

Treatment resistant depression surgery

First-line treatment includes [pharmacotherapy](#), [psychotherapy](#), and forms of non-invasive brain stimulation such as [transcranial magnetic stimulation](#) and [electroconvulsive therapy](#). Patients who fail conservative therapy may be candidates for functional neuromodulatory procedures.

Initial attempts at surgical treatment for chronic depression or major depressive disorder (MDD) included nonspecific destructive surgeries such as the prefrontal leucotomy ([lobotomy](#)). After these procedures fell out of favor, more selective ablative procedures targeting the orbitofrontal cortex and the medial prefrontal cortex were attempted. Recently, [DBS](#) targets investigated for treatment of medically intractable depression include: the subcallosal cingulate gyrus, inferior thalamic peduncle, [nucleus accumbens](#), and ventral capsule / [striatum](#).^{1) 2) 3)}

Several of these targets gained interest after patients undergoing DBS for [OCD](#) noted improved mood as a side effect⁴⁾. Vagus nerve stimulation (VNS) has also been explored as an option after patients receiving VNS for seizures were noted to have an improvement in depressive symptoms independent of seizure control⁵⁾

Deep Brain Stimulation

see [Deep Brain Stimulation for depression](#).

Vagus nerve stimulation

see [Vagus nerve stimulation for depression](#).

Gamma Knife subcaudate tractotomy for treatment-resistant depression

Gamma Knife subcaudate tractotomy for treatment-resistant depression and target characteristics⁶⁾.

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Jimenez F, Velasco F, Salin-Pascual R, et al. A patient with a resistant major depression disorder treated with deep brain stimulation in the inferior thalamic peduncle. *Neurosurgery*. 2005; 57:585-93; discussion 585-93

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Lozano AM, Mayberg HS, Giacobbe P, et al. Subcallosal cingulate gyrus deep brain stimulation for treatment-resistant depression. *Biol Psychiatry*. 2008; 64:461-467

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Malone DA, Jr, Dougherty DD, Rezai AR, et al. Deep brain stimulation of the ventral capsule/ventral striatum for treatment-resistant depression. *Biol Psychiatry*. 2009; 65:267-275

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Nuttin BJ, Gabriels LA, Cosyns PR, et al. Long-term electrical capsular stimulation in patients with obsessive-compulsive disorder. *Neurosurgery*. 2003; 52:1263-72; discussion 1272-4

5)

Elger G, Hoppe C, Falkai P, et al. Vagus nerve stimulation is associated with mood improvements in epilepsy patients. *Epilepsy Res.* 2000; 42:203-210

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Hariz M. Gamma Knife subcaudate tractotomy for treatment-resistant depression and target characteristics. *Acta Neurochir (Wien)*. 2016 Nov 8. [Epub ahead of print] PubMed PMID: 27826803.

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