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Brain and Spine Surgery

PATIENT GUIDE

Deep brain stimulation (DBS): my guide for patients

What to expect before, during, and after DBS surgery, from preparation through programming.

AT A GLANCE

Anesthesia	Asleep (general anesthesia)
Stage 1, brain wires	40-70 minute surgery, one night in the hospital
Stage 2, battery	About 25 minutes, outpatient, 1-3 weeks later
Programming	About 4 weeks after stage 1, in your neurologist's office
Wound check	In my office, about 2 weeks after stage 2

This information is intended as a general guide for my patients, and if you are seeing a different neurosurgeon, it should not substitute for advice, guidance, or instructions from that surgeon.

Introduction

Deep brain stimulation (DBS) is a procedure in which a thin wire is inserted into the brain and connected to a battery implanted under the collarbone, similar to a pacemaker. The system delivers targeted and painless electrical pulses to the brain. DBS is a safe, effective therapy that has been used in the US for 25 years for Parkinson's disease and 30 years for essential tremor. This is a guide for my patients about what to expect from DBS for movement disorders such as Parkinson's disease, essential tremor, and dystonia. You can also read more on my DBS page.

Benefits of DBS

Over the past 30 years, a number of blinded, randomized clinical trials have provided evidence for the benefits of DBS.

For Parkinson's disease, studies have established the following benefits:

- Improvement in tremor, stiffness, slowness, and other motor (movement) symptoms.
- More time at best motor function (an additional 4-5 hours a day).
- Reduction in Parkinson's medication dose needs.
- Improvement in functional status (the ability to perform activities of daily living).

For essential tremor, the average patient can expect an 85-90% reduction in hand and arm tremor.

For both Parkinson's and essential tremor, a consistent finding across studies is that DBS patients report improved quality of life.

What to expect from surgery

DBS is performed in two separate surgeries: insertion of the brain electrodes (stage 1) and placement of the battery in the chest (stage 2). Below is an outline of what to expect from these two procedures, along with instructions for both before and after the operations.

Stage 1

Stage 1 is the bigger of the two surgeries, consisting of insertion of one or two wires in the brain. It takes roughly 40-70 minutes. After the surgery, you will be admitted to the hospital for an overnight stay.

- Starting at midnight on the evening before the procedure, you should have nothing to eat or drink, except small sips of water as needed for your medications.
- Make sure you have reviewed with my team whether and when to stop any blood thinning medications (examples: aspirin, Plavix, Coumadin/warfarin, Lovenox, Xarelto, Eliquis, fish oil, etc.).
- On the morning of the procedure, I will meet you in the pre-op area and review the plan for the day.
- I perform stage 1 with you asleep (general anesthesia).
- In the operating room, I will shave a small amount of hair around the incision area. I do not shave the whole head.
- The surgery lasts 40-70 minutes, but the total time in the operating room is close to 2 hours, which includes anesthesia and equipment setup. Incisional soreness and/or headache are common initially, and they tend to improve over a few days.

- A dressing is placed over the incision and often stapled to the scalp. It is removed the day after surgery. The sutures beneath the dressing are dissolvable (absorbable).
- After the surgery, you will be admitted to the hospital for observation. You will also have a CT scan of your brain.
- Most patients are able to leave the hospital the following day. In order to go home, you need to be eating, drinking, and safe and steady on your feet.
- I will notify your neurologist that the procedure has been performed. Nonetheless, it is a good idea for you to call your neurologist's office to set up an appointment for roughly 4 weeks after stage 1 to have the device turned on.

On occasion, stage 1 causes a period of temporary confusion or “fogginess.” There are a few reasons for this: stress of the procedure, medications given for anesthesia, introduction of the DBS wires into the brain, disruption of your daily routine, an unfamiliar hospital environment, and so on. Older patients are at a higher risk than younger patients. The confusion is temporary, but it is important to understand that it can happen and to be prepared if you or your family member is affected. More details are provided under post-op care, below.

You may notice a small bump on your scalp behind and above your ear. This is normal, and the bump is due to the protective caps sitting on the ends of the wires under the scalp. The bump will shrink (and move) after the stage 2 surgery.

Stage 2

Stage 2 is a smaller surgery than stage 1. The DBS battery is placed under the skin beneath the collarbone. It is usually performed 1-3 weeks after stage 1.

- As with stage 1, you should not have anything to eat or drink after midnight before your surgery.
- Stage 2 is a shorter procedure (25 minutes), and it is always done under general anesthesia.
- Stage 2 is outpatient, meaning you can go home the same day. There is no hospital admission.
- After stage 2, the entire DBS system has been implanted, but it is not yet turned on. The system is usually turned on and programmed in your neurologist's office roughly 4 weeks after stage 1.

