

LAC+USC MEDICAL CENTER POLICY

Subject: TRANSCRANIAL MAGNETIC STIMULATION – ADULT OUTPATIENT PSYCHIATRY CLINIC	Original Issue Date: 8/23/19	Policy: 960
	Supersedes:	Effective Date: 8/23/19
Departments Consulted: Department of Psychiatry	Reviewed & Approved by: Attending Staff Association Executive Committee Senior Executive Council	Approved by: (Signature on File) Chief Medical Officer
		(Signature on File) Chief Executive Officer

PURPOSE

The purpose of this policy is to define responsibilities of the health care team involved in the management of patients who receive outpatient Transcranial Magnetic Stimulation (TMS) as treatment for diagnosis of unipolar depression who have not responded to one or more antidepressants and to ensure safe and effective patient outcomes.

POLICY

1. The psychiatrist and any other provider performing the procedure will have successfully completed Magstim’s TMS Therapy System Training or an equivalent training and submit documentation of such training.
2. The psychiatrist will be onsite and available for direct supervision during the procedure.
3. The psychiatrist and any other provider performing the procedure will comply with all operating instructions and guidelines contained in the current Magstim TMS Therapy System User Manual and supplements/updates thereto.
4. The provider uses one of the following validated, evidence-based depression monitoring tools: HAM-D, MADRS, IDS-SR, PHQ-9 or QIDS for monitoring treatment response and remission.
5. For female patients of reproductive age, initial and weekly urine pregnancy tests should be performed to determine if there is a contraindication to initiate or to continue TMS.

DEFINITIONS

- TMS is a non-invasive method of brain stimulation that relies on electromagnetic induction using an insulated coil placed over the scalp, focused on an area of the brain thought to play a role in mood regulation. The coil generates brief magnetic pulses, which pass easily and painlessly through the skull and into the brain. The pulses generated are of the same type and strength as those generated by magnetic resonance imaging (MRI) machines. When these pulses are administered in rapid succession, it is referred to as “repetitive TMS” or “rTMS”, which can produce longer lasting changes in brain activity.

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- Repetitive TMS has been shown to be a safe and well-tolerated procedure that can be an effective treatment for patients with depression who have not benefited from antidepressant medications or cannot tolerate antidepressant medications due to side-effects.

EQUIPMENT

Magstim Rapid 2 Therapy System

PROCEDURE

1. As rTMS uses magnetic pulses, patients will be screened prior to initiation of treatment to ensure there are no contraindications (see section titled Contraindications below).
2. Before beginning a treatment, patients are asked to remove any magnetic sensitive objects (such as jewelry, credit cards).
3. Patients are required to wear earplugs during treatment for their comfort and hearing protection, as rTMS produces a loud clicking sound with each pulse, much like an MRI machine. Patients are seated during each session of rTMS.
4. During the first rTMS session, the psychiatrist measures the patient's motor threshold by administering several brief pulses to the area of the patient's brain that controls motor movement (specifically the left precentral gyrus). The motor threshold is defined as the minimum amount of power necessary to make the patient's thumb twitch, and varies from individual to individual. Measuring the motor threshold helps the physician personalize the treatment settings and determine the amount of energy required to stimulate brain cells.
5. Once the motor threshold is determined, the coil is moved forward so that it rests above the front of the patient's brain (specifically the left dorsolateral prefrontal cortex). Treatment is then commenced. During the treatment, patients will hear a series of clicking sounds and will feel a tapping sensation under the treatment coil.
6. The motor threshold is not checked at every treatment but may be reassessed if there is concern it may have changed, for example, because of a change in medication.
7. Repetitive TMS involves a series of treatment sessions. Treatment sessions vary in length depending on the TMS coil used and the number of pulses delivered but typically last around 30-40 minutes. Patients receive TMS 5 days a week. A typical course of rTMS is 4-6 weeks. However, this can vary depending on an individual's response to treatment.
8. Following the acute course of treatment, maintenance treatment may be indicated. Treatment plans will be individualized.

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Potential Side Effects

- 30% of patients experience facial twitching or painful sensations while magnetic coil is turned on during treatment.
- 50% experience headaches during initial phase of treatment.
- Potential risk of hearing impairment without use of protective ear plugs.
- Small risk of emergence of mania.
- Extremely small risk of seizure production (less than 0.1 to 0.5% of patients receiving TMS treatments) in patients without history of seizures or family history of seizures.

Contraindications

1. Seizure – patient history of seizure disorder or family history of seizures
2. Acute mania
3. Implanted metallic hardware within 30cm of magnetic coil

TMS should not be used by anyone who has non-removable magnetic-sensitive metal in their head or within twelve inches of the magnetic coil. Failure to follow this restriction could result in serious injury or death. Objects that may have this kind of metal include:

- a. Aneurysm clips or coils
 - b. Stents in the neck or brain
 - c. Implanted stimulators
 - d. Cardiac pacemakers or implantable cardioverter defibrillator (ICD)
 - e. Cardiac stents
 - f. Electrodes to monitor brain activity
 - g. Metallic implants in the ears or eyes
 - h. Shrapnel or bullet fragments
 - i. Facial tattoos with metallic or magnetic-sensitive ink
4. Pregnancy

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Long-Term Adverse Effects

There are no known long-term adverse effects reported with the use of rTMS. However, as this is a relatively new treatment, there may be unforeseen risks in the long-term that are currently unknown.

Research

If approved through appropriate research committees, the use of TMS may be extended for the treatment of other mental disorders for research purposes.

RESPONSIBILITY

Outpatient Psychiatry

REFERENCES

- Eranti S, Mogg A, Pluck G, et al. A randomized, controlled trial with 6-month follow-up of repetitive transcranial magnetic stimulation and electroconvulsive therapy for severe depression. Am J Psychiatry 2007; 164:73.
- George MS, Lisanby SH, Avery D, et al. Daily left prefrontal transcranial magnetic stimulation therapy for major depressive disorder: a sham-controlled randomized trial. Arch Gen Psychiatry 2010; 67:507.
- Perera T, George MS, Grammer G, et al. The Clinical TMS Society Consensus Review and Treatment Recommendations for TMS Therapy for Major Depressive Disorder. Brain Stimul 2016; 9:336.
- Lefaucher JP, Andre-Obadia N, Antal A, et al. Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS). Clin Neurophysiol 2014; 125:2150.
- George MS, Post RM. Daily left prefrontal repetitive transcranial magnetic stimulation for acute treatment of medication-resistant depression. Am J Psychiatry 2011; 168:356