MAGNETIC SOURCE IMAGING (MSI)  
RAD601.038  

COVERAGE:

Magnetic Source Imaging (combining magnetoencephalography and magnetic resonance imaging) is not eligible for coverage, as this combination of diagnostic radiologic testing is considered investigational.

DESCRIPTION:

**Magnetic Source Imaging (MSI)** is a non-invasive technique that combines a functional image via magnetoencephalography (MEG) and an anatomical image via magnetic resonance image (MRI) to provide a higher resolution image. As areas of the brain become active, a magnetic field is generated, which can be measured outside of the skull. Sensitive magnetic detectors known as Superconducting Quantum Interference Devices (SQUIDs) identify these small magnetic fields. The magnetic fields are superimposed over a MRI. It is potentially more accurate than the electrical fields of an electroencephalogram (EEG), because the magnetic fields are not distorted or weakened by the skull or scalp. Using MSI may preserve critical sensorimotor areas of the brain during neurosurgery. In normal situations, these areas can be identified anatomically by MRI, but frequently the underlying disease processes distort the anatomy. In addition, the location of critical sensorimotor areas varies among normal, disease free patients. MSI is also known as neuroimaging or neuro-magnetic brain function mapping. Alternative techniques include MRI, EEG, Stereotactic Electroencephalography (SEEG), Electrocorticography (ECoG), Positron Emission Tomography (PET), or Single Photon Emission Computerized Tomography (SPECT) scanning.

MSI has principally been investigated as an alternative to invasive monitoring for screening of surgical candidates and as a guide to surgical planning in those patients scheduled to undergo neurosurgery for epilepsy, brain neoplasms, arteriovenous malformations, traumatic brain injury, or other brain disorders. MSI is being used in the diagnosis of psychiatric and digestive disorders.

RATIONALE:

MSI is an evolving technique; in terms of the number and configuration of the SQUID detection coils used, and also in the mathematical models used to evaluate the recorded data. While there is extensive literature on MSI, the bulk of it is devoted to its technical capability and small anecdotal case series. There are no studies that provide a statistical analysis of its diagnostic performance compared to other techniques.

Validation of the applications of MSI requires further study of sensitivity, specificity, and positive/negative predictive value compared to invasive monitoring. Avoidance of an invasive procedure is a valued health outcome, but the risk-benefit ratio cannot be evaluated until the comparative diagnostic capabilities of the
technologies are known. In addition, the literature concludes that the results of the small studies are encouraging, but that larger scale trials are needed to validate the precision and utility of MSI.

No literature was found in MEDLINE where MSI was utilized as a diagnostic tool for digestive disorders. Without any information, this procedure is assumed to be under investigation.

DISCLAIMER:

State and federal law, as well as contract language, including definitions and specific inclusions/exclusions, takes precedence over Medical Policy and must be considered first in determining coverage. The member’s contract benefits in effect on the date that services are rendered must be used. Any benefits are subject to the payment of premiums for the date on which services are rendered. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically. HMO Blue Texas physicians who are contracted/affiliated with a capitated IPA/medical group must contact the IPA/medical group for information regarding HMO claims/reimbursement information and other general polices and procedures.

Blue Cross and Blue Shield of Texas, a Division of Health Care Service Corporation, a Mutual Legal Reserve Company
Southwest Texas HMO, Inc. d/b/a HMO Blue Texas
* Independent Licensees of the Blue Cross and Blue Shield Association

Posted Jan. 7, 2003