

MEDICAL POLICY

MEDICAL POLICY DETAILS

Medical Policy Title	Magnetic Resonance Spectroscopy (MRS)
Policy Number	6.01.03
Category	Technology Assessment
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Committee Approval Date	07/19/01, 09/19/02, 09/18/03, 07/15/04, 01/05/05, 07/21/05, 05/18/06, 05/17/07, 08/16/07, 06/19/08, 06/18/09, 11/18/10, 11/17/11, 11/15/12, 01/18/24
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Deletion Date	(DELETED: 05/27/10-11/18/10)
Product Disclaimer	<ul style="list-style-type: none"> Services are contract dependent; if a product excludes coverage for a service, it is not covered, and medical policy criteria do not apply. If a commercial product (including an Essential Plan or Child Health Plus product), medical policy criteria apply to the benefit. If a Medicaid product covers a specific service, and there are no New York State Medicaid guidelines (eMedNY) criteria, medical policy criteria apply to the benefit. If a Medicare product (including Medicare HMO-Dual Special Needs Program (DSNP) product) covers a specific service, and there is no national or local Medicare coverage decision for the service, medical policy criteria apply to the benefit. If a Medicare HMO-Dual Special Needs Program (DSNP) product DOES NOT cover a specific service, please refer to the Medicaid Product coverage line.

POLICY STATEMENT

- I. Based upon our criteria and assessment of the peer-reviewed literature, magnetic resonance spectroscopy (MRS) has been medically proven to be effective and, therefore, is considered **medically appropriate** for **ANY** of the following indications when conventional imaging by magnetic resonance imaging (MRI) or computed tomography (CT) provides limited information:
 - A. Distinguish recurrent brain tumor from radiation necrosis as an alternative to positron emission tomography (PET).
 - B. Diagnosis of certain rare inborn errors of metabolism affecting the Central Nervous System (CNS) (primarily pediatric individuals).
 - C. Evidence or suspicion of primary or secondary neoplasm (pretreatment and posttreatment).
 - D. Grading of primary glial neoplasm, particularly high-grade versus low-grade glioma.
 - E. Evidence or suspicion of brain infection, especially cerebral abscess (pretreatment and posttreatment) and human immunodeficiency virus (HIV)-related infections.
 - F. Seizures, especially temporal lobe epilepsy.
- II. Based upon our criteria and assessment of peer-reviewed literature, MRS has not been medically proven to be effective and, therefore, is considered **investigational** for all other indications.

Refer to Corporate Medical Policy #11.01.03 Experimental and Investigational Services

Refer to Corporate Medical Policy #6.01.29 Positron Emission Tomography (PET) Oncologic Applications

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POLICY GUIDELINE

Some indications may be determined by positron emission tomography (PET) or MRS, only one technique (PET or MRS) should be performed, not both.

DESCRIPTION

MRS is a non-invasive procedure used to measure the concentrations of different low molecular weight chemicals within tissues. It is also known as nuclear magnetic resonance (NMR) spectroscopy. MRS utilizes the same equipment as magnetic resonance imaging (MRI), modified with additional software and hardware, but applies different signals or frequencies to acquire information. In MRI, the frequency is determined by spatial position, whereas, in MRS, the chemical content of the substance scanned determines the frequency. While an MRI provides an anatomic image, MRS provides a functional image related to underlying dynamic physiology. It has become possible to integrate MRS with routine MRI, so that local abnormalities detected by MRI can also be examined biochemically by MRS before and after therapeutic interventions. An MRI image is first generated, and then MRS spectra are developed at the site of interest, termed the voxel.

In normal brain tissue, MRS depicts the following principal spectral peaks: N-acetyl groups, especially N-acetylaspartate (NAA); choline-containing compound (Cho), such as a membrane phospholipid (e.g., phosphocholine or glycerophosphocholine); and creatine and phosphocreatine.

MRS has been studied most extensively in a variety of brain pathologies. Different spectral patterns in both healthy and diseased brains are the basis of clinical applications of MRS. MRS findings characteristically associated with non-necrotic brain tumors include elevated Cho levels and reduced NAA levels. Peripheral applications of MRS include the study of myocardial ischemia, peripheral vascular disease, and skeletal muscle. Applications in non-CNS oncologic evaluation have also been explored.

