann and colleagues (2022) examined MR-spectroscopy in metachromatic leukodystrophy (MLD) in a controlled cohort study consisting of 29 patients (10 infants, 19 juveniles) and 12 controls in 53 MRS datasets. MLD spectra were found to differ from the control group. White matter revealed the greatest differences compared to gray matter. Infant patients were found to have more severe changes when compared to later-onset patients in *N*-acetylaspartate (NAA), aspartate, glutamine, and choline intervals. It was concluded that NAA seemed to be the most clinically meaningful biomarker correlating with urine measurements obtained during the study.[8]

# References


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# Policy Revision History/Information

| Original Date: August 15, 2024 | | |
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| **Review History** | | |
| Version 1 | 08/15/2024 | New policy development |
| Version 2 | 10/30/2024 | Edited repeat imaging criteria language. |
| Version 3 | 08/28/2025 | Annual review<br><br>Updated content layout to align with revised template, including repeat imaging criteria |