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Subject: Transcranial Magnetic Stimulation

THIS MEDICAL COVERAGE GUIDELINE IS NOT AN AUTHORIZATION, CERTIFICATION, EXPLANATION OF BENEFITS, OR A GUARANTEE OF PAYMENT, NOR DOES IT SUBSTITUTE FOR OR CONSTITUTE MEDICAL ADVICE. ALL MEDICAL DECISIONS ARE SOLELY THE RESPONSIBILITY OF THE PATIENT AND PHYSICIAN. BENEFITS ARE DETERMINED BY THE GROUP CONTRACT, MEMBER BENEFIT BOOKLET, AND/OR INDIVIDUAL SUBSCRIBER CERTIFICATE IN EFFECT AT THE TIME SERVICES WERE RENDERED. THIS MEDICAL COVERAGE GUIDELINE APPLIES TO ALL LINES OF BUSINESS UNLESS OTHERWISE NOTED IN THE PROGRAM EXCEPTIONS SECTION.

DESCRIPTION:

Transcranial magnetic stimulation (TMS) is a noninvasive method of delivering electrical stimulation to the brain. A magnetic field is delivered through the skull where it induces electric currents that affect neuronal function. Navigating transcranial magnetic stimulation (nTMS) is being evaluated as a treatment for neurological disorders.

TMS was initially used to investigate nerve conduction; for example, TMS over the motor cortex will produce a contralateral muscular-evoked potential.The technique involves placement of a small coil over the scalp; a rapidly alternating current is passed through the coil wire, which produces a magnetic field that passes unimpeded through the scalp and bone, resulting in electrical stimulation of the cortex.

Interest in the use of TMS as a treatment for depression was augmented by the development of a device that could deliver rapid, repetitive stimulation. Imaging studies had shown a decrease in activity of the left dorsolateral prefrontal cortex (DLPFC) in depressed patients, and early studies suggested that high frequency (e.g., 5–10 Hz) TMS of the left DLPFC had antidepressant effects. Low frequency (1–2 Hz) stimulation of the right DLPFC has also been investigated. The rationale for low frequency TMS is inhibition of right frontal cortical activity to correct the interhemispheric imbalance. A combination approach (bilateral stimulation), or deep stimulation with an H1 coil, are also being explored. In contrast to electroconvulsive therapy, TMS can be performed in an office setting as it does not require anesthesia and does not induce a convulsion.

The Food and Drug Administration (FDA) has approved several transcranial magnetic stimulation (TMS) systems and devices (e.g., NeuroStar® TMS Therapy System (Neuronetics, Inc.), Brainsway Deep TMS System (Brainsway Ltd.), Magstim Rapid^2 Therapy System (Magstim Company Limited), MagVita TMS Therapy System (Tonica Elektronik A/S)).

For exclusions and training and other requirements for TMS, see **OTHER section** of this guideline.

Navigated Transcranial Magnetic Stimulation (nTMS)

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

Summary and Analysis of Evidence: The American Psychiatric Association published consensus recommendations on repetitive transcranial magnetic stimulation (rTMS) for the treatment of depression. The guidelines state, "Multiple randomized controlled trials and published literature have supported the safety and efficacy of rTMS antidepressant therapy." The recommendations include information on the following: clinical environment, operator requirements, documentation, coils, cortical targets, coil positioning methods, determination of motor threshold, number of treatment sessions for acute treatment, and allowable psychotropic medications during TMS treatment (McClintock et al 2018). For other conditions, the evidence is insufficient to determine that TMS results in an improvement in the net health outcome.

Maximal safe resection is the modern goal for surgery of intrinsic brain tumors located in or close to brain eloquent areas. Different neuroimaging techniques provide important anatomical and functional information regarding the brain functional organization that can be used to plan a customized surgical strategy to preserve functional networks, and to increase the extent of tumor resection. Among these techniques, navigated transcranial magnetic stimulation (nTMS) has recently gained great favor among the neurosurgical community for preoperative mapping and planning prior to brain tumor surgery. It represents an advanced neuroimaging technique based on the neurophysiological mapping of the functional cortical brain organization. Moreover, it can be combined with other neuroimaging techniques such as diffusion tensor imaging tractography, thus providing a reliable reconstruction of brain eloquent networks. Consequently, nTMS mapping may provide reliable noninvasive brain functional mapping, anticipating information that otherwise may be available to neurosurgeons only in the operating theater by using direct electrical stimulation. nTMS is a novel tool for the preoperative neurophysiological mapping of motor and language networks prior to surgery of intrinsic brain tumors located in or close to eloquent networks (Radda et al 2019). The evidence is insufficient to determine that nTMS results in an improvement in the net health outcome.

