

### Who is a candidate for DBS?

Patients with essential (familial) tremor that have not had an adequate response to at least 1 or 2 medications and whose tremor impairs their quality of life are likely to be good candidates for DBS.

### What symptoms are expected to improve with DBS?

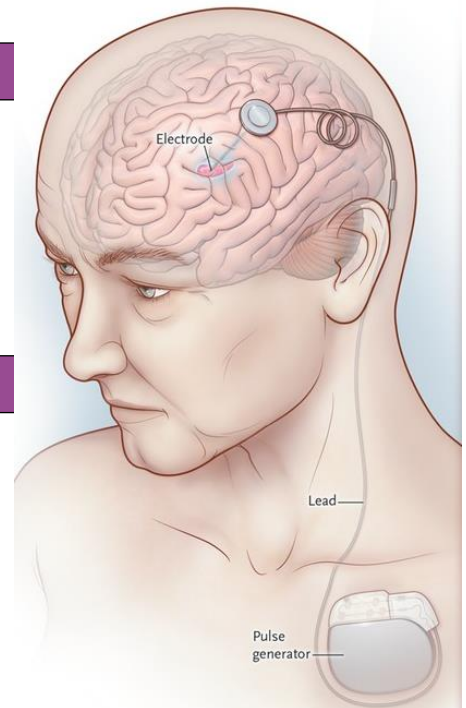
DBS is a highly effective therapy for patients with essential tremor, often resulting in tremor reduction of 80% or more. DBS works well to reduce tremor of the hands, but it also improves tremor in other body parts such as the head, voice, and legs, but this effect may be less.

### What is DBS?

DBS surgery involves placing a thin electrode (about the diameter of a piece of spaghetti) into the target (VIM, thalamus) on one or both sides of the brain. The electrode is connected to a battery, which is implanted under the skin in the chest below the collarbone. All parts of the stimulator system are internal; there are no wires coming out through the skin.

### How does DBS work?

DBS is not a cure for movement disorders, but it can successfully treat symptoms by disrupting the abnormal patterns of brain activity that become prominent in these diseases. DBS is often described as a brain “pacemaker” because constant pulses of electrical charge are delivered at settings that are thought to restore normal brain rhythms, allowing the restoration of more normal movements. The exact mechanisms of this neuromodulation are still unknown.



### How is the surgery performed?

UPMC was one of the first centers to use ROSA robotic assistance for the placement of DBS electrodes. ROSA is similar to a GPS device for the brain. It provides the surgeon with a roadmap to reach the intended brain targets. You will be sedated for the beginning of the surgery while we make a small opening in the skin and bone at the surgical site(s). You will not feel or remember this part of the surgery, but once these steps are complete, you will be woken up for the remainder of the surgery.

#### **Brain Mapping**

We use neurophysiology recordings from very thin electrodes inserted into the brain to map activity in the intended target and confirm the best spot for the DBS electrode. It is important for you to be awake during this part of the surgery so we can obtain the best recordings possible, which will aid in the most accurate placement of the DBS electrode. The brain mapping is not painful and the surgical team will be available to provide reassurance and feedback the entire time.

#### **Intra-Operative Stimulation Testing**

When the best site is identified from the brain mapping, the DBS electrode is inserted and tested. We carefully monitor you for improvement in tremor, and also ask you to report any new sensations you experience. Again, this part of the procedure is not painful, but provides valuable feedback to the surgical team.

## Stage 2

You will return an average of 2 weeks later for a second procedure to place the battery and connect it to the brain electrodes. This surgery is very short and performed as an outpatient procedure

### What is it like to be awake during surgery?



Some patients report a mild headache or pressure sensation at times during the surgery, but you will not feel the surgery being performed. You may also feel some stiffness or soreness in your neck or back from the positioning. We understand that the thought of being awake for part of a brain surgery can be overwhelming and scary. We advise you to discuss your concerns with your surgical team. Accommodations can be considered for patients who are unable or unwilling to participate in an awake surgery.

### Which DBS system should I get?

At UPMC, we are excited to offer our patients a choice of which DBS system is best-suited for them. There are now 3 different DBS systems available, and our team has experience with all of them. Ultimately, the decision is yours, but our team will help guide you in making this important decision. Please keep in mind that all 3 systems are more alike than different, and all are expected to improve your symptoms. However, each system has its own advantage that sets it apart from the others, and one might fit your lifestyle better than another. All 3 systems are MRI-compatible, and all 3 come with a patient programmer (remote) which you can use to adjust your DBS within a pre-set range.

We offer both primary cell and rechargeable DBS batteries. The primary cell battery will need to be replaced approximately every 2-5 years. This is done through a short outpatient procedure. The rechargeable battery lasts 15 years before needing replacement, but you must keep the battery charged in order for your DBS to work. The recharging process is easy for most, but some patients prefer not to take on this responsibility and choose the non-rechargeable option.

### What are the risks of DBS?

The risk of DBS is low, but no surgery is without risk. There is a risk of bleeding (~1%) and infection (3-5%). Although uncommon, there is a chance DBS will not improve your tremor as much as you had hoped.

### What is the recovery like?

Following the stage 1 procedure, you will be observed in the hospital for 1 night and likely be discharged home the next day. Older patients or those with other medical conditions may need to stay longer, or sometimes these patients are briefly admitted to a rehabilitation facility before going home. You may have a mild headache for a few days, and you may have some swelling in your face. The stage 2 procedure is performed as an outpatient surgery, and may cause some soreness in the neck and chest. Most patients report a full recovery within 2-4 weeks.

## What is DBS programming?

The surgery is just one half of DBS. The other half is the programming after surgery. Although you have had 2 surgeries, your DBS is not yet turned on and it is not expected that your symptoms will be any better. You will follow up about 4-6 weeks after your surgery to have your DBS turned on for the first time. You should not expect an immediate improvement in your symptoms. Instead, the improvement with DBS is a slow, gradual one. It is important to note that DBS therapy may demand considerable time and patience before its effects are optimized. You can expect a follow up appointment every 1-3 months initially, but eventually these visits will become less frequent. DBS programming is performed in the office in a non-invasive fashion using a tablet or computer which communicates with your DBS battery.

## Will DBS replace my medications?

Although we cannot make any guarantees, in our experience most patients with tremor are able to at least reduce the dose of their tremor medication(s) after their DBS programming is optimized, and some are able to stop medication altogether. You should not adjust the dose or stop taking your medications without speaking to your medical team first.

## Contact Us

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