Summary of instructions before surgery

- If you take a blood thinner such as aspirin, Plavix, warfarin (Coumadin), Eliquis, Xarelto, Lovenox, or fish oil supplements, make sure you have confirmed with me when I would like you to stop the medication before surgery.

- When you have scheduled a date for stage 1, please notify your neurologist to arrange for an initial programming visit 4 weeks or so later.
- Do not have anything to eat or drink after midnight on the night before your surgery. Do not have breakfast on the day of surgery.
- Be prepared to stay in the hospital for one night after stage 1 and to go home on the same day as stage 2.
- Please call my office with any questions.

Post-op care

Wound care

- I use absorbable sutures, so your stitches do not need to be removed.
- Skin glue may be used over the battery incision on your chest. This will normally flake away over time.
- You may shower the day after each of your surgeries. Normal shampoo is fine to use. Do not scrub or rub the incisions too hard. Instead, let the soapy water run over them, and then pat them dry. You can wash the rest of your hair normally. While showers are OK, please do not take baths or go swimming until after your wound check appointment.
- Please do not apply any ointments or creams to your incisions. The best way for them to heal is to leave them clean, dry, and open to the air.
- You will have a wound check in my office roughly 2 weeks after stage 2.

Medications

- You should resume your Parkinson's or tremor medications immediately after surgery.
- If you take blood thinners such as aspirin, Plavix, warfarin (Coumadin), Eliquis, and so on, remember to discuss with me how soon you should restart them after surgery.
- You will be discharged with a short course of prescription medication for pain control. You do not have to take this medication unless you need it. Over-the-counter alternatives like Tylenol and Motrin are fine to use, too (though please avoid aspirin). Most patients do not need prescription medication for more than a few days.

Activity

You can resume most of your normal day-to-day activities almost immediately after surgery. The exception is activities that involve straining, like lifting heavy objects (anything much heavier than a gallon of milk) and vigorous exercise. You should wait 2-4 weeks before these activities, and begin them gradually.

Over time, some patients can develop tightness in the neck along the wires due to scarring. This is called “bowstringing.” While not dangerous, it can be annoying. For the first few months after your DBS, it is a good idea to add gentle neck stretching to your daily routine. One example stretching routine is to lean the head to each side for 10 seconds, turn each side for 10 seconds, and then flex and extend the neck for 10 seconds each. Doing this a few times a day before the wires scar in place can help avoid bowstringing.

Programming

DBS will be turned on in your neurologist's office roughly 4 weeks after stage 1.

Please be patient with the effects of stimulation. We usually start at low settings and then ramp them up gradually. It often takes several programming visits to get the settings just right. Parkinson's and dystonia tend to take longer than essential tremor, and the process may take a few months. Do not be discouraged if you do not see a dramatic improvement after your first programming session.

Confusion

As discussed above, some patients may experience a temporary period of confusion or “fogginess” initially after DBS surgery. Older patients are at a higher risk than younger patients. Parkinson's patients are at a higher risk than essential tremor and dystonia patients. Be patient. The symptoms will improve over time.

You may need more assistance than usual at home in the first few weeks after surgery. If you live alone, plan ahead to have a friend or family member nearby or ready to assist, if needed.

There are certain things you and your family can do to reduce the risk of confusion and to shorten its duration, if it happens:

- As much as possible, keep a steady routine from day to day.
- Stick as close as possible to your medication schedule. Do not skip doses, take extra doses, or take doses at unusual times.
- Stay active. Walking is an excellent way to begin rehabilitation after surgery.
- Keep good sleeping habits. Set a reasonable bedtime and stick with it. If you have trouble falling asleep, you can try melatonin, which is effective, gentle, and can be purchased over the counter.

When to call my office

Be vigilant in the first few weeks after surgery. Please call my office if you develop any of the following:

- Fever higher than 101.5°F.

- New redness, swelling, or drainage from your incision. A little redness and swelling is normal immediately after surgery, but it should get better each day, not worse.
- Eye or facial swelling. Many patients notice a swollen eye a few days after surgery, usually after waking up. This is common and not dangerous, and it relates to fluid working its way down beneath the scalp from the surgery site. Elevating the head for a night while sleeping can help. You only need to call if this does not improve in a day or two or if there are other concerning symptoms.
- New neurologic problems: weakness, numbness, seizure, visual changes, difficulty speaking, and so on.
- Confusion that gets gradually worse rather than better.

If you are experiencing a medical emergency, please call 911.

For questions or concerns that are not a medical emergency, you can reach my medical assistant directly at (720) 599-3075 or MDMian@carepointhc.com. You can also call the CarePoint Neurosurgery main line at (303) 515-2320.

If you or a family member is considering DBS and has not yet met with me, please consider meeting me in consultation to learn more about your treatment options.