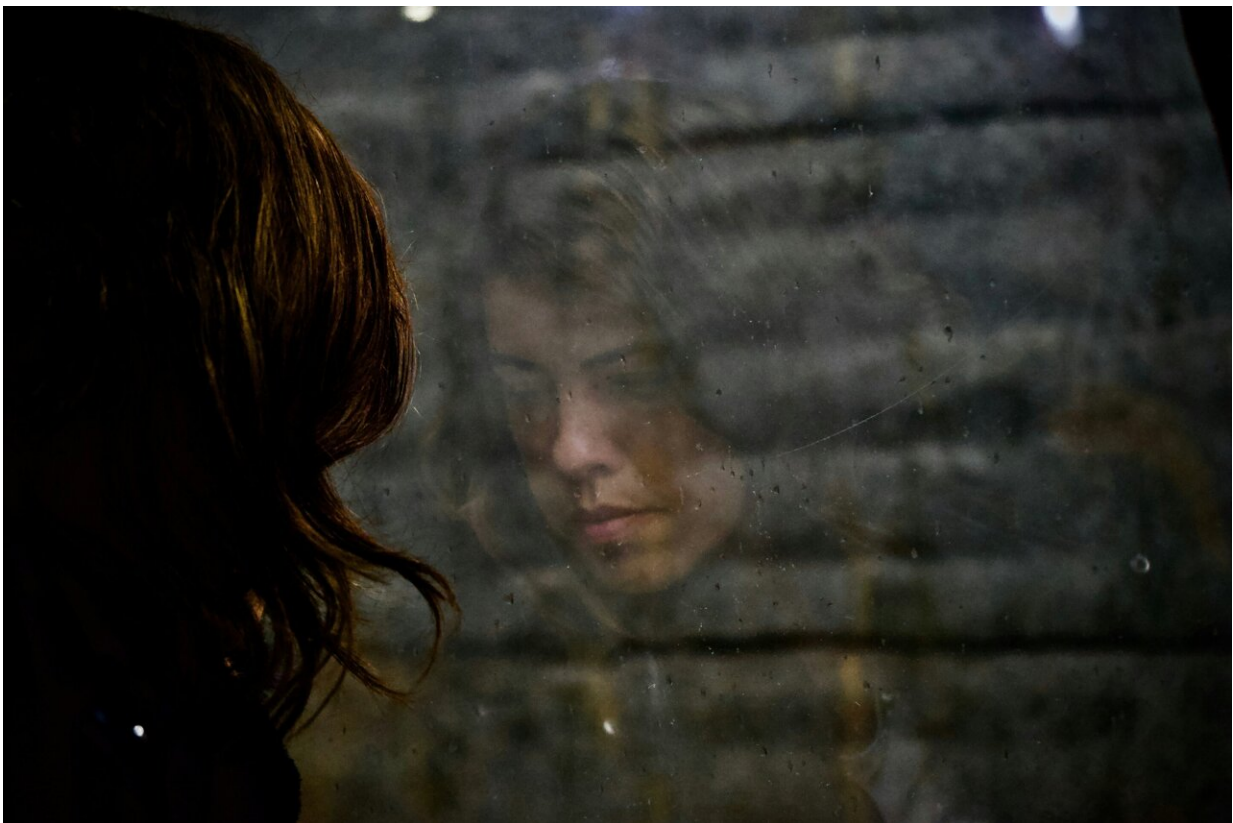


Some forms of augmented brain stimulation recommended for major depression

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According to a review [published](#) in *Harvard Review of Psychiatry*, certain combinations of medication or psychotherapy in conjunction with transcranial magnetic stimulation (TMS) or transcranial direct current stimulation (tDCS) are supported by clinical studies for treatment of major depressive disorder (MDD). The authors do caution that, overall, the research has important limitations.

TMS was approved by the Food and Drug Administration for [treatment](#) of MDD in 2008. It uses pulsed magnetic fields to induce an electric current in the left dorsolateral prefrontal cortex (dlPFC). tDCS conducts weaker electrical currents to the dlPFC via electrodes placed on the scalp. While not yet FDA-approved, tDCS is quite promising, especially since the equipment is portable and therefore more accessible.

Co-senior authors Tina Chou, Ph.D., and Darin Dougherty, MD, Director of Research and Director of the Division of Neurotherapeutics at Massachusetts General Hospital in Boston, and colleagues reviewed medical literature on whether combining TMS or tDCS with traditional MDD treatment can lead to greater symptom reduction. They searched PubMed, PsycInfo, and Cochrane Library through December 5, 2023, reviewing 58 studies that incorporated outcome measures for MDD.

The reviewers found support for several augmented strategies:

- Pairing [mindfulness-based stress reduction](#) with TMS can be more effective for MDD than mindfulness training or general psychological care alone. However, mindfulness interventions should not occur during a TMS session.
- The combination of standard (not shortened or adapted) mindfulness-based [cognitive behavioral therapy](#) and tDCS can reduce MDD symptoms more than the combination of general

relaxation exercises and tDCS.

- Adding TMS or tDCS to a stable dose of pharmacotherapy can decrease MDD symptoms; however, benzodiazepines may interfere with treatment response, and antipsychotics may interfere with response to TMS. (There are no studies on combining antipsychotics and tDCS.)
- When adding TMS to an ongoing medication regimen, clinicians should consider a phased approach, starting with 1 or 2 Hz (which has fewer side effects and may be more tolerable than higher frequencies) and progressing to 10 Hz if necessary.
- Starting citalopram at 20–40 mg/day along with TMS can accelerate symptom reduction one to two weeks into treatment, a reduction that can be maintained through the end of treatment.
- Combining sertraline 50 mg/day with 30-minute sessions of tDCS can significantly reduce MDD symptoms, especially for patients with more severe MDD.

Drs. Chou, Dougherty, and co-authors discuss notable limitations of the papers they reviewed:

- The majority of studies had small sample sizes, even as few as four or five participants.
- Most larger studies lacked a [control group](#) or were open-label, naturalistic, or retrospective.
- Few TMS studies were comparable because they used different stimulation protocols.
- Most studies were short-term.

"Open-label trials are useful during initial, exploratory phases, or if it is not feasible to blind participants to treatments," the authors note. "In these particular studies, however, the degree to which they are used is peculiar considering the literature on neuromodulation augmentation spans nearly 20 years."

Drs. Chou and Dougherty's group continues, "Given the potential side effects of adding medications, and the effort and time required to engage in psychotherapy, such additional interventions need to confer benefits beyond what TMS or tDCS offers alone. Crucially, randomized controlled trials are necessary to move the field forward."

More information: Brian Kochanowski et al, A Review of Transcranial Magnetic Stimulation and Transcranial Direct Current Stimulation Combined with Medication and Psychotherapy for Depression, *Harvard Review of Psychiatry* (2024). [DOI: 10.1097/HRP.0000000000000396](https://doi.org/10.1097/HRP.0000000000000396)

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