

Deep Brain Stimulation (DBS) Surgery for Parkinson's Disease

Atkinson Morley Movement Disorders Group

This information leaflet contains information about DBS and should answer some of your questions. If there is anything else you would like to know, please contact the Movement Disorder Team.

What is DBS Surgery?

Deep Brain Stimulation (DBS) involves implanting a fine wire into the brain. It may be one side or usually both sides of the brain (normally within the subthalamic nucleus) depending on the symptoms being treated.

A constant electrical pulse is sent through the wire to the brain. This changes the brain activity and reduces some of the symptoms of Parkinson's disease (PD).

Why should I have DBS Surgery?

DBS Surgery helps treat the "motor" symptoms of Parkinson's disease including stiffness, slowness and tremor and helps reduce fluctuations in these symptoms that occur in people who have had the condition for several years.

It's not a cure, but it may help to control many of your symptoms. It may also mean that you are able to take less medication, which can reduce the risk of medication side effects, such as involuntary movements (dyskinesia).

Are there any alternatives?

DBS surgery in Parkinson's disease is a good treatment in appropriate patients. It is usually offered as treatment to control fluctuations in medication response that have not responded well to adjustments.

Other treatments in this situation include continuous infusions of jejunal Levo-Dopa (Duodopa) given via a tube into the gut and Apomorphine via a continuous infusion under the skin. There is no good data directly comparing these treatments but your neurologist can discuss them with you.

How can I prepare for DBS Surgery?

Preparation for surgery involves a number of visits to the hospital to meet the members of the team who will be looking after you.

You will need to stay in hospital for a few days and will have two procedures, one to insert the wires and a second to implant the battery (IPG).

It is important that you stop certain drugs before surgery, especially ones which thin your blood.

It is very important that you contact the hospital at least two weeks before your admission if you are taking: aspirin, warfarin, clopidogrel or any other drugs which thin the blood and certain types of painkillers, such as ibuprofen, diclofenac, Voltarol and Naproxen. Advice will be given at your pre-surgical assessment.

What are the risks?

As with all types of surgery, DBS involves some degree of risk and the chance of complications.

- There is a chance that the surgery will not benefit you as much as you would like and it is not possible to be certain before the operation how much benefit you will obtain.
- The most serious complication is a 0.3% (1 in 300) chance of a bleed into the brain (stroke) from this procedure. This can result in weakness down one side of the body, speech difficulties or impairment of vision. How much a stroke affects a person is related to the position of the bleed and how severe it is.
- There is a risk of infection in the wounds (about 1 in 50). If treatment with antibiotics does not stop the spread of infection, the whole DBS system may have to be removed.
- It is possible that there could be movement of the electrode. If this occurs, it may need to be replaced. This would mean repeating stage 1 of the procedure.
- There is the possibility of lead fracture (the wire breaking). This would mean repeating stage 1 of the procedure, but may also mean replacing additional parts of the DBS system.
- There is a small risk of the surgery inducing (causing) epilepsy. This risk is less than 1% (less than 1 in 100).
- The risk of death resulting from the operation is very small, at around 0.1% (1 in 1000).

Asking for your consent

Our aim is to make sure that you have enough information to help you make an informed decision about whether to go ahead with surgery or not.

You will have many opportunities to talk with different members of the Movement Disorder Team about any concerns or queries that you may have.

What happens during DBS Surgery?

On the day of surgery you will normally take your usual PD medications. Surgery will be under a general anaesthetic so you should not feel any pain or discomfort.

Initially local anaesthetic will be injected into your scalp at four sites. These will be where pins will temporarily fix the stereotactic (head) frame to your skull.

When your skin is numb four pins will be inserted to fix the frame to your head. They are designed to pierce the skin and screw a few millimetres into the bone.

You will then have a CT (Computerised Tomography) scan which will help us to work out where the electrodes will need to go in relation to the metal frame.

The frame must stay on for the surgery. It is used to hold your head still during the operation and allows the surgeon to pass the wires accurately to the correct position in your brain. It will be removed as soon as the procedure is over.

What happens during stage 1 surgery?

The surgeon will inject some more local anaesthetic into your scalp to numb the skin. You will be asleep and will not feel any pain in your head.

They will then drill a small hole (about 3mm wide) into your skull, on one side on the top of your head. This allows them to put the electrode into your brain at the calculated site. The electrode will be fixed to your skull with a small titanium plate.

Another CT scan will be done to confirm the position of the electrodes. If these are correct, the head frame will be removed.

The whole procedure will take approximately two hours but this does vary from person to person.

After stage 1 of the DBS procedure

One or two wires will be coming out through your skin (depending on which areas of the brain have had electrodes attached). These wires are not the electrodes, they are connecting wires.

If these wires are accidentally pulled, the risk of pulling out the electrodes is very small as they are secured to your skull and scalp.

We will attach these wires to a small external stimulator and test the stimulation for a week before the final decision is made to fully implant the system. We may also make recordings from the electrodes during this time, in order to give us additional information.

What happens during stage 2 surgery?

We will carry out the full implantation the following week. This time the operation is again performed under general anaesthetic (you will be asleep).

