

Deep Brain Stimulation at Cleveland Clinic

**Surgery in Cleveland.
Ongoing care in Las Vegas.**

What is Deep Brain Stimulation?

Deep brain stimulation (DBS) involves a surgical procedure to place stimulation electrodes into the deep structures of the brain — the thalamus (for essential tremor) or subthalamic nucleus or globus pallidus (for Parkinson's disease or dystonia). The electrodes are connected by wires to a pacemaker device called an implantable pulse generator (IPG), implanted under the skin of the chest just below the collarbone.

Once activated, the device delivers continuous electrical pulses to the target areas to modify the dysfunctional brain circuits that are responsible for motor symptoms of the disease.

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How effective is DBS surgery?

DBS surgery is FDA approved and is the most effective surgical treatment for essential tremor, dystonia, and Parkinson's disease (PD). In addition to controlling tremor and dystonia, DBS can improve rigidity, slowness of movement, and difficulty walking in PD. The vast majority of properly selected patients experience a marked improvement of their motor symptoms related to essential tremor, dystonia, and PD. Most people are able to significantly reduce their medications.

Am I a candidate?

A comprehensive evaluation will be performed to ensure you are a good candidate. One of the most important criteria is to have had an adequate trial of medications for the condition. Surgery is not recommended if medications can adequately control the disease. A good candidate must be healthy enough to undergo surgery and not demonstrate significant cognitive impairment that could limit the benefits of the therapy. Talk to your Lou Ruvo Center for Brain Health movement disorders specialist to see if DBS is right for you.

What are the advantages?

Deep brain stimulation has many advantages, notably:

- DBS can greatly improve quality of life by reducing tremor and/or improving motor function
- It does not damage brain tissue
- DBS may be reversible: The stimulator can be turned off or the electrodes potentially removed
- Most individuals are able to significantly reduce their medications following DBS surgery
- The electrical stimulation can be easily adjusted if your symptoms or response to medication changes. This can be done at the Lou Ruvo Center for Brain Health in Las Vegas; no further surgery is necessary to make the adjustments



Enjoying Cleveland: The cultural, dining, and major league sports amenities

While visiting Cleveland, consider partaking in the city's diverse cultural, major league sports and dining amenities. Enjoy the influence of this multinational city through its diverse food scene, world-class museums (Cleveland Museum of Art; Rock and Roll Hall of Fame and more), 2016 NBA Champion Cleveland Cavaliers, or highly acclaimed Cleveland Orchestra. Enjoy the local markets, such as the nationally-renowned West Side Market.



Why have your DBS surgery at Cleveland Clinic?

Outcomes can vary after DBS, and it is extremely important to have surgery at a center with extensive expertise and frequency in performing the procedure. Our neurology/neurosurgery program is ranked No. 6 nationally by *U.S. News & World Report*. In the past 10 years, we have implanted DBS leads in more than 925 patients at the Cleveland Clinic main campus.



The DBS procedure utilizes the full resources of our multi-disciplinary team of experts at our Cleveland and Las Vegas campuses: Our neurologists, neurosurgeons and neuropsychologists have expertise and specialized training in DBS, and will provide ongoing assessments and modifications to assure you receive optimal continuity of care. “Virtual visits” utilize videoconference technology, allowing you to see the Cleveland-based neurosurgery team and your Las Vegas-based movement disorders specialist at the same time to ensure you receive comprehensive care.

For ongoing communication, your care team uses a centralized electronic medical record across Cleveland Clinic. Via our online tool, MyChart, you and any family caregivers you authorize can message your Las Vegas-based care team or Cleveland-based surgical team at any time with questions or concerns about your condition.

Will the surgery be covered by insurance?

This FDA approved procedure is covered by Medicare in most states for the treatment of Parkinson’s disease, dystonia, and essential tremor. Many commercial insurance companies also cover the costs of deep brain stimulation surgery.

To determine if your insurance policy covers all or a portion of the costs, please contact your insurance provider directly.

The Practical Details: Sequence of events

After your initial evaluation in Las Vegas, we will then set up a videoconference with our Cleveland-based neurosurgery team to ensure your eligibility and to answer any questions you may have prior to your trip.

