

# Transcranial magnetic stimulation (tms) for depression



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## Abstract

**Clinical Problem:** Patients diagnosed with Major Depressive Disorder (MDD) may not be responsive to medication therapy (MT) or may not want to take medications but still require treatment.

**Objective:** To determine if Transcranial Magnetic Stimulation (TMS) at a high or low frequency is more effective than antidepressant MT or no medications as an intervention for individuals who have been diagnosed with MDD. The search engine used to find relevant literature on the use of TMS for the treatment of MDD was Pub Med through the University of South Florida's Health Shimborg Library website. The key terms used to search for randomized control trials and guidelines were major depressive disorder, transcranial magnetic stimulation, treatment, intervention and guidelines.

**Results:** The guideline by the Food and Drug Administration (FDA) approved TMS as a form of treatment for individuals who have been diagnosed with MDD and have not been responsive to prior antidepressant MT (Perera et al., 2016). The randomized control trials (RCT) demonstrated a decrease in signs and symptoms and an increase in quality of life (QOL).

**Conclusion:** Patients who receive TMS daily for four to six weeks demonstrated a decrease in signs and symptoms and an increase in QOL.

Depression Treatment

According to Solvason et al. (2014), MDD is a common disorder that affects many individuals across the global. Depression can affect every aspect of a person's life negatively if it not controlled. For example, individuals may not want eat or get out of bed, may abuse substance or be unable to maintain employment. It can also affect social interactions with family and friends. There are several combinations of antidepressant MT that could be used for treatment. With some patients, it may not be effective due to various reasons i. e. severity of disorder. According to Jin & Phillips (2014), TMS is electromagnetic stimulation of the prefrontal cortex that can be used as treatment for MDD. Can TMS be a viable option for patients instead of antidepressant medications to decrease depression symptoms and increase QOL? In adults, does the use high or low frequency Transcranial Magnetic Stimulation (TMS), compared to antidepressants or no MT, decrease signs and symptoms of depression after four weeks to six weeks of treatment?

### Literature Search

The search engine used to find relevant literature on the use of TMS for the treatment of MDD was Pub Med through the University of South Florida's Health Shimborg Library website. The key terms used to search for randomized control trails and guidelines were major depressive disorder, transcranial magnetic stimulation, treatment, intervention and guidelines.

### Literature Review

Three randomized control trials and one guideline were used to evaluate the effectiveness of TMS for the treatment of MDD. The RCT, sham controlled (SC), double blind (DB) study conducted by Jin & Phillips (2014) was used to <https://assignbuster.com/transcranial-magnetic-stimulation-tms-for-depression/>

test the efficiency of TMS at a lower frequency on the subject's individual's frequency (synchronized TMS or sTMS). Forty-six of the original fifty-two subjects who were initially enrolled are being included in the final analysis. All of the participants have been clinically diagnosed with MDD. The patients were all over the age of 18 and were required to meet a score equal to or greater than 17 on the Hamilton Depression rate scale in order to be a participant in this study. The patients were randomized into three groups which consisted of: fixed frequency, varied frequency between 8Hz and 13 Hz and the sham control group. The subjects received treatment five days each week for four weeks and continued to received their current antidepressant medications throughout the study. Strengths in this study included RCT model, inclusion and exclusion criteria for the subjects, and an explanation of the randomization. The primary weakness of this study was that it lasted for four weeks and no long term clinical data was obtained. The study found that in contrast to the sham group, regardless if the subject received fixed or random frequency, there was a considerable reduction in severity of depression (19.3% vs. 48.5%, respectively;  $p = 0.001$ ).

According to Solvason et al. (2014), the purpose of this study was to test the quality of life (QOL) for subjects who received TMS treatment. This was a RCT, SC, and DB treatment study for the first six weeks. The sample size was 301 subjects with 155 subjects receiving active treatment and while the remaining 146 were in the SC group. If subjects were not responsive to the initial treatment regardless if they were in the SC group, they were enrolled in a six-week open study without unblinding their prior assignments. At the end of the treatment all patients were tapered off of TMS over a three-week

time period and given maintenance antidepressants. Strengths include randomization of patients into control and intervention groups, patient criteria were specific and requirements were met across the board, the follow up assessments were conducted long enough to obtain results on the efficiency of the intervention. All QOL assessments pre-and post-treatment used Medical Outcomes Study-36 Item Short Form (SF-36) and the Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) as the measurement tool. The authors reported that after six weeks of treatment and the twenty-four week follow up QOL increased for these subjects.

Speer et al. (2014) created a study to test the effectiveness of high and low frequency of TMS. This was a RCT, sham controlled, and double blind treatment study. Twenty-four adults diagnosed with depression were randomly and evenly placed into three groups which consisted of: 1Hz, 20 Hz and the sham control group. The subjects allowed to participate in the study, each have failed at least two previous antidepressant combinations but not electroconvulsive therapy (ECT). Strengths in this study included RCT model, inclusion and exclusion criteria for the subjects, all subjects completed the entire study. A weakness in the study was that it lasted for seven weeks, no long term clinical data was obtained to test the interventions longevity, and small sample size. Patients on the high, 20 Hz and low 1 Hz frequency showed great improvement when compared to the sham group ( $p= 0.024$  and  $p= 0.045$ , respectively). The baseline mean for Hamilton Depression ratings were higher ( $p> 0.03$ ) for those randomized to 20 Hz ( $35.8 \pm 10.6$ ), but not to 1 Hz ( $28.6 \pm 7.6$ ) compared to sham ( $24.0 \pm 4.6$ ).

According to Perera et al. (2016), the guideline by the Food and Drug Administration (FDA) approved TMS as a form of treatment for individuals have been diagnosed with MDD and have not been responsive to prior antidepressant MT. It is recommended that TMS treatment is completed every day for four to six weeks in order for treatment to be effective.

### Synthesis

Jin & Phillips (2014) demonstrated that overall there was a significant decrease in depression symptoms in the patient diagnosed with MDD ( $p = 0.001$ ). Additionally, Solvason et al. (2014), demonstrated an increase in QOL in subjects with previous failed medication therapies ( $p < 0.001$ ). Speer et al. (2014) also conveyed a decrease in depression symptoms regardless if high frequency, 20 Hz or low frequency, 1Hz were used as a form of treatment ( $p = 0.024$  and  $p = 0.045$  respectively). According to Perera et al. (2016), the current guideline written by the FDA approves TMS use for individuals with pharmacoresistant MDD. The research demonstrates that the use of TMS as a form of treat for MDD can be effective. Despite the research proving that it can be effective, research should be conducted to explain factors that could prevent TMS from being effective on all patients.

### Clinical Recommendations

The approaches used in these studies showed various ways that TMS can be used as a form of treatment for a person who is diagnosed with MDD. In most subjects, the initial four to six weeks of treatment was successful but some may need an additional four to six weeks in order to decrease

symptoms. The expected outcomes would be to continue research on <https://assignbuster.com/transcranial-magnetic-stimulation-tms-for-depression/>

various ways that TMS can be used to treat patient with MDD and what other factors would determine the success of treatment for example: if the subject used some form of maladaptive coping mechanism prior to treatment with TMS does that affect the outcome of treatment. Research confirms that individuals who have failed at least two previous antidepressant medication therapies can be treated with TMS to decrease depression symptoms and improve quality of life.

## References

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