POSITION STATEMENT:

Initial Transcranial Magnetic Stimulation (TMS) Treatment

Transcranial magnetic stimulation (TMS) of the brain administered with an FDA approved device **meets the definition of medical necessity** as a treatment of major depressive disorder in individuals when **ALL** of the following criteria (1-3) have been met:

1. Confirmed diagnosis of severe major depressive disorder without psychosis with severity documented by one *clinically accepted depression rating scale (Table 1) that reliably measure depressive symptoms (e.g., Beck Depression Inventory (BDI), Inventory of Depressive Symptomatology Clinician-rated (IDS-C), Quick Inventory of Depressive Symptomatology Self-

reported (QIDS-SR), Montgomery-Asberg Depression Rating Scale (MADRS), Patient Health Questionnaire (PHQ9)). One test should be chosen and employed during the entire treatment course; **AND**

2. The member is between the age of 15 and 70 and is not actively abusing substances (urine drug screening (UDS) confirmation may be required) and has any one of the following (a, b, or c):

    a. Failure of 2 trials of psychopharmacologic agents approved by the FDA for treating major depressive disorder. The trials must include:

        • Medicine trials from at least two different antidepressant classes (e.g., SSRI, SNRI, TCA, MAI-O).

    b. Inability to tolerate a therapeutic dose of medications as evidenced by 2 trials of psychopharmacologic agents (consistent with the above criteria (2 a.above) with documented distinct intolerable side effects; **OR**

    c. TMS is judged by the provider to be less invasive treatment option to electroconvulsive (ECT) in the specific case or the member is not willing to consent to ECT;

3. Standardized depression rating scale (Table 1) should be performed during TMS treatment to monitor progress; at a minimal frequency of an initial pre-treatment test which is to occur prior to the 6 week initial treatment period, followed by testing every 2 weeks during the 6 week treatment period, followed by testing every 2 weeks during the 6 week treatment period and a final test at the last treatment visit. The scores will be required for concurrent authorization. If the rating scales document a lack of meaningful change or worsening of symptom intensity, review by a physician advisor may be indicated.

Abbreviations: SSRI= selective serotonin reuptake inhibitors; SNRI= serotonin and norinephrine reuptake inhibitors; TCA= tricyclic antidepressants; MAI-O= monoamine oxidase inhibitor.

Treatment

TMS **meets the definition of medical necessity** when 1 treatment session per day is given for 5 consecutive days per seeion for 6 consecutive weeks. Immediately following the 6 week treatment period, the treatment frequency is tapered, as follows:

- Week 1 (after 6-week initial treatment): 3 treatment sessions
- Week 2 (after 6-week initial treatment): 2 treament sessions
- Week 3 (after 6-week initial treatment): 1 treatment session

Retreatment Requests for Transcranial Magnetic Stimulation (TMS)

Retreatment request for transcranial magnetic stimulation (TMS) of the brain administered with an FDA approved device **meets the definition of medical necessity** when the following criteria (1 and 2) have been met:

1. Meets all requirements for initial TMS treatment (above)
2. Repeat acute treatment for relapse of depressive symptoms is considered medically necessary when both a and b are met:

a. There is documentation submitted that the member responded to prior treatments, specifically with a 50% or greater improvement in a standard rating scale for depressive symptoms (e.g., PHQ-9, BDI, MADRS, QIDS-SR or IDS-C score).

b. A minimum of 90 days has elapsed since the termination of the prior TMS treatment course.

   I. If member meets the above relapse criteria, a 5-day a week treatment course of left dorsolateral prefrontal cortex TMS treatment that lasts for six weeks (total of 30 sessions), followed by a three-week taper of three TMS treatment sessions in week 1, two TMS treatment sessions the next week, and one TMS treatment session in the third and final week. Treatment frequency of less than five days/week will be reviewed for medical necessity.

   II. If the member does not meet the criteria for 50% reduction in rating scale scoring, the request will not be considered medically necessary.

