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What is TMS?

- Transcranial Magnetic Stimulation (TMS) is an evidence based, non-invasive procedure that is used in the treatment of treatment-resistant depression. Through the use of a Brainsway helmet, pulsating magnetic fields are used to stimulate nerve cells in the brain to improve symptoms of depression. The use of TMS for treatment of depression has been found to be not only highly effective in reducing symptoms, but also cost effective for patients.

How does TMS work?

- TMS uses a magnetic field to stimulate a specific target region in the brain that controls mood, using it to treat symptoms of Major Depressive Disorder (MDD), by activating the neural pathways.

What are the typical eligibility requirements for treatment and insurance coverage?

- To be eligible for TMS treatment patients must have a diagnosis of Major Depressive Disorder (MDD - recurrent, severe; F33.2) and be referred to treatment by their primary psychiatrist. Patients must be 18 years of age or older. Patient must also must have tried and failed to see results from four medications from two different classes without improvement, along with medication augmentation trials, and a sufficient trial of evidence-based psychotherapy.

Who is not eligible to receive TMS?

- Patients with any type of non-removable metal in their heads (braces and dental fillings are acceptable) should not receive TMS. This includes aneurysm clips or coils, stents in the neck or brain, deep brain stimulators, electrodes to monitor brain activity, metallic implants in the ears or eyes, shrapnel or bullet fragments in or near the head, facial tattoos with magnetic or magnetic-sensitive ink, and other metal devices or objects implanted in or near the head.
- Patients with a history of seizures or a current seizure disorder should not receive TMS treatment.
- Patients who have a history of mania or psychosis should not receive TMS treatment.
- Patients who are pregnant should not receive TMS treatment.

Is TMS safe?

- Yes, TMS is considered to be a safe alternative treatment for depression. It is FDA approved and has minimal risks and side effects compared to other methods of treatment, such as ECT and some medication trials[1].

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Can TMS be used to treat anything other than MDD?

- TMS was FDA approved as a treatment for MDD in 2008, and as a treatment for pain associated with certain migraine headaches in 2013. In 2018, TMS was approved as a treatment for OCD. Our clinic currently provides treatment for MDD only.

What should I expect during a TMS treatment?

- Because TMS uses magnetic pulses, before beginning a treatment, patients are asked to remove any magnetic-sensitive objects (such as jewelry, credit cards). Patients are required to wear earplugs during treatment for their comfort and hearing protection, as TMS produces a loud clicking sound with each pulse, much like an MRI machine. Patients are seated during each session of TMS.
- During the first TMS session, several measurements are made to ensure that the TMS coil will be properly positioned over the patient's head. Once this is done, the TMS coil is suspended over the patient's scalp. The TMS physician then measures the patient's motor threshold, by administering several brief pulses. The motor threshold is 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. Motor threshold is not checked at every treatment but will be reassessed multiple times during the course of treatment or if there is concern it may have changed, for example, because of a change in medication.
- Once the motor threshold is determined, the coil is then brought forward so that it rests above the front region of the patient's brain. The coil is inside a helmet, which will be securely strapped to the patient's head. Treatment is then started. During the treatment, patients will hear a series of clicking sounds and will feel a tapping sensation under the treatment coil. The treatment itself last about 20 minutes, after which the helmet is removed by the TMS operator and the patient leaves the clinic and may safely resume their daily activities.

How long does it take to feel results?

- Results are experienced differently in each patient. Some patients will feel results more quickly than others, but if it takes longer to notice symptom relief compared to other patients, this does not mean that the treatment is ineffective.

Does TMS work for everyone?

- Existing evidence to date suggests that patients who are less treatment-resistant respond better to TMS than those who are highly treatment-resistant. However, there is much yet to be learned about particular variables that may impact response to TMS[1].

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How effective is TMS?

- In the multicenter clinical trial that led to FDA clearance 1 in 3 patients achieved full remission from their depression and 38.4% had their depressive symptoms reduced by 50% after 20 treatments.
- In real life clinical settings 1 in 2 patients reach full remission from their depression, and 3 in 4 patients have their depressive symptoms reduced by 50%.

How long does remission last and will I need retreatment?

- Remission lengths and the need for retreatment vary by patient. You are encouraged to continue to meet with your primary psychiatrist after TMS treatment is completed and discuss the need for retreatment if your depressive symptoms return.
- Among people who responded to TMS initially, 66.5% has a sustained response after 3 months, 52.9% had a sustained response after 6 months, and 46.3% had a sustained response after 12 months[2].

What are the potential risks and side effects of TMS?

- TMS is well-tolerated and associated with few side effects and only a small percentage of patients discontinue treatment because of these. The most common side effects are headache and fatigue. These are mild and generally diminish over the course of the treatment.
- Some patients may experience intense scalp sensations or facial twitching during TMS treatment sessions. These generally diminish over the course of treatment, and adjustments can be made to the position of the coil to reduce discomfort.
- TMS has not been associated with many of the side effects caused by antidepressant medications, such as gastrointestinal upset, dry mouth, sexual dysfunction, weight gain, or sedation.
- The most serious risk of TMS is seizures. However, the risk of a seizure is exceedingly low at less than 0.1%. At PrairieCare Edina's Center for Neurotherapeutics, we follow up-to-date safety guidelines that are designed to minimize the risk of seizures[3].
- While TMS is a safe procedure, it is important to point out that because it is a new treatment, there may be unforeseeable risks that are not currently recognized[1].

