



# MASSACHUSETTS

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## Medical Policy Navigated Transcranial Magnetic Stimulation

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### Policy Number: 596

BCBSA Reference Number: 2.01.90

NCD/LCD: Local Coverage Determination (LCD): Category III CPT® Codes (L33392)

### Related Policies

- Magnetoencephalography and Magnetic Source Imaging, [#137](#)
- Intraoperative Neurophysiologic Monitoring (Sensory- Evoked Potentials, Motor-Evoked Potentials, EEG Monitoring), [#211](#)

### Policy

#### Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Medicare HMO Blue<sup>SM</sup> and Medicare PPO Blue<sup>SM</sup> Members

Navigated transcranial magnetic stimulation is **INVESTIGATIONAL** for all purposes, including but not limited to the preoperative evaluation of patients being considered for brain surgery, when localization of eloquent areas of the brain (eg, controlling verbal or motor function) is an important consideration in surgical planning.

### Prior Authorization Information

#### Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

#### Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	This is <b>not</b> a covered service.
Commercial PPO and Indemnity	This is <b>not</b> a covered service.
Medicare HMO Blue <sup>SM</sup>	This is <b>not</b> a covered service.
Medicare PPO Blue <sup>SM</sup>	This is <b>not</b> a covered service.

## CPT Codes / HCPCS Codes / ICD Codes

*Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.*

*Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.*

### CPT Codes

There is no specific procedure codes.

### Description

Surgical management of brain tumors involves resecting the brain tumor and preserving essential brain function. "Mapping" of brain functions, such as body movement and language, is considered to be most accurately achieved with DCS, an intraoperative procedure that increases operating time and requires a wide surgical opening. Even if not completely accurate compared with DCS, preoperative techniques that map brain functions may aid in planning the extent of resection and the operative approach. Although DCS is still usually performed to confirm the brain locations associated with specific functions, preoperative mapping techniques may provide useful information that improves patient outcomes.

The most commonly used tool for the noninvasive localization of brain functions is functional magnetic resonance imaging (fMRI). fMRI identifies regions of the brain where there are changes in localized cortical blood oxygenation, which correlates with neuronal activity associated with a specific motor or speech task being performed as the image is obtained. The accuracy and precision of fMRI is dependent on the patient's ability to perform the isolated motor task, such as moving the single assigned muscle without moving others. This may be difficult in patients in whom brain tumors have caused partial or complete paresis. The reliability of fMRI in mapping language areas has been questioned. Guissani et al (2010) reviewed several studies comparing fMRI and DCS of language areas and found large variability in sensitivity and specificity of fMRI.<sup>1</sup> The discussion also pointed out a major conceptual point in how fMRI and DCS "map" language areas: fMRI identifies regional oxygenation changes, which show that a particular region of the brain is involved in the capacity of interest, whereas DCS locates specific areas in which the activity of interest is disrupted. Regions of the brain involved in a certain activity may not necessarily be required for that activity and could theoretically be safely resected.

Magnetoencephalography (MEG) also is used to map brain activity. In this procedure, electromagnetic recorders are attached to the scalp. In contrast to electroencephalography, MEG records magnetic fields generated by electric currents in the brain, rather than the electric currents themselves. Magnetic fields tend to be less distorted by the skull and scalp than electric currents, yielding improved spatial resolution. MEG is conducted in a magnetically-shielded room to screen out environmental electric or magnetic noise that could interfere with the MEG recording.

nTMS is a noninvasive imaging method for the evaluation of eloquent brain areas. Transcranial magnetic pulses are delivered to the patient as a navigation system calculates the strength, location, and direction of the stimulating magnetic field. The locations of these pulses are registered to a magnetic resonance imaging (MRI) image of the patient's brain. Surface electromyography (EMG) electrodes are attached to various limb muscles of the patient. Moving the magnetic stimulation source to various parts of the brain causes EMG electrodes to respond, indicating the part of the cortex involved in particular muscle movements. For evaluation of language areas, magnetic stimulation areas that disrupt specific speech tasks are thought to identify parts of the brain involved in speech function. nTMS can be considered a noninvasive alternative to DCS, in which electrodes are directly applied to the surface of the cortex during craniotomy. nTMS is being evaluated as an alternative to other noninvasive cortical mapping techniques, such as fMRI and MEG, for presurgical identification of cortical areas involved in motor and language functions.

## Summary

Navigated transcranial magnetic stimulation (nTMS) is a noninvasive imaging method for the evaluation of eloquent brain areas (eg, controlling motor or language function). nTMS is being evaluated as an alternative to other noninvasive cortical mapping techniques for presurgical identification of eloquent areas.

Overall, the literature on nTMS is at a preliminary stage for demonstrating effectiveness. Relatively small studies have demonstrated the distance between nTMS hotspots and direct cortical stimulation (DCS) hotspots for the same muscle. Although the average distance in most studies is 1 cm or less, this does not take into account the degree of error in this average distance, or whether there are missed hotspots. It is difficult to fully verify nTMS hotspots because only exposed cortical areas can be verified with DCS. Limited studies of nTMS to evaluate language areas show a high false positive rate (low specificity) and sensitivity that may be insufficient for clinical use. Two studies with methodologic limitations showed similar postoperative motor deficits and improved incidence of complete resection in patients with brain tumors who underwent preoperative evaluation with nTMS compared with historical controls; progression-free survival (PFS) was improved with nTMS in one subgroup. Another study attempted to demonstrate how clinical decision making has been changed as a result of nTMS results. These studies do not provide strong evidence of the efficacy of nTMS. Based on the limited evidence available and results of clinical vetting, nTMS is considered investigational for all indications.

## Policy History

Date	Action
1/2018	Clarified coding information.
7/2017	New references added from BCBSA National medical policy.
7/2016	New references added from BCBSA National medical policy.
2/2015	BCBSA National medical policy review. Policy title changed (acronym deleted).
5/2014	New medical policy describing investigational indications. Effective 5/1/2014.

## Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

## References

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