Table 1

Depression Rating Scale	Number Items	Minimum Score for Initial Authorization
Beck Depression Inventory (BDI)	21	>29
Inventory of Depressive Symptomatology Clinician-rated (IDS-C)	30	>36
Quick Inventory of Depressive Symptomology Self-reported (QIDS-SR)	16	>15
Montgomery-Asberg Depression Rating Scale (MADRS)	10	>34
Patient Health Questionnaire (PHQ9)	9	>19

For required documentation, refer to the **REIMBURSEMENT INFORMATION** section of this guideline.

For exclusions and training and other requirements for TMS, see **OTHER** section of this guideline.

Transcranial magnetic stimulation (TMS) of the brain is considered **experimental or investigational** as a treatment for **ALL** other indications, including but not limited to other psychiatric/neurologic disorders (e.g., bipolar disorder, schizophrenia, obsessive compulsive disorder (OCD), migraine headaches, stroke, epilepsy, memory (working)). The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Transcranial magnetic stimulation (TMS) (including high frequency deep transcranial magnetic stimulation (HF DTMS/HF dTMS)) utilizing the Brainsway device (helmet) as a treatment for obsessive compulsive disorder (OCD) and **ALL** other indications is considered **experimental or investigational**. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Navigated transcranial magnetic stimulation (nTMS) is considered **experimental or investigational** for all indications, including but not limited to brain mapping. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

BILLING/CODING INFORMATION:

CPT Coding:

90867	Therapeutic repetitive transcranial magnetic stimulation (TMS) treatment; initial, including cortical mapping, motor threshold determination, delivery and management
90868	Therapeutic repetitive transcranial magnetic stimulation (TMS) treatment; subsequent delivery and management, per session
90869	Therapeutic repetitive transcranial magnetic stimulation (TMS) treatment; subsequent motor threshold re-determination with delivery and management

If TMS is found to be medically necessary, authorization will be for 1 unit of 90867, 36 units of 90868, and 1 unit of 90869.

Requests for additional units of 90869 should be submitted with detailed clinical rationale.

Refer to section entitled **POSITION STATEMENT**.

REIMBURSEMENT INFORMATION:

The primary treating physician may be required to submit documentation for the member, which supports the criteria for TMS in the POSITION STATEMENT of this guideline.

Refer to section entitled **POSITION STATEMENT**.

LOINC Codes:

The following information may be required documentation to support medical necessity: physician history and physical, physician progress notes, plan of treatment and reason for transcranial magnetic stimulation (TMS).

Documentation Table	LOINC Codes	LOINC Time Frame Modifier Code	LOINC Time Frame Modifier Codes Narrative
Physician history and physical	28626-0	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Attending physician visit note	18733-6	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim.
Attending physician progress note	18741-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim.

Plan of treatment	18776-5	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim.
Laboratory studies	26436-6	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Current, discharge, or administered medications	34483-8	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim.

PROGRAM EXCEPTIONS:

Coverage for transcranial magnetic stimulation (TMS) referenced in this guideline performed and billed in an outpatient or office location will be handled through Lucet for select products. Lucet will determine coverage for these services for select products. Refer to member's contract benefits.

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage Products: No National Coverage Determination (NCD) was found at the time of the last guideline reviewed date. The following Local Coverage Determination (LCD) Transcranial Magnetic Stimulation for Major Depressive Disorder (L34522) is located at fcso.com.

If this Medical Coverage Guideline contains a step therapy requirement, in compliance with Florida law 627.42393, members or providers may request a step therapy protocol exemption to this requirement if based on medical necessity. The process for requesting a protocol exemption can be found at Coverage Protocol Exemption Request.

DEFINITIONS:

Major depression: a combination of symptoms (e.g., persistent sad, anxious, or “empty feelings, hopelessness or pessimism, difficulty concentrating, remembering details, and making decisions) that are disabling and prevents an individual from functioning normally.

RELATED GUIDELINES:

None applicable.

OTHER:

NOTE: The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

Other names used to report transcranial magnetic stimulation of the brain:

Brain stimulation therapy
Navigated transcranial magnetic stimulation (nTMS)
NeoPulse Transcranial Magnetic Stimulation

Exclusions:

1. The member has non-removable metallic objects or implants in his/her head or neck regions.
2. The member has an active neurologic disorder, including but not limited to (e.g., encephalopathy, dementia form any cause, Parkinson's Disease, post-stroke syndromes, increased intracranial pressure or bleeding, cerebral aneurysm, A-V malformations, CSF shunts, Implants in the CNS or head).
3. There is evidence of active psychotic symptoms.
4. Maintenance TMS treatment.
5. There is evidence that the member is actively abusing substances (Urine Drug Screen (UDS) confirmation may be required))
6. There is evidence of acute suicidal risk
7. There is evidence of catatonia
8. There is evidence of life-threating dysfunction in basic life needs
9. Intermittent Theta Burst Stimulation (ITBS)
10. Magnetic Seizure Therapy (MST).

