

Novel brain stimulation technique shows promise in patients with hard-to-treat depression

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Dr. Charles Weber demonstrates transcranial magnetic stimulation (TMS) treatment at Family Care Center's Lowry Clinic in Denver. Credit: Family Care Center

By making slight modifications to an already approved brain stimulation technique called transcranial magnetic stimulation (TMS), researchers have reported profound improvement in patients with hard-to-treat depression.

Overall, 66% of patients with [major depressive disorder](#) who took part in the study responded to the novel treatment, and 42% showed acute remission. This is significantly higher than the 29% response rate reported for the standard FDA-approved protocol and also better than the response rates reported for alternative evidence-based protocols.

"The findings are significant, particularly for patients who have tried other treatments and not seen desired results," said Sabrina Segal, Ph.D., Director of Research at Family Care Center, who led the study, which was recently published in the journal [Brain Stimulation](#).

She added, "Our TMS protocol reduced patient symptoms considerably more than other approaches and with virtually no [side effects](#)."

Only [30–50%](#) of patients experience full recovery or remission when treated with psychotherapy or medication. Even when medications do work, they can sometimes cause side effects ranging from [weight gain](#) to [sexual dysfunction](#), and in some cases, can actually make depression symptoms worse.

Patients who try several types of therapy unsuccessfully are often considered treatment-resistant, especially those who suffer from major depressive disorder, a problem so pervasive that it's considered the leading cause of disability worldwide, according to the [World Health Organization](#).

"This is a global epidemic," said Dr. Segal. "Simply put, we need more effective treatment options, and that's where TMS can make an impact."

During the trial, more than three dozen patients underwent TMS to a region in the front left portion of the brain. It's a technique that's already approved by the FDA for the treatment of major depressive disorder; however, it has only been shown to offer a meaningful reduction in depression symptoms in about 29% of patients.

"We took that approach a step further," said Charles L. Weber, DO, FASAM, Chief Medical Officer and Founder of Family Care Center. "What we did was follow up the more traditional [stimulation](#) of 15 minutes to the left side of the brain, with three minutes of high frequency, short bursts of stimulation to an area in the right side of the brain."

He added, "This type of stimulation to the right side has been associated with improvements in symptoms related to anxiety and post-traumatic stress disorder (PTSD). A couple of recent studies have demonstrated a reduction in [depressive symptoms](#) in [older adults](#); however, this is the first study to show the effectiveness of the right-side stimulation on reduction of depressive symptoms in younger adults."

The fact that two out of three patients showed a response to this approach and nearly half had acute remission is made more encouraging by the fact that most patients in this study suffered from other conditions as well, such as anxiety and PTSD.

"There is much more research needed in those areas, but given our initial success, we're optimistic about the potential, particularly given their demographics," said Dr. Segal.

The study consisted of patients whose mean age was 42.5 years, more than 20 years younger than recent similar studies that used TMS to evaluate the impact on patients with so-called late-life depression.

Developing new therapies for younger patients could help them find effective treatments much earlier in life, significantly reduce lost productivity and the cost of failed therapies, and could potentially become an option for younger veterans, in particular, millions of whom struggle to find effective therapies to treat PTSD.

Before the study began, each patient charted their symptoms using a standard scale, with zero being no symptoms and 27 representing the most severe. At the outset, [patients](#) had a mean score of 18.18. During the course of the trial, symptoms improved to a mean score of 10.29, and by the end of the study, they had been cut by more than half at just over 8, with many achieving acute remission.

"We are making huge strides in understanding how TMS works, but we're still just scratching the surface," said Dr. Segal. "Hopefully, this could someday become a first-line therapy for millions who suffer from a variety of mental illnesses and spare them the devastating toll they often take on their lives."

More information: Sabrina K. Segal et al, Letter to the editor: A novel sequential bilateral neurostimulation approach for treatment-resistant depression involving high-frequency repetitive transcranial magnetic stimulation to the left dorsolateral prefrontal cortex and intermittent theta burst to the right dorsolateral prefrontal cortex, *Brain Stimulation* (2023). [DOI: 10.1016/j.brs.2023.11.007](https://doi.org/10.1016/j.brs.2023.11.007)

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