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## Subject: Magnetic Resonance Spectroscopy (MRS)

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### DESCRIPTION:

Magnetic resonance spectroscopy (MRS) is a noninvasive technique that can be used to measure the concentrations of different chemical components within tissues. The technique is based on the same physical principles as magnetic resonance imaging (MRI) and the detection of energy exchange between external magnetic fields and specific nuclei within atoms. The information produced by MRS is displayed graphically as a spectrum with peaks consistent with the various chemicals detected. MRS may be performed as an adjunct to MRI. An MRI image is first generated, and then MRS spectra are developed at the site of interest, termed the voxel. While an MRI provides an anatomic image of the brain, MRS provides a functional image related to underlying dynamic physiology. The information produced by MRS is used to assist in planning a course of treatment. MRS can be performed with existing MRI equipment, modified with additional software and hardware. Multiple software packages for performing proton MRS have received clearance by the U.S. Food and Drug Administration (FDA) through the 510(k) process.

**Summary and Analysis of Evidence:** Magnetic resonance spectroscopy (MRS) is a proven and useful method for the evaluation, assessment of severity, therapeutic planning, post-therapeutic monitoring, and follow-up of diseases of the brain and other regions of the body. (ACR, 2019) MR spectroscopy and MR perfusion using choline/N-acetyl aspartate (Cho/NAA) and choline/creatine (Cho/Cr) ratios and relative cerebral blood volume (rCBV) may increase the accuracy of differentiating necrosis from recurrent tumor in patients with primary brain tumors or metastases (Chuang, 2016).

### POSITION STATEMENT:

Magnetic resonance spectroscopy (MRS) **meets the definition of medical necessity** for the following indications:

- Evaluation of recurrent or residual brain tumor from post-therapy changes

- For further evaluation of a brain lesion to differentiate brain tumor from other non-tumor diagnoses.

## BILLING/CODING INFORMATION:

### CPT Coding:

76390	Magnetic resonance spectroscopy
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## REIMBURSEMENT INFORMATION:

Refer to section entitled [POSITION STATEMENT](#).

Re-imaging or additional imaging due to poor contrast enhanced exam or technically limited exam is the responsibility of the imaging provider.

## PROGRAM EXCEPTIONS:

**Federal Employee Plan (FEP):** Follow FEP guidelines.

**Medicare Advantage products:** No Local Coverage Determination (LCD) or National Coverage Determination (NCD) was found at the time of the last guideline reviewed date.

## DEFINITIONS:

No guideline specific definitions apply.

## RELATED GUIDELINES:

None applicable.

## OTHER:

Other names used to report magnetic resonance spectroscopy:

Magnetic resonance spectroscopy imaging (MRSI)  
NMR (nuclear magnetic resonance) spectroscopy  
Proton magnetic resonance spectroscopy (1H-MRS)  
Proton spectroscopy

## REFERENCES:

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## COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 04/25/24.

## GUIDELINE UPDATE INFORMATION:

07/26/01	New Medical Coverage Guideline.
08/15/01	Annual review of Investigational status – no changes.
08/15/02	Reviewed. Revised to include National Medicare coverage change to non-covered (investigational). Added references.
09/15/03	Annual review. Maintain investigational status.
10/15/05	Annual review. Revised Medical Coverage Guideline from investigational to medically necessary when used to differentiate residual brain tumor from post-therapy changes (e.g., delayed radiation necrosis); or differentiate brain tumor from other non-tumor diagnoses (e.g., abscesses or other infectious or inflammatory processes). Revised description. Updated other section, added other names used to report MRS. Updated references.
07/15/06	Scheduled Review. Added investigational statement for non-covered conditions: epilepsy, Alzheimer’s disease, Parkinson’ disease, multiple sclerosis, bipolar disorder, prostate cancer, diagnosing unexplained chest pain, detection and monitoring of neurometabolic diseases, disorders of muscle, and breast lesions. Deleted Medicare Advantage products program exception. Updated references.
07/01/07	Updated Program Exception section.
08/15/07	Review, coverage statements maintained, guideline reformatted, references updated.
01/21/08	Updated Program Exceptions.
07/15/08	Scheduled reviewed. No change in position statements. Added magnetic resonance spectroscopy imaging (MRSI) to the other section. Updated references.
07/01/09	Updated BCBSF Radiology Management program exception; removed Federal Employee Plan (FEP) from BCBSF Radiology Management program exception statement, added FEP program exception statement: FEP is excluded from the National Imaging Associates (NIA) review; follow FEP guidelines and added BlueSelect.
09/15/09	Annual review. Maintain position statements. Added Medicare program exception. Updated references.
08/15/11	Updated BCBSF Radiology Management Program exception.
09/15/11	Annual review. Updated description section; deleted information regarding the study of MRS. Maintain position statements. Updated references.
12/15/13	Annual review. Maintain position statements. Added FEP and Medicare program exception. Updated references.
01/01/15	Scheduled review; maintain position statement. Updated references.
06/15/18	Revision; revised position statement. Updated references.
03/15/20	Review/Revision. Revised medical necessity criteria. Deleted experimental or investigational position statement. Updated references.

05/15/22	Review/update. No change in position statement. Updated references.
07/01/22	Revision to Program Exceptions section.
09/30/23	Review: position statements and references updated.
05/15/24	Review; no change in position statement. Updated references.