Training and Other Requirements:

1. The attending physician is a board certified psychiatrist with training in the use of TMS in Major Depression.
2. The attending physician is required to perform first TMS treatment (code 90867 and 90869) (including cortical mapping, motor threshold determination, delivery, and management) and re-determination of the motor threshold (MT).
3. Subsequent TMS treatment may be administered by a psychiatrist.
4. A technician may perform TMS treatment (code 90868) (under direct supervision of the attending physician); the technician performing TMS treatment (code 90868) is required to have certification in performing TMS treatment (code 90868).
5. Lucet will register clinics or practitioners via documentation of certification, prior to determining coverage for TMS.

REFERENCES:

1. Al-Harbi KS. Treatment-resistant depression: therapeutic trends, challenges, and future directions. Patient Prefer Adherence 2012; 6: 369-388.
2. Allan CL, Herrmann LL, Ebmeier KP. Transcranial magnetic stimulation in the management of mood disorders. Neuropsychobiology 2011; 64(3):163-169.
3. Avery DH, Isenberg KE, Sampson SM et al. Transcranial magnetic stimulation in the acute treatment of major depressive disorder: clinical response in an open-label extension trial. Journal of Clinical Psychiatry 2008; 69(3): 441-451.

4. Bauer M, Bschor T, Pfennig A et al. World Federation of Societies of Biological Psychiatry (WFSBP) Guidelines for Biological Treatment of Unipolar Depressive Disorders in Primary Care. World Journal of Biological Psychiatry 2007; 8(2): 67-104.
5. Blue Cross Blue Shield Association Evidence Positioning System®. 2.01.90 Navigated Transcranial Magnetic Stimulation, 07/24 (Archived).
6. Blue Cross Blue Shield Association Evidence Positioning System®. 2.01.50 Transcranial Magnetic Stimulation as a Treatment of Depression and Other Psychiatric/Neurologic Disorders,11/24.
7. Brunoni AR, Chaimani A, Moffa AH, et al. Repetitive Transcranial Magnetic Stimulation for the Acute Treatment of Major Depressive Episodes: A Systematic Review With Network Meta-analysis. JAMA Psychiatry. 2017 Feb 1;74(2):143-152.
8. Carmi L, Alyagon U, Barnea-Ygael N et al. Clinical and electrophysiological outcomes of deep TMS over the medial prefrontal and anterior cingulate cortices in OCD patients. Brain Stimulation 2018 Jan-Feb; 11(1): 158-165.
9. Carmi L, Tendler A, Bystritsky A, et al. Efficacy and Safety of Deep Transcranial Magnetic Stimulation for Obsessive-Compulsive Disorder: A Prospective Multicenter Randomized Double-Blind Placebo-Controlled Trial. Am J Psychiatry. 2019 Nov 1;176(11):931-9.
10. Chang CH, Liou MF, Liu CY, et al. Efficacy of Repetitive Transcranial Magnetic Stimulation in Patients With Methamphetamine Use Disorder: A Systematic Review and Meta-Analysis of Double-Blind Randomized Controlled Trials. Front Psychiatry. 2022 May 27;13:904252.
11. Chen R, Spencer DC, Weston J et al. Transcranial magnetic stimulation for the treatment of epilepsy. Cochrane Database Systematic Reviews. 2016. Aug; (8): CD011025/
12. Dong K, Zhu X, Xiao W, et al. Comparative efficacy of transcranial magnetic stimulation on different targets in Parkinson's disease: A Bayesian network meta-analysis. Front Aging Neurosci. 2023 Jan 4;14:1073310.
13. Eranti S, Mogg A, Pluck G et al. A randomized controlled trial with 6-month follow-up repetitive transcranial magnetic stimulation and electroconvulsive therapy for severe depression. American Journal of Psychiatry 2007; 164(1): 73-81.
14. Feifel D, Pappas K. Treating Clinical Depression with Repetitive Deep Transcranial Magnetic Stimulation Using the Brainsway H1-coil. Journal of Visualized Experiments: JoVE 2016 Oct 4; (116): e53858.
15. Fitzgerald PB, Benitez J, de Castella A, Daskalakis ZJ, Brown TL, Kulkarni J. A randomized, controlled trial of sequential bilateral repetitive transcranial magnetic stimulation for treatment-resistant depression. Am J Psychiatry. 2006 Jan; 163(1): 88-94.
16. Fitzgerald PB, George MS, Pridmore S. The evidence is in: Repetitive transcranial magnetic stimulation is an effective, safe and well-tolerated treatment for patients with major depressive disorder. Aust N Z J Psychiatry. 2022 Jul;56(7):745-751. [Abstract]
17. Fochtmann LJ and Gelenberg AJ. Guideline Watch: Practice guideline for the treatment of patients with major depressive disorder, 2nd Edition. FOCUS: The Journal of Lifelong Learning in Psychiatry, Vol. 3, No. 1 Winter 2005:34-42.
18. Gaynes BN, Lux L, Lloyd S. et al. Nonpharmacologic interventions for treatment-resistant depression in adults. Comparative effectiveness Review No. 33. AHRQ Publication No. 11-EHC056-EF. Rockville, MD: Agency for Healthcare Research and Quality. Sept 2011.

