

MEDICAL POLICY



MEDICAL POLICY DETAILS	
Medical Policy Title	MAGNETIC RESONANCE SPECTROSCOPY (MRS)
Policy Number	6.01.03
Category	Technology Assessment
Effective Date	09/16/99
Revised 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
Archived Date	11/21/13
Edited Date	06/19/14, 06/18/15, 02/18/16, 02/16/17, 02/15/18, 02/21/19 (DELETED: 05/27/10-11/18/10)
Product Disclaimer	<ul style="list-style-type: none"> • 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 product) or a Medicaid product covers a specific service, medical policy criteria apply to the benefit. • If a Medicare 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.

POLICY STATEMENT

- I. Based upon our criteria and review of the peer-reviewed literature, magnetic resonance spectroscopy (MRS) has been medically proven to be effective and therefore, **medically appropriate** for the following indications:
 - A. Differentiation of cerebral tumor versus abscess, or infectious or inflammatory process; and
 - B. Differentiation of cerebral tumor versus radiation necrosis.
- II. Based upon our criteria and review of peer-reviewed literature, magnetic resonance spectroscopy 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 regarding Positron Emission Tomography (PET) Oncologic Applications

POLICY GUIDELINES

- I. Although some indications may be determined by positron emission tomography (PET) or MRS, only one technique (PET or MRS) should be performed, not both.
- II. The Federal Employee Health Benefit Program (FEHBP/FEP) requires that procedures, devices or laboratory tests approved by the U.S. Food and Drug Administration (FDA) may not be considered investigational and thus these procedures, devices or laboratory tests may be assessed only on the basis of their medical necessity

DESCRIPTION

Magnetic Resonance Spectroscopy (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.

Medical Policy: MAGNETIC RESONANCE SPECTROSCOPY (MRS)

Policy Number: 6.01.03

Page: 2 of 4

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

MRS has been studied most extensively in a variety of brain pathologies. Different spectral patterns in both the healthy and diseased brain 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

The basic hardware for MRS is substantially equivalent to that used for conventional MRI. A number of MRI scanners have received 510(k) clearance for marketing by the FDA for use in the United States. Multiple software packages for performing proton MRS have received clearance by the FDA through the 510(k) process since 1993. The FDA requires specific clearance of probes for different neutron probes for MRS.

Although there are many 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 very small sample size and methodological flaws indicate possible future use of MRS for evaluation of prostate cancer, breast cancer, cervical cancer, pancreatic cancer, esophageal cancer, and myocardial ischemia.

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

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.

CPT Codes

Code	Description
76390	Magnetic resonance spectroscopy

Copyright © 2019 American Medical Association, Chicago, IL

HCPCS Codes

Code	Description
No code(s)	

ICD10 Codes

Code	Description
C71.5	Malignant neoplasm of cerebral ventricle
C71.6	Malignant neoplasm of cerebellum
C79.31-C79.49	Malignant neoplasm of brain and other part of the nervous system (code range)
G03.9	Meningitis, unspecified
G04.90	Encephalitis and encephalomyelitis, unspecified
G04.91	Myelitis, unspecified

Proprietary Information of Excellus Health Plan, Inc.

Medical Policy: MAGNETIC RESONANCE SPECTROSCOPY (MRS)

Policy Number: 6.01.03

Page: 3 of 4

Code	Description
G06.0	Intracranial abscess and granuloma
G37.4	Subacute necrotizing myelitis of central nervous system
G46.3-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

REFERENCES

*Agency for Healthcare Research and Quality (AHRQ). Magnetic resonance spectroscopy for brain tumors. Technology Assessment 2003 Jun 13.

BlueCross BlueShield Association. Magnetic resonance spectroscopy. Medical Policy Reference Manual Policy #6.01.24. 2017 Sep 14.

*BlueCross BlueShield Association Technology Evaluation Center. Magnetic resonance spectroscopy for evaluation of suspected brain tumor. TEC Assessment Program. 2003 Jun;18(1).

Bolan PJ. Magnetic resonance spectroscopy of the breast: current status. Magn Reson Imaging Clin N Am 2013 Aug;21(3):625-9.

Elias AE, et al. MR spectroscopy using normalized and non-normalized metabolite ratios for differentiating recurrent brain tumor from radiation injury. Acad Radiol 2011;18:1101-8.

*Hollingworth W, et al. A systematic literature review of magnetic resonance spectroscopy for the characterization of brain tumors. AJNR Am J Neuroradiol 2006 Aug;27(7):1404-11.

Javali TD., et al. Magnetic resonance spectroscopy imaging-directed transrectal ultrasound biopsy increased prostate cancer detection in men with prostate-specific antigen between 4-10 ng/ml and normal digital rectal examination. Int J Urol 2014;21:257-62.

Kumar V, et al. Prebiopsy magnetic resonance spectroscopy and imaging in the diagnosis of prostate cancer. Int J Urol 2012 Jul;19(7):602-613.

Perdonà S, et al. Combined magnetic resonance spectroscopy and dynamic contrast-enhanced imaging for prostate cancer detection. Urol Oncol 2013 Aug;31(6):761-5.

*Rock JP, et al. Correlations between magnetic resonance spectroscopy and image-guided histopathology, with special attention to radiation necrosis. Neurosurg 2002 Oct;51(4):912-9.

Sciarra A, et al. Value of magnetic resonance spectroscopy imaging and dynamic contrast-enhanced imaging for detecting prostate cancer foci in men with prior negative biopsy. Clin Cancer Res 2010;16:1875-83.

Targosz-Gajniak MG, et al. Magnetic resonance spectroscopy as a predictor of conversion of mild cognitive impairment to dementia. J Neurol Sci 2013 Dec 15;335(1-2):58-63.

Valenti AL, et al. Locally advanced prostate cancer: three dimensional magnetic resonance spectroscopy to monitor prostate response to therapy. Int J Radiat Oncol Biol Phys 2012 Nov 1;84(3):719-24.

Vargas HA, et al. MR imaging of treated prostate cancer. Radiology 2012 Jan;262(1):26-42.

*Zeng QS, et al. Distinction between recurrent gliomas and radiation injury using magnetic resonance spectroscopy in combination with diffusion-weighted imaging. Int J Radiat Oncol Biol Phys 2007 May 1;68(1):151-8.

*Zeng, QS, et al. Multivoxel proton MR spectroscopy in the distinction of recurrent gliomas from radiation injury. J Neurooncol 2007 Aug;84(1):63-9.

Medical Policy: MAGNETIC RESONANCE SPECTROSCOPY (MRS)

Policy Number: 6.01.03

Page: 4 of 4

*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. Please refer to the following websites for Medicare Members: <http://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=287&ncdver=1&bc=AgAAgAAAAAAA&>.