Can I take antidepressants if I am receiving TMS treatment?

- Yes, your TMS doctor may advise you to continue taking your antidepressant medication while receiving TMS therapy.

Can I drink alcohol if I am receiving TMS treatment?

- No, patients receiving TMS treatment must abstain from alcohol use for the entire length of their treatment and stop drinking alcohol at least 5 days prior to starting treatment. This also includes things such as Kombucha and NyQuil, due to the potential for them to contain a small volume of alcohol. Alcohol consumption increases the risk of seizure in patients receiving TMS treatment.

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What are the long-term consequences of TMS treatment?

- There have been no observed long-term side effects associated with TMS. While TMS is widely considered to be safe, it is important to point out that because it is a new treatment, it is still under investigation.

Will treatment be covered by insurance?

- TMS treatment is covered by most insurance companies. Please contact your insurance provider to see if TMS is covered by your plan.

Does TMS hurt?

- Everyone experiences the treatment sensation differently. TMS feels like tapping on the skull. Many compare it to a woodpecker tapping a small area repeatedly. While treatment may be mildly uncomfortable during the first week or so, many people get used to the sensation and do not experience pain. Your treatment team will work with you to ensure that your treatment is tolerable and as comfortable as possible.

Can I get off medications after TMS treatment?

- Your TMS doctor may advise you to continue taking your antidepressant medication while receiving TMS therapy.
- After treatment, you and your primary doctor can discuss your medication and take an appropriate course of action.

Is TMS like ECT?

- No, they are not alike. TMS is an outpatient procedure and uses magnetic fields, similar to an MRI. There are few minor side effects. TMS does not induce seizures.
- ECT is a much more intensive and invasive treatment and typically requires hospitalization; the patient is under anesthesia, and current is used to induce seizures.

What is the difference between TMS and antidepressant medications?

- Antidepressants are systemic, meaning that the medicine enters the body and blood stream; TMS is non-systemic.
- TMS is a drug free, FDA approved process for treating depression.
- Antidepressants, as many drugs do, have numerous side effects such as insomnia, blurred vision, dry mouth, fatigue, weight gain, nausea, GI distress, diarrhea, sedation, lack of emotion, and sexual dysfunction.
- TMS side effects include mild pain or discomfort in the form of fatigue and headaches.
- TMS is usually prescribed when antidepressants fail, or the side effects are intolerable.

Do I need to be hospitalized for a session of TMS therapy?

- No. Unlike ECT, TMS does not require any sedation or general anesthesia, so patients are fully awake and aware during the treatment. There is no “recovery time,” so patients can drive home afterwards and return to their usual activities.

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Does TMS treatment cause brain tumors?

- No, TMS Therapy uses the same type and strength of magnetic fields as MRIs (magnetic resonance imaging), which have been used for tens of millions of patients around the world and have not been shown to cause tumors. The magnetic energy used in a full course of TMS Therapy is a small fraction of just one brain scan with an MRI.

Am I able to work while receiving TMS?

- There is no "recovery time" after treatments, so patients can drive home afterwards and return to their usual activities. If you are employed and would like to work during your TMS treatment course, you may work with our TMS Coordinator to find a suitable treatment schedule to allow you to do so.

Will I have a seizure if I have TMS?

- The most serious risk of TMS is a seizure. However, the risk of a seizure during TMS treatment is exceedingly low[3]. At PrarieCare Edina's Center for Neurotherapeutics, we follow up-to-date safety guidelines that are designed to minimize the risk of seizures. Our TMS team takes many precautions to ensure our patients are safe and comfortable.

How long does TMS take?

- A typical course of TMS treatment consists of 30-37 Treatments over 8-12 weeks, as recommended by your TMS doctor, or as covered by your insurance.
- A treatment session lasts 20 minutes.
- Please see our TMS Roadmap for further information on what a typical treatment course may look like.

Can I see my current therapist while I am receiving TMS treatment?

- Yes! We encourage you to see your therapist and care providers during treatment.

Can I see my primary psychiatrist while I am receiving TMS treatment?

- Your TMS doctor will be primarily responsible for your medication management during your TMS treatment. They will work alongside your primary psychiatrist as needed.

How do I start TMS treatment with The Center for Neurotherapeutics?

- The completion of a phone screen and TMS Doctor Referral Form are required to schedule a TMS consultation. If you have questions regarding TMS or would like to start the intake process, please contact our TMS Care Coordinator at 952.737.4510 or at CFN@prairie-care.com.

1. McClintock, S. M., Reti, I. M., Carpenter, L. L., McDonald, W. M., Dubin, M., Taylor, S. F., ... & Krystal, A. D. (2018). Consensus recommendations for the clinical application of repetitive transcranial magnetic stimulation (rTMS) in the treatment of depression. *The Journal of clinical psychiatry*, *79*(1).
2. Senova, S., Cotovio, G., Pascual-Leone, A., & Oliveira-Maia, A. J. (2019). Durability of antidepressant response to repetitive transcranial magnetic stimulation: Systematic review and meta-analysis. *Brain stimulation*, *12*(1), 119-128.
3. Dobek, C. E., Blumberger, D. M., Downar, J., Daskalakis, Z. J., & Vila-Rodriguez, F. (2015). Risk of seizures in transcranial magnetic stimulation: a clinical review to inform consent process focused on bupropion. *Neuropsychiatric disease and treatment*, *11*, 2975.