19. Gelenberg AJ, freeman MP, Markowitz JC et al. Practice guideline for the treatment of patients with major depressive disorder, third edition, approved May 2010 and published Oct 2010.
20. George MS, Lisanby SH, Avery D, et al. Daily left prefrontal transcranial magnetic stimulation therapy for major depressive disorder: a sham-controlled randomized trial. Archives of General Psychiatry 2010; 67(5):507-516.
21. George MS, Post RM. Daily left prefrontal repetitive transcranial magnetic stimulation for acute treatment of medication-resistant depression. Treatment in Psychiatry 2011; 168(4): 356-364.
22. Gregory ST, Goodman WK, Kay B, et al. Cost-effectiveness analysis of deep transcranial magnetic stimulation relative to evidence-based strategies for treatment-refractory obsessive-compulsive disorder. J Psychiatr Res. 2022 Feb;146:50-54.
23. Harmelech T, Tendler A, Arikan MK, et al. Long-term outcomes of a course of deep TMS for treatment-resistant OCD. Brain Stimul. 2022 Jan-Feb;15(1):226-228.
24. Hawken ER, Dilkov D, Kaludiev E et al. Transcranial Magnetic Stimulation of the Supplementary Motor Area in the Treatment of Obsessive-Compulsive Disorder: A Multi-Site Study. International Journal of Molecular Science 2016 Mar 22; 17(3): 420.
25. Health Quality Ontario. Repetitive transcranial magnetic stimulation for treatment-resistant depression: a systematic review and meta-analysis of randomized controlled trials. Ontario Health Technology Assessment Services. 2016;16(5):1-66.
26. Institute for Clinical Systems Improvement (ICSI). Major depression in adults for mental health care. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2004 May. 52 p.
27. Janicak PG, Dunner DL, Aaronson ST et al. Transcranial magnetic stimulation (TMS) for major depression: a multisite, naturalistic, observational study of quality of life outcome measures in clinical practice. CNS Spectrum 2013; 18(6): 322-332.
28. Janicak PG, Nahas Z, Lisanby SH et al. Durability of clinical benefit with transcranial magnetic stimulation (TMS) in the treatment of pharmacoresistant major depression: assessment of relapse during a 6-month, multisite, open-label study. Brain Stimulation 2010; 3(4); 187-199.
29. Janicak PG, O'Reardon JP, Sampson SM et al. Transcranial magnetic stimulation in the treatment of major depressive disorder: a comprehensive summary of safety experience from acute exposure, extended exposure, and during reintroduction treatment. Journal of Clinical Psychiatry 2008; 69(2): 222-232.
30. Jeltema HR, Ohlerth AK, de Wit A, et al. Comparing navigated transcranial magnetic stimulation mapping and "gold standard" direct cortical stimulation mapping in neurosurgery: a systematic review. Neurosurg Rev. 2021 Aug;44(4):1903-1920.
31. Jiang X, Yan W, Wan R, et al. Effects of repetitive transcranial magnetic stimulation on neuropathic pain: A systematic review and meta-analysis. Neurosci Biobehav Rev. 2022 Jan;132:130-141. [Abstract]
32. Jorge RE, Moser DJ, Acion L et al. Treatment of vascular depression using repetitive transcranial magnetic stimulation Archives of General Psychiatry 2008; 65(3): 268-276.
33. Kennedy SH, Milev R, Giacobbe P et al. Canadian Network for Mood and Anxiety Treatments (CANMAT) Clinical guidelines for the management of major depressive disorder in adults. IV. Neurostimulation therapies. Journal of Affective Disorders 2009; 114: S44-S53.

