Neuromodulation advances offer promise for treating depression

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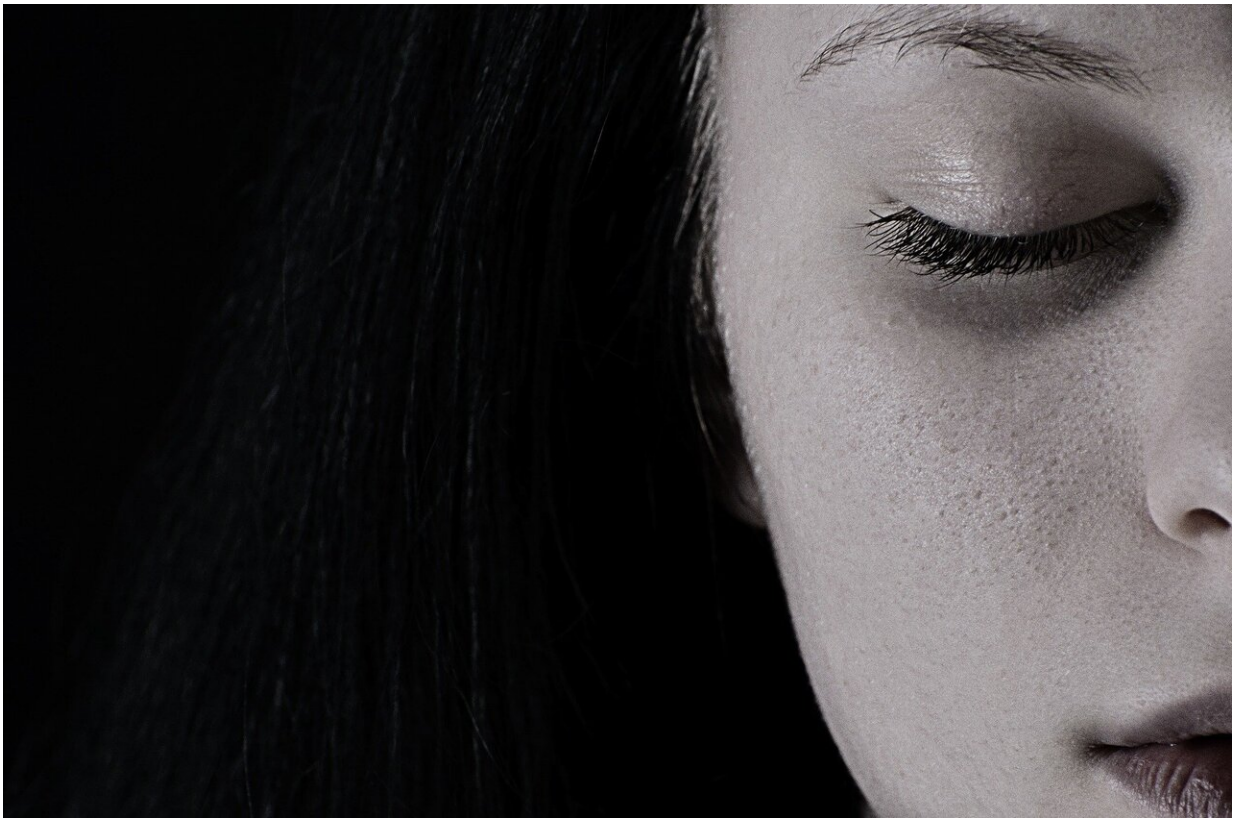

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A new review study looking at the current state of neuromodulation therapies being used to treat depression, including rTMS, ECT and others, is available online today in the December issue of *The American*

Journal of Psychiatry.

For many decades, psychiatric treatment has been primarily focused on the development of medications and the development of psychotherapies. A third type of approach gaining attention in recent years is based in the concept that "that psychiatric dysfunction results from abnormal communication within a network of brain regions that regulate mood, thought, and behavior," the authors write.

The development of a number of neuromodulation and neurostimulation therapies, the authors note, has been made possible by "technological advances that have revolutionized our ability to understand and modulate the neural circuitry involved in psychiatric disorders."

Electroconvulsive therapy (ECT), first developed in 1938, was one of the first attempts to directly affect neural function via stimulation. Many modifications since then have improved its safety and reduced its side effects. ECT, the authors note, "remains the single most effective treatment for depression." Study authors Susan K. Conroy, M.D., Ph.D., with Indiana University School of Medicine, Indianapolis, and

Paul E. Holtzheimer, M.D., with the Geisel School of Medicine at Dartmouth, also review treatment methods involving surgery, including deep brain stimulation (DBS), which involves implanting electrodes within certain areas of the brain, and vagus nerve stimulation (VNS), which involves surgically implanting a stimulator on the vagus nerve.

Technological advances in the past couple of decades have also led to development of "noninvasive" neuromodulation approaches, which come with fewer side effects and risks than ECT or surgical procedures. One method, repetitive transcranial magnetic stimulation (rTMS), uses rapidly alternating magnetic pulses that pass through the skull. Much research is underway looking at potential improvement in rTMS devices

and protocols for treatment of depression. Accelerated rTMS, the authors report, "may have the potential to improve symptoms more quickly than current protocols by providing multiple sessions in a single day." (See related research: Stanford Neuromodulation Therapy (SNT): A Double-Blind Randomized Controlled Trial in the *American Journal of Psychiatry*.)

The authors note that the three primary types of treatment—medication, psychotherapy and neuromodulation—are complimentary, not mutually exclusive, and the combination of neuromodulation treatments with other modalities is an area for future study. For example, "taking advantage of the enhanced neuroplasticity engendered by rTMS by providing psychotherapy within a specific time frame has the potential to synergistically improve efficacy and extend the effect of both treatments."

More information: Susan K. Conroy et al, Neuromodulation Strategies for the Treatment of Depression, *American Journal of Psychiatry* (2021). DOI: 10.1176/appi.ajp.2021.21101034

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