Surgery is conducted on Mondays, Tuesdays, and Wednesdays, so those who are eligible for surgery and are traveling in from out of town will likely do so one or two days before, allowing time for require pre-surgical assessments (labs, EKG).

For patients with symptoms on only one side of the body, the stimulation electrodes only need to be implanted on one side (the side of the brain opposite the symptoms).

However, most surgical candidates will need to have stimulation electrodes implanted into both sides of the brain, which is considered a bilateral procedure. Under some circumstances, the surgery is completed all at once, but more frequently, DBS surgery is done via a staged approach in two operations within a week of each other. In some cases, additional time is required for recovery and evaluation, and the second procedure may require a return visit to Cleveland.

Here is an overview of what to expect with the most common multi-step, five to seven day approach.

The first surgery (in Cleveland)

The electrodes are implanted into the brain. In some cases, it may be necessary to briefly awaken you during the procedure to test the effects of the stimulation. Local anesthetic (pain-relieving medication) is given to the sensitive areas. Most people report mild discomfort related to the incisions needed for the surgery and only stay one night in the hospital after the surgery.

The second surgery (in Cleveland)

Five to seven days later, you will be readmitted to the hospital to insert the IPG. While under general anesthesia, an extension wire is inserted to connect one end of the brain electrodes to the battery/generator.

What should you expect immediately following the surgery in Cleveland?

After DBS implantation, as with any surgical procedure, your body will need time to heal. You may feel tired and sore, but pain medications can be provided as needed to keep you comfortable. You may feel up to leaving your hotel for short periods to enjoy some of the leisure activities the city has to offer. Your safe, full recovery is our number one priority.

Activating the device via a short outpatient procedure (in Las Vegas) and ongoing maintenance of the device

Two to four weeks later, the IPG is turned on and adjusted by your neurologist at the Lou Ruvo Center for Brain Health and symptom relief begins.

Your Lou Ruvo Center for Brain Health neurology provider will continue to provide your ongoing care through routine appointments, which will now include adjustments as needed to your implanted device. These non-invasive adjustments can be made during a normal office visit and require no special preparation on your part.

Coming soon: The Lou Ruvo Center for Brain Health in Las Vegas will offer a support group for patients and families who have experienced DBS surgery. Ask us for more details.

Post-surgical care:

How should you care for the surgical area at home?

- Your stitches or staples will be removed 10-14 days after surgery.
- You may wash your head with a damp cloth, avoiding the surgical area.

In the weeks following the surgery

- Do not engage in housework or other activities that would require you to lift more than five pounds) for 2 weeks after surgery. Light aerobic activity, especially walking is encouraged.
- Do not engage in heavy activities (jogging, swimming) for 4 to 6 weeks after surgery.
- Depending on the type of work you do, you may return to work within 4 to 6 weeks.

Cleveland: Travel and tourism

Getting there

We understand that contemplating brain surgery can be overwhelming, and we want you to focus on care and recovery rather than the logistics of your travel. We are well equipped to make your travel to our main campus in Cleveland, Ohio, as easy as possible, assisting with:

- Airline reservations: Cleveland, Ohio is a 3 ½ to 4 hour flight with multiple non-stops daily between McCarran Airport and Cleveland Hopkins Airport
- Transportation to and from the airport via complimentary limousine service
- Lodging at a variety of price points and proximity to campus, including one hotel, the Intercontinental, that is on campus and accessible to the hospital via indoor walkways
- Transportation from your hotel to Cleveland Clinic should you elect to stay off campus

There is no charge to you to have your travel coordinated by our dedicated travel agency, American Express. Your Cleveland Clinic Care Coordinator will facilitate an introduction to this service. Should the pace of your recovery require adjustments to your lodging or flight home, American Express is available 24/7 to accommodate your changing travel needs.

Getting around campus

Once on our main campus, you’ll quickly notice the enormity and breadth of Cleveland Clinic’s services. To ease your navigation, we offer easy online guidance via your smart phone: clevelandclinic.yourdirectroute.com