34. Kobayashi M, Pascual-Leone A. Transcranial magnetic stimulation in neurology. Lancet Neurol. 2003; 2(3): 145-156.

35. Konstantinou G, Hui J, Ortiz A, et al. Repetitive transcranial magnetic stimulation (rTMS) in bipolar disorder: A systematic review. Bipolar Disord. 2022 Feb;24(1):10-26. [Abstract]

36. Lam RW, Chan P, Wilkins-Ho M et al. Repetitive transcranial magnetic stimulation for treatment-resistant depression: a systematic review and metaanalysis Canadian Journal of Psychiatry 2008; 53(9): 621-631.

37. Leung A, Shirvalkar P, Chen R, et al. Transcranial Magnetic Stimulation for Pain, Headache, and Comorbid Depression: INS-NANS Expert Consensus Panel Review and Recommendation. Neuromodulation. 2020 Apr;23(3):267-290 .[Abstract]

38. Liang K, Li H, Bu X, et al. Efficacy and tolerability of repetitive transcranial magnetic stimulation for the treatment of obsessive-compulsive disorder in adults: a systematic review and network meta-analysis. Transl Psychiatry. 2021 May 28;11(1):332.

39. Li H, Cui L, Li J, et al. Comparative efficacy and acceptability of neuromodulation procedures in the treatment of treatment-resistant depression: a network meta-analysis of randomized controlled trials. J Affect Disord. 2021 May 15;287:115-124.

40. Li R, He Y, Qin W, et al. Effects of Repetitive Transcranial Magnetic Stimulation on Motor Symptoms in Parkinson's Disease: A Meta-Analysis. Neurorehabil Neural Repair. 2022 Jul;36(7):395-404.

41. Lucet Medical Policy Transcranial Magnetic Stimulation for the Treatment of Major Depression, 01/25.

42. Martin JL, Barbanoj MJ, Schlaepfer TE et al. Repetitive transcranial magnetic stimulation for the treatment of depression. Systematic review and meta-analysis. British Journal of Psychiatry 2003; 182: 480-491.

43. Martin JLR, Barbanoj MJ, Pérez V, Sacristán M. Transcranial magnetic stimulation for the treatment of obsessive-compulsive disorder. The Cochrane Database of Systematic Reviews 2003, Issue 2. Art. No.: CD003387. DOI: 10.1002/14651858.CD003387.

44. Martin JLR, Barbanoj MJ, Schlaepfer TE, Clos S, Perez V, Kulisevsky J, Gironell, A. Transcranial magnetic stimulation for treating depression. The Cochrane Database of Systematic Reviews 2001, Issue 4. Art. No.: CD003493. DOI: 10.1002/14651858.CD003493.

45. McClintock SM, Reti IM, Carpenter LL, et al. Consensus Recommendations for the Clinical Application of Repetitive Transcranial Magnetic Stimulation (rTMS) in the Treatment of Depression. J Clin Psychiatry. 2018 Jan/Feb;79(1):16cs10905.

46. McGovern RA, Sheth SA. Role of the dorsal anterior cingulate cortex in obsessive-compulsive disorder: converging evidence from cognitive neuroscience and psychiatric neurosurgery. Journal of Neurosurgery 2017 Jan;126(1):132-147.

47. McLoughlin DM, Mogg A, Eranti S, Pluck G, Purvis R, Edwards D, Landau S, Brown R, Rabe-Heskith S, Howard R, Philpot M, Rothwell J, Romeo R, Knapp M. The clinical effectiveness and cost of repetitive transcranial magnetic stimulation versus electroconvulsive therapy in severe depression: a multicentre pragmatic randomised controlled trial and economic analysis. Health Technol Assess. 2007 Jul; 11(24): 1-54.

