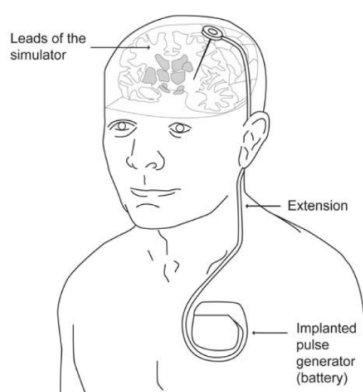


# Deep Brain Stimulation

## Education

Deep Brain Stimulation (DBS) is a surgical procedure used to treat a variety of movement disorders such as Parkinson's disease, essential tremor, and dystonia. A pacemaker-like 'pulse generator' is used to electrically stimulate one of several areas in the brain, referred to as the 'target'. The location of the target depends on the condition being treated, for example:

- Subthalamic Nucleus (STN) – for Parkinson's disease (PD)
- Globus Pallidus Internus (GPi) – for dystonia and sometimes PD
- Posterior Subthalamic Area (PSA) – for essential tremor.



Deep Brain Stimulation, Herston Multi Media Unit, RBWH, 2009

## Prior to Surgery

Prior to surgery, patients will undergo assessments by the Neurologist, Neuropsychiatrist (to assess mood symptoms and psychiatric vulnerability), Neuropsychologist (to evaluate your baseline thinking skills), Neurosurgeon and DBS nurse to determine suitability for the surgery.

A brain scan is also required (MRI and/or CT) to ensure there are no brain changes that might prevent surgery.

## DBS Surgery

The procedure involves placement of special wires (called electrodes or stimulator leads) in specific regions of the brain. A special frame supports your head during surgery so the electrodes can be placed precisely.

A very fine test electrode is first inserted into the brain to monitor the electrical activity and determine the best position for the electrode. Some test stimulations are then conducted to assess your movement disorder symptoms and any side effects.

To run the stimulation, you will be temporarily woken up from the anaesthetic. When a good response is obtained, the test electrode is removed, and a permanent stimulator lead is inserted. You will be anaesthetised again to complete the surgery. A neurostimulator/battery is implanted underneath your skin just under your collarbone.

An extension lead is placed under your skin from your head and neck to your chest to connect the stimulator lead in your brain to the neurostimulator/battery. A modest bump will be visible on your chest where the battery sits. On average the battery will last between 2 to 4 years. A chargeable battery may be used which can last over 10 years. The total surgery time can take about 4-5 hours.

## Risks of surgery

There are risks and complications associated with this surgery including headache, infection, bleeding, minor pain, heart attack, stroke, visual disturbance, memory difficulties, speech disturbance, psychological/neuropsychiatric symptoms, Deep Vein Thrombosis, movement of wires, leads or battery, seizures, fluid leakage from around the brain, lung problems, injury to the brain, death or persistent, recurrent symptoms and no guarantee the surgery will provide relief of symptoms.

## Complications

If you experience any of the following symptoms, contact the RBWH movement disorder team or alternatively your general practitioner (GP), or emergency department if after-hours:

- Any different, worsening, or sudden headache; neck stiffness, increased temperature, or pain when you look at light; skin rash, lethargy or tiredness that doesn't improve
- Chest pain or calf pain
- Fits/seizures, confusions or 'funny turns'

- Blurred or worsening vision
- Weakness in your arms or legs
- Vivid dreams or hallucinations
- Vomiting or feeling sick
- There is a 10-20% chance of neuropsychiatric side effects following some DBS surgery, including changes in mood, depression, thoughts of suicide, rare cases of suicide, anxiety or OCD concerns, impulse control concerns including gambling or overspending, difficult-to-treat apathy, psychosis and personality change.

## Discharge

### Hospital stay after surgery

After surgery you will be admitted to a high dependency unit overnight and then transferred to the ward for the remainder of your admission. Usually, you will remain in hospital for up to one week. For patients who live  $\geq$  4-hour drive from Brisbane, it is recommended you remain in Brisbane until your first clinic review (within 1 week of hospital discharge), in case there are any post-operative concerns that require immediate assessment by the Movement Disorder team at RBWH.

### Returning to normal activities after surgery

You may return to your normal activities as soon as you feel up to them, however, avoid heavy lifting, strenuous activity, or arm movements over the shoulder for the first few weeks to allow the chest wound to heal.

No swimming until all wounds have completely healed (approximately 2-3 weeks).

If you were driving prior to surgery, you will not be able to return to driving for 3 months post-surgery.

### Medications

Continue to take all your medications for your movement disorder the same way you did prior to surgery unless your neurologist has told you otherwise. If you were asked to stop blood thinners such as aspirin or Plavix, you may restart these 2 days after surgery.

## Wound care

The wound on your head will be closed with staples which need to be removed 10 days after surgery. This may be done in hospital if you are still there or by your GP if you have already been discharged.

Keep the incisions dry for 5 days. Gentle washing around the incisions can be done 5 days after surgery but DO NOT scrub the incisions.

NO hair colouring, permanent solutions, or haircuts with clippers for 6 weeks post-surgery.

The wound on your chest will be closed with a dissolving stitch under the skin and reinforced with steri-strips. It should remain covered for one week with a sterile dressing which should be changed daily. The steri-strips will fall off on their own.

It's normal to feel some discomfort or pain at the wound sites as they heal. However, if there is any redness, tenderness, swelling or discharge of the wounds, or if you develop a fever you should see your GP immediately.

Stretch your neck away from the battery to prevent 'bowstringing' or the pulling of the extension lead in your neck. Gently bend your neck in an attempt to touch your ear to your shoulder. Stop when a stretch is felt. Repeat often while awake for the first 1-2 weeks.

## Follow up

After surgery, you will be seen regularly by your Neurologist to optimise your DBS programming; this can take 3-6 months following surgery. You will have follow-up appointments with all members of the movement disorder team (Neurologist, Neurosurgeon, Neuropsychiatrist, Neuropsychologist and Movement Disorder nurse) to monitor your recovery post procedure.

## Is DBS Therapy Permanent?

DBS is not designed to cure the movement disorder, but to improve symptoms. If there is progression of the disease, the benefit may decrease over time, although the system allows adjustments to try and compensate for this. In Parkinson's Disease DBS cannot make you any better than you are at your best 'ON' state

## Contacts

- In an emergency call 000
- Nurse: 07 3646 2559 (Mon-Thurs 07:00 - 15:30)
- RBWH-Neurology-  
MovementDis@health.qld.gov.au
- General Outpatients Neurology: 07 3646 3111
- Neurologist: RBWH Switch board (07) 3646 8111
- Medtronic patient helpline: 1800 652 972
- Abbott patient helpline: 1800 500 705
- Mental health hotline: 1300MHCALL