

Neurostimulation

Neurostimulation is a therapeutic activation of part of the nervous system using micro[electrodes](#). The electrodes are used to interface with excitable tissue in order to either restore sensation, such as a cochlear implant for hearing, or control an organ, such as a heart pacemaker.

Neurostimulation technology improves the life quality of those who are severely paralyzed or suffering from profound losses to various sense organs. It serves as the key part of neural prosthetics for hearing aids, artificial vision, artificial limbs, and brain-machine interfaces. In the case of neural stimulation, mostly an electrical stimulation is utilized and charge-balanced biphasic constant current waveforms or capacitively coupled charge injection approaches are adopted. Alternatively, the [transcranial magnetic stimulation](#) has been proposed as a non-invasive method in which a magnetic field causes neurostimulation.

First employed in 1954, intracranial neurostimulation represents one of the earliest uses of neurostimulation to treat chronic pain that is refractory to medical therapy. Currently, 2 kinds of intracranial neurostimulation are commonly used to control pain: [motor cortex stimulation](#) and [deep brain stimulation](#).

MCS has shown particular promise in the treatment of trigeminal neuropathic pain and central pain syndromes such as thalamic pain syndrome. DBS may be employed for a number of nociceptive and neuropathic pain states, including cluster headaches, chronic low back pain, failed back surgery syndrome, peripheral neuropathic pain, facial deafferentation pain, and pain that is secondary to brachial plexus avulsion. The unique lack of stimulation-induced perceptual experience with MCS makes MCS uniquely suited for blinded studies of its effectiveness ¹⁾.

see [Deep brain stimulation](#).

see [Motor cortex stimulation](#)

¹⁾

Levy R, Deer TR, Henderson J. Intracranial neurostimulation for pain control: a review. Pain Physician. 2010 Mar-Apr;13(2):157-65. Review. PubMed PMID: 20309382.

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