

# Deep brain stimulation for treating schizophrenia

June 25 2021, by Marisol Martinez

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Managing schizophrenia is a lifelong process, and although there's no cure, it can be treated with medications and therapy. However, one-fifth to one-half of patients with schizophrenia who show severe symptoms don't respond to medication. Now, Johns Hopkins Medicine researchers have found a novel way to treat patients who have treatment resistant schizophrenia by using the same type of deep brain stimulation hardware

used to treat Parkinson's disease and other movement disorders.

The [case study](#), published online April 24 in *Biological Psychiatry*, details how this procedure targets the substantia nigra pars reticulata—a part of the brain that's a key hub of circuits involved in control of learning, executive functions and behaviors, and emotions. When this part of the brain is modulated using deep brain stimulation, it showed the potential to alleviate treatment resistant schizophrenia symptoms.

"Deep brain stimulation could be a game changer for schizophrenia patients who don't respond to medication," says lead author Nicola Cascella, M.D., assistant professor of psychiatry and [behavioral sciences](#) at the Johns Hopkins University School of Medicine, and faculty member at the Johns Hopkins Schizophrenia Center. "This is not a cure for schizophrenia. It's an innovative way to treat the symptoms, and so far for our patient, the treatment is working."

For the study, Cascella and his team treated a 35-year-old Caucasian woman who has treatment resistant paranoid schizophrenia, accompanied by obsessive-compulsive disorder. Her symptoms consisted of persistent auditory and visual hallucinations, thought broadcasting—a person believes his or her thoughts are audible—and persecutory delusions . Antipsychotic medications, including clozapine, failed to reduce her symptoms.

After one year of deep brain stimulation, the patient remains stably improved, with no significant complications or adverse reactions related to the implanted device. The patient reported immediate and complete resolution of chronic hallucinations right from the start of stimulation. As a result, she's in the process of decreasing the dose of her [antipsychotic medications](#) and has an improved quality of life.

Schizophrenia is caused by a chemical imbalance and other changes in

the brain. It tends to run in families and it usually starts in late adolescence and early adulthood. Each person may have a combination of symptoms that may include hearing voices and other type of hallucinations, having trouble thinking clearly and relating to others. Level of functioning and quality of life can be severely affected.

While long-term efficacy remains to be seen in larger trials, these results provide hope for patients with severe, treatment resistant schizophrenia, and they suggest that [deep brain stimulation](#) may be more effective for [schizophrenia](#) than response rates noted in multiple antipsychotic medication clinical trials.

**More information:** Nicola Cascella et al, Deep Brain Stimulation of the Substantia Nigra Pars Reticulata for Treatment-Resistant Schizophrenia: A Case Report, *Biological Psychiatry* (2021). [DOI: 10.1016/j.biopsych.2021.03.007](#)

Provided by Johns Hopkins University

Citation: Deep brain stimulation for treating schizophrenia (2021, June 25) retrieved 24 April 2024 from <https://medicalxpress.com/news/2021-06-deep-brain-schizophrenia.html>

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