The external connecting wires are removed and the electrodes connected to internal connecting leads. These will be attached to an Implantable Pulse Generator (IPG) 'battery' which is normally implanted under the skin just below your collarbone or on your abdomen.

Sometimes we perform stage 1 and stage 2 on the same day. We also occasionally perform the first stage under local anaesthesia and sedation.

The decision about whether this will be done in your case will be discussed with you before your operation.

Will I feel any pain?

You should not feel any pain other than a sensation of discomfort.

What happens after DBS Surgery?

After each operation there may be a cannula in the back of your hand to give you fluids or medication if needed. You will then be taken back to the ward where we will monitor your pulse, blood pressure and wounds regularly. We will offer you regular pain relief.

It is important that you tell a nurse if you are feeling sick or if you have pain so that we can help make you comfortable. It is also important that you change your position in bed at least once

every 2-3 hours to prevent prolonged pressure on individual parts of your body. The nurses will help you if necessary.

When your condition is stable and you are back on medication, you will be allowed to get out of bed. Be careful not to do too much. The next few days should be seen as an important part of your recovery process.

You should be ready for discharge from hospital one day after the second stage of your operation.

By putting the electrodes in position there will often be improvement in your symptoms for a short while, therefore we would not normally switch on the stimulator before you go home.

What do I need to do after I go home?

Once home, after a few days to a week or more, your symptoms will begin to return. You will need to come back to hospital to have the stimulator battery switched on and programmed. An appointment will be given to you before you are discharged.

Occasionally we may decide that we should switch on the stimulator before you go home. We will discuss this decision with you at the time.

Before you go home we will give you a booklet written by the manufacturer about the stimulation system. This explains how the system works as well as “Dos and Don’ts” regarding safety.

Diathermy is the use of a high frequency electronic current used in other routine surgery to produce heat and is often used to relax muscles. **It should not be used if you have had deep brain stimulation.**

MRI scans, a type of brain or body scan, can only be used under very strict conditions.

Antibiotics have to be prescribed when there is a risk of infection getting into the blood stream, for example during dental procedures or surgery.

Most everyday activities are safe, but there are some that could damage the system. You should talk to your specialist about this.

You can travel by plane, but you should inform airport security and carry a card which explains that you have had this type of surgery.

You should also carry the hand-held programmer when travelling. This is in case the stimulator is accidentally switched off.

You will also be given an ID card to carry with you giving details of the stimulator and contact details for the surgeon and your next of kin.

We advise you not to drive for 6 weeks following your DBS surgery. You will also need to take 4-6 weeks off work.

Your scalp stitches will be removed 10-14 days after the operation. This can be done by your GP or practice nurse or during a follow-up visit with us. Your chest stitches are usually absorbable.

You will also be given a leaflet written by the Movement Disorder Team which contains more information about your aftercare and other advice about going home.

By the time you leave hospital we would expect you to be able to care for yourself as you did before the surgery but it may be sensible to make arrangements for help with shopping, housework, gardening and caring for small children.

Will I have a follow-up appointment?

You will stay on long-term follow-up with the Movement Disorder Team.

It is usual to have to change the stimulator settings several times during the months after implantation of DBS. This means you will need further visits to hospital, sometimes with a stay overnight, for us to make the necessary adjustments.

The amount of stimulation needed will change as your brain recovers from the electrodes being implanted.

It is also important for us to reassess the medication you take for PD, as adjustments may be needed when stimulation starts or increases.

The IPG (battery) will last between 3-5 years, depending on the stimulator settings and battery implanted.

It has to be replaced before it runs out. This involves a minor operation to take out the old battery and connect a new one.

There are also rechargeable IPGs available which can last a decade or two and may be beneficial for some people.

We will discuss this option with you before the operation is carried out.

Useful sources of information

PARKINSON'S UK has an information booklet on Surgery for PD

www.parkinsons.org.uk/content/surgery-parkinsons-booklet

Contact us

If you have any questions or concerns about DBS Surgery, please contact us (Monday to Friday, 9am to 5pm)

Consultant Secretaries:

Dr Paviour 020 8725 4627

Professor Morgante 020 8725 2470

Mr Pereira 020 8725 4173

Movement Disorder Nurse: 020 8725 4677

Functional Neurosurgery Service Coordinator: 020 8725 4680

For more information leaflets on conditions, procedures, treatments and services offered at our hospitals, please visit www.stgeorges.nhs.uk

Additional services

Patient Advice and Liaison Service (PALS)

PALS can offer you on-the-spot advice and information when you have comments or concerns about our services or the care you have received. You can visit the PALS office between 9.30am and 4.30pm, Monday to Friday in the main corridor between Grosvenor and Lanesborough Wing (near the lift foyer).

Tel: 020 8725 2453 **Email:** pals@stgeorges.nhs.uk

NHS Choices

NHS Choices provides online information and guidance on all aspects of health and healthcare, to help you make decisions about your health.

Web: www.nhs.uk

NHS 111

You can call 111 when you need medical help fast but it's not a 999 emergency. NHS 111 is available 24 hours a day, 365 days a year. Calls are free from landlines and mobile phones.



Reference: NEU_DBS_01 **Published:** February 2018 **Review date:** February 2020