48. Minichino A, Bersani FS, Capra E et al. ECT, rTMS, and deep TMS in pharmacoresistant drug-free patients with unipolar depression: a comparative review. Neuropsychiatric Disease and Treatment 2012; 8:55-64.
49. Miyasaki JM, Shannon K, Voon V et al. Practice parameter: Evaluation and treatment of depression, psychosis and dementia in Parkinson disease (an evidence-based review). American Academy of Neurology 2006; 66 (7): 996-1002.
50. National Institute for Health and Clinical Excellence. Depression in adults: The treatment and management of depression in adults, Oct 2009.
51. National Institute for Health and Clinical Excellence. Transcranial magnetic stimulation for severe depression, Nov 2007.
52. National Institute for Health and Care Excellence (NICE). Transcranial magnetic stimulation for obsessive-compulsive disorder [IPG676]. 2020.
53. New England Comparative Effectiveness Public Advisory Council (CEPAC). Coverage Policy Analysis: Repetitive transcranial magnetic stimulation (rTMS). Completed by: the Institute for Clinical and Economic Review (ICER), June 2012.
54. O'Reardon JP, Solvason HB, Janicak PG et al. Efficacy and safety of transcranial magnetic stimulation in the acute treatment of major depression: a multisite randomized controlled trial. Biological Psychiatry 2007; 62(11): 1208-1216.
55. Perera MPN, Mallawaarachchi S, Miljevic A, et al. Repetitive Transcranial Magnetic Stimulation for Obsessive-Compulsive Disorder: A Meta-analysis of Randomized, Sham-Controlled Trials. Biol Psychiatry Cogn Neurosci Neuroimaging. 2021 Oct;6(10):947-960. [Abstract]
56. Qiao J, Ye QP, Wu ZM, et al. The Effect and Optimal Parameters of Repetitive Transcranial Magnetic Stimulation on Poststroke Dysphagia: A Meta-Analysis of Randomized Controlled Trials. Front Neurosci. 2022 Apr 28;16:845737.
57. Roth Y, Tendler A, Arikan MK, et al. A. Real-world efficacy of deep TMS for obsessive-compulsive disorder: Post-marketing data collected from twenty-two clinical sites. J Psychiatr Res. 2021 May;137:667-672.
58. Sachdev PS, Loo CK, Mitchell PB et al. Repetitive transcranial magnetic stimulation for the treatment of obsessive compulsive disorder: a double-blind controlled investigation Psychological Medicine 2007; 37(11): 1645-1649.
59. Saltychev M, Juhola J. Effectiveness of High-Frequency Repetitive Transcranial Magnetic Stimulation in Migraine: A Systematic Review and Meta-analysis. Am J Phys Med Rehabil. 2022 Nov 1;101(11):1001-1006. [Abstract]
60. Schramm S, Albers L, Ille S, et al. Navigated transcranial magnetic stimulation of the supplementary motor cortex disrupts fine motor skills in healthy adults. Sci Rep. 2019 Nov 28;9(1):17744.
61. Schutter DJ. Antidepressant efficacy of high-frequency transcranial magnetic stimulation over the left dorsolateral prefrontal cortex in double-blind sham-controlled designs: a meta-analysis Psychological Medicine 2009; 39(1): 65-75.
62. Sehatzadeh Sh, Tu HA, Palimaka S et al. Repetitive Transcranial Magnetic Stimulation for Treatment-Resistant Depression: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Ontario Health Technology Assessment Series. 2016 Mar 1;16(5):1-66.

63. Shivakumar V, Dinakaran D, Narayanaswamy JC et al. Noninvasive brain stimulation in obsessive-compulsive disorder. Indian J Psychiatry 2019; 61 (Suppl 1): S66-S76.

64. Su YC, Guo YH, Hsieh PC, et al. Efficacy of Repetitive Transcranial Magnetic Stimulation in Fibromyalgia: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. J Clin Med. 2021 Oct 12;10(20):4669.

65. Tikka SK, Siddiqui MA, Garg S, et al. Clinical Practice Guidelines for the Therapeutic Use of Repetitive Transcranial Magnetic Stimulation in Neuropsychiatric Disorders. Indian J Psychiatry. 2023 Feb;65(2):270-288.

66. Tranulis C, Sepehry AA, Galinowski A et al. Should we treat auditory hallucinations with repetitive transcranial magnetic stimulation? A metaanalysis Canadian Journal of Psychiatry 2008; 53(9): 577-586.