RATIONALE

Although there are studies available regarding MRS, controlled clinical trials are limited. However, small studies have indicated that MRS can change patient management in the determination of cerebral tumor versus abscess or other infectious or inflammatory process, and cerebral tumor versus radiation necrosis. Studies with small sample size and methodological flaws indicate potential future use of MRS for evaluation of prostate cancer, breast cancer, cervical cancer, pancreatic cancer, esophageal cancer, and myocardial ischemia.

Several clinical trials, in various stages, are studying MRS for several indications, including prostate cancer, brain metabolism, breast cancer, and human immunodeficiency virus (HIV).

National Comprehensive Cancer Network (NCCN) guidelines for central Nervous System Cancers states that MRS may be useful in differentiating tumor from radiation necrosis; maybe helpful in grading tumors or assessing response. The limitations noted are tumors near vessels, air spaces, or bone.

National Institute for Health and Care Excellence (NICE) guidelines for Brain Tumours (primary) and brain metastases in over 16s states:

- Consider advanced MRI techniques, such as MR perfusion and MR spectroscopy, to assess the potential of a high-grade transformation in a tumor appearing to be low grade on standard structural MRI for suspected gliomas.
- Consider advanced MRI techniques, such as MR perfusion, diffusion tensor imaging and MR spectroscopy, if findings from standard imaging are unclear about whether there is recurrence and early identification is potentially clinically useful as a follow up for brain metastases or gliomas.

CODES

- *Eligibility for reimbursement is based upon the benefits set forth in the member's subscriber contract.*
- *CODES MAY NOT BE COVERED UNDER ALL CIRCUMSTANCES. PLEASE READ THE POLICY AND GUIDELINES STATEMENTS CAREFULLY.*
- *Codes may not be all inclusive as the AMA and CMS code updates may occur more frequently than policy updates.*

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- *Code Key: Experimental/Investigational = (E/I), Not medically necessary/ appropriate = (NMN).*

CPT Codes

Code	Description
76390	Magnetic resonance spectroscopy
0609T (E/I)	Magnetic resonance spectroscopy, determination and localization of discogenic pain (cervical, thoracic, or lumbar); acquisition of single voxel data, per disc, on biomarkers (i.e., lactic acid, carbohydrate, alanine, laal, propionic acid, proteoglycan, and collagen) in at least 3 discs
0610T (E/I)	transmission of biomarker data for software analysis
0611T (E/I)	postprocessing for algorithmic analysis of biomarker data for determination of relative chemical differences between discs
0612T (E/I)	interpretation and report

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Code	Description
No code(s)	

ICD10 Codes

Code	Description
C71.0-C71.9	Malignant neoplasm of brain (code range)
C79.31-C79.49	Secondary malignant neoplasm of brain and other parts of the nervous system (code range)
G03.9	Meningitis, unspecified
G04.90	Encephalitis and encephalomyelitis, unspecified
G04.91	Myelitis, unspecified
G06.0	Intracranial abscess and granuloma
G37.4	Subacute necrotizing myelitis of central nervous system
G46.0-G46.8	Vascular syndromes of brain in cerebrovascular diseases (code range)
I67.89	Other cerebrovascular disease
I68.0	Cerebral amyloid angiopathy
I68.8	Other cerebrovascular disorders in diseases classified elsewhere
R56.9	Unspecified convulsions

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*Key Article

KEY WORDS

MRS, Nuclear magnetic resonance spectroscopy, Nuclear MRS, Proton magnetic resonance spectroscopy; Proton MRS

CMS COVERAGE FOR MEDICARE PRODUCT MEMBERS

There is currently a National Coverage Determination (NCD) for Magnetic Resonance Spectroscopy (220.21). Please refer to the following NCD website for Medicare Members: [<https://www.cms.gov/medicare-coverage-database/view/ncd.aspx?ncdid=287&ncdver=2&bc=AgAAgAAAAAAAA&=>] accessed 11/16/23