

demonstrating remission rates up to 30%, but aTMS had remission rates up to 90.5%. aTMS can also be used for suicidality, patients with severe or refractory depression, as well as those with comorbid anxiety, which have historically shown lower rates of success with other treatments. Overall, all forms of TMS produce minimal and temporary side effects with patients being able to return to normal activities the same day as treatment, although aTMS may cause side effects of greater intensity resulting in sleep dysregulation. Cost remains a barrier, with many insurances covering rTMS but not iTBS or aTMS.

**Conclusion.** TMS is an evidence based, efficacious, and safe treatment for depression. Most FDA-approved TMS protocols for depression have similar number of sessions, duration of treatment, common side effects, and remission rates, besides aTMS, which has dramatically greater remission rates and shorter treatment duration, making it a potentially rapid and effective treatment modality for acute and more severe cases of depression.

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## Repetitive Transcranial Magnetic Stimulation (rTMS) versus Transcranial Direct Current Stimulation (tDCS) for Depression: a review

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**Introduction.** The World Health Organization estimates depression affects 5% of the adult population and is the leading cause of disability and the 3rd cause of disease burden worldwide. Despite progress in therapies and pharmacology, 30% of patients have refractory symptoms. Patients with partial response and patients who do not want or are intolerant to medication can benefit from alternative treatment modalities such as repetitive transcranial magnetic stimulation (rTMS) and transcranial direct current stimulation (tDCS). However, there is scant literature comparing these two neuromodulatory techniques. The authors provide an overview of rTMS and tDCS to guide clinicians.

**Methods.** A review of MEDLINE, Google Scholar, and EBSCO-Host databases was conducted. Keywords used included "rTMS," "tDCS," and "depression." All types of articles discussing or comparing the modalities were selected. The unique characteristics, indications, and side effects of rTMS and tDCS were included.

**Results.** rTMS is a neurostimulator used in-clinic that induces depolarization and neuronal activity in the dorsolateral prefrontal cortex, where hypofunction has historically been associated with depressive symptoms. The treatment is Food and Drug Administration (FDA) approved, and the most common protocol consists of 36 sessions over 8-9 weeks. Side effects are mild and temporary, and patients can resume daily activities after sessions.

Its absolute contraindications are limited to metallic objects or implanted stimulator devices in or near the head. The total cost varies from \$6,000-\$11,000 but is covered by most insurance.

In contrast, tDCS is a cost-effective, small, and portable neuromodulator self-administered by patients at home that either increases or decreases intrinsic neural firing in the primary motor cortex and dorsolateral prefrontal cortex. Multi-session tDCS is thought to promote or regulate information processing efficiency. The most common protocol uses a constant low current for 20-30 minutes applied daily for 10 to 15 days. Common side effects are mild and temporary, and there is no absolute contraindication. Some meta-analyses have found its efficacy comparable to rTMS or antidepressants. However, due to uncertainties about the specific mode of administration, number of treatments, and duration of effect, its status remains investigational by the FDA.

**Conclusions.** The efficacy and safety of rTMS for the treatment of depression have been demonstrated in numerous studies. However, the lack of adequately equipped clinics and large cost limits its availability in spite of FDA approval. In contrast, tDCS has some advantages, including safety, tolerability, ease of administration at home, and cost-effectiveness, but requires further research and more rigorous evidence.

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## Impact of Progressive Muscle Relaxation on Psychological Symptoms on an Inpatient Psychiatric Unit

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**Objectives.** To examine the effectiveness of short-term progressive muscle relaxation therapy in reducing symptoms of depression, anxiety, and aggression/agitation, in patients on an inpatient psychiatric unit. Additionally, to determine the impact of clinical and sociodemographic factors on its effectiveness.

**Methods.** Psychiatric inpatients at a private, community-based psychiatric hospital were invited to participate in a progressive muscle relaxation activity and filled out pre- and post-activity surveys querying symptoms of depression, anxiety, and aggression/agitation, using a created Likert scale.

**Results.** The 57 participants in this study showed an average decrease in every symptom domain, including -0.93 in agitation/aggressive symptoms ( $p < 0.001$ ), -2.14 in depressive symptoms ( $p < 0.001$ ), and -1.81 in anxiety symptoms ( $p < 0.001$ ). While diagnosis did not appear to be significantly related to change in score, patients with different primary diagnoses had changes in different symptom domains, with patients with Bipolar Disorder