67. Trevizol A, Barros MD, Silva PO et al. Transcranial magnetic stimulation for posttraumatic stress disorder: an updated systematic review and meta-analysis. Trends Psychiatry Psychotherapy. 2016 Jan-Mar;38(1):50-55.

68. U.S. Food and Drug Administration. NeuroStar Advanced Therapy System K231926. February 23, 2024. Accessed March 6, 2025.

69. Voigt JD, Leuchter AF, Carpenter LL. Theta burst stimulation for the acute treatment of major depressive disorder: A systematic review and meta-analysis. Transl Psychiatry. 2021 May 28;11(1):330.

70. Yang YB, Chan P, Rayani K, et al. Comparative Effectiveness of Repetitive Transcranial Magnetic Stimulation in Unipolar and Bipolar Depression. Can J Psychiatry. 2021 Mar;66(3):313-315.

71. Zhu L, Zhang W, Zhu Y, et al. Cerebellar theta burst stimulation for the treatment of negative symptoms of schizophrenia: A multicenter, double-blind, randomized controlled trial. Psychiatry Res. 2021 Nov;305:114204.

COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 03/27/25.

GUIDELINE UPDATE INFORMATION:

06/15/02	New Medical Coverage Guideline.
06/15/03	Reviewed; no change in coverage.
06/15/04	Review and revision to guideline; consisting of updated references and various changes.
07/15/05	Review and revision of guideline; consisting of updated references.
06/15/06	Review and revision of guideline; consisting of updated references.
07/01/06	HCPCS coding update; consisting of the addition of 0160T and 0161T and the deletion of 0018T.
07/15/07	Review and revision of guideline; consisting of updated references and reformatted guideline.
04/15/08	Review and revision of guideline; consisting of updated references.
05/15/09	Updated description section. No change in position statement. Updated references.

01/01/11	Annual HCPCS coding update: deleted 0160T and 0161T. Added 90867 and 90868.
05/15/11	Scheduled review; no change in position statement. Updated references.
01/01/12	Annual HCPCS coding update; added 90869 and revised 90867 and 90868 code descriptor.
10/15/12	Added program exception for Medicare Advantage products; CPT code 90867, 90868 and 90869 is considered not medically reasonable and necessary; considered a non-covered service.
06/15/13	Scheduled review. Revised position statement; added "including repetitive TMS (rTMS) and "for all indications to TMS position statement. Revised experimental or investigational rationale, added "there is insufficient published evidence in the published peer-reviewed literature regarding the long-term effect of TMS on health outcomes". Added position statement for navigated transcranial magnetic stimulation (nTMS) (experimental or investigational). Updated description and references.
10/15/13	Updated program exception for Medicare Advantage products; added LCD title Transcranial Magnetic Stimulation for Major Depressive Disorder.
10/15/14	Scheduled review. Revised position statement; added indication and criteria for TMS. Added definition for major depression. Updated references.
11/15/14	Revised; treatment course, depression rating scale table, documentation, training and other requirements. Updated references.
09/15/15	Annual review; deleted "and/or BPAD depressed" from failure of trial of an evidenced based psychotherapy statement and updated references.
11/01/15	Revision: ICD-9 Codes deleted.
12/15/16	Annual review; no change to position statement. Updated description and references.
01/01/18	Annual review; revised position statement. Updated references.
12/15/18	Review; added position statement for all other indications including but not limited to other psychiatric/neurologic disorders. Updated references.
05/15/19	Review; added memory (working) to experimental or investigational position statement. Added TMS (including high frequency deep transcranial magnetic stimulation (HF DTMS/HF dTMS) utilizing the Brainsway device (helmet) for the treatment of obsessive compulsive disorder (OCD) and all other indications. Updated references.
01/01/20	Revision; deleted "repetitive TMS (rTMS)" from guideline. Added statement regarding FDA approved selected second generation antipsychotics. Updated references.
01/01/21	Review and revision. Added heading "Initial Transcranial Magnetic Stimulation (TMS) Treatment" to position statement. Deleted history of response to TMS in a previous depressive episode. Added retreatment request for TMS and criteria. Updated references.
01/01/23	Review and revision; revised and expanded criteria. Updated references.
05/22/23	Update to Program Exceptions section.
01/01/24	Review; revised position statement. Updated references.
02/15/25	Review; revised position statement. Updated references.
04/15/25	Review and revision. Changed age from 18 to 15 and adult to individual. Updated references.