

# Deep brain stimulation shows promising results for unipolar and bipolar depression

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A new study shows that deep brain stimulation (DBS) is a safe and effective intervention for treatment-resistant depression in patients with either unipolar major depressive disorder (MDD) or bipolar II disorder (BP). The study was published Online First by *Archives of General Psychiatry*.

The study was led by Helen S. Mayberg, MD, professor in the Departments of Psychiatry and Behavioral Sciences and Neurology at Emory University School of Medicine, with co-investigators Paul E. Holtzheimer, MD, lead psychiatrist and now associate professor and director of the Mood Disorders Service, Dartmouth Medical School, and neurosurgeon Robert E. Gross, MD, PhD, associate professor in the Departments of Neurosurgery and Neurology at Emory. Gross served as chief neurosurgeon for the study.

"Depression is a serious and debilitating medical illness," says Mayberg. "When we found that the potential for effective and sustained antidepressant response with DBS for patients with otherwise treatment resistant major depressive disorder was high, the next step was to determine if patients with intractable bipolar depression could also be successfully treated."

An earlier study by Mayberg done in Toronto in collaboration with scientists at Toronto Western Hospital, University Health Network and Emory, was the first to show such results for patients with treatment-resistant major [depressive disorder](#). Mayberg conducted this new

expanded trial at Emory to include patients with bipolar II disorder.

Bipolar spectrum disorder, sometimes referred to as manic-depression, is characterized by bouts of mania or hypomania alternating between episodes of depression. Although people with bipolar II disorder do not have full [manic episodes](#), [depressive episodes](#) are frequent and intense, and there is a high risk of suicide. A major challenge in treating bipolar depression is that many antidepressant medications may cause patients to "switch" into a hypomanic or manic episode.

DBS uses high-frequency electrical stimulation targeted to a predefined area of the brain specific to the particular neuropsychiatric disorder. Here, each study participant was implanted with two thin wire electrodes, one on each side of the brain. The other end of each wire was connected under the skin of the patient's neck to a pulse generator implanted in the chest – similar to a pacemaker – that directs the electrical current.

Study participants received single-blind stimulation for four weeks (patients did not know if the DBS system was on or off), followed by active stimulation for 24 weeks. Patients were evaluated for up to two years following onset of active stimulation. Seventeen patients were enrolled in the study.

A significant decrease in depression and increase in function were associated with continuing stimulation. Remission and response rates were 18 percent and 41 percent after 24 weeks; 36 percent and 36 percent after one year and 58 percent and 92 percent after two years of active stimulation. Patients who achieved remission did not experience a spontaneous relapse. Efficacy was similar for [Major Depressive Disorder](#) and Bi-Polar patients, and no participant experienced a manic or hypomanic episode.

Mayberg and her colleagues continue to refine this intervention. Current studies include demographic, clinical and imaging predictors of response and remission, and introduction of psychotherapeutic rehabilitation. Why and how this treatment works is the primary focus of ongoing research.

"Most of these patients have been in a depressed state for many years and are disabled and isolated," says Holtzheimer. "As their depression improves, they need a process to help them achieve full recovery that includes integration back into society.

"We hope to optimize the rate of improvement for these [patients](#) by using a model of care that provides psychotherapeutic rehabilitation built on evidence-based psychotherapy but tailored to the specific individual's situation."

Provided by Emory University

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