

Neuro-oncology

Neurosurgery for brain tumours (adults)

Information for patients, relatives and carers

Introduction

This leaflet provides information on surgery for brain tumours and gives an overview of the processes and procedures you may experience.

Neurosurgery is a type of surgery performed on the brain or spinal cord which is performed by a neurosurgeon.

Why is neurosurgery performed for brain tumours?

For brain tumours, surgery can have several different purposes:

- diagnosis of the type of brain tumour
- whole or partial removal of the tumour
- reduction of associated conditions, such as hydrocephalus (a build-up of cerebrospinal fluid which causes increased pressure in the skull)

What types of neurosurgery are performed?

There are different types of surgery performed for brain tumours; this includes:

- biopsy
- craniotomy
- shunt

Biopsy

A biopsy is when a small sample of tumour tissue is taken. This tissue is then analysed under a microscope by a neuro-pathologist.

A biopsy is often used to help give an exact diagnosis of the type of tumour you have. This helps your health team to decide on the best course of treatment for you.

Biopsies may also be used to identify your suitability for certain clinical trials.

The biopsy procedure

- You will have an MRI or CT scan.

This is to provide exact information for the surgeon. Using a computer, the best surgical route into the tumour is determined. This technique is called 'stereotactic' or 'image guided biopsy'

- After the scan we will give you a general anaesthetic before your neurosurgeon drills a very small hole called a 'burr hole' into your skull. You will not be able to feel anything because you will be asleep

- The neurosurgeon will pass a needle through the burr hole and take a small sample of the tumour.

The sample is then sent to the laboratory for analysis

- A burr hole is usually closed by staples or stitches. We will give you information about if and when these need removing

The biopsy itself usually takes around two to three hours.

We may give you steroids to help with any swelling.

Biopsies are not always taken through a burr hole. Biopsies can also be taken during craniotomy procedures.

Craniotomy

It is the most common type of surgery for brain tumour patients and it is usually used to remove all or part of the tumour.

Partial removal also known as 'debulking' or 'partial resection' can help reduce pressure symptoms. It can also sometimes make the remaining tumour cells more responsive to other treatments, such as chemotherapy and radiotherapy.

A craniotomy can be performed when you are awake or when you are asleep.

Awake craniotomy may be performed if the tumour is close to, or involves, areas of the brain that control important functions, such as speech, movement or breathing. The surgeon can map where in the brain exactly these areas are by stimulating them with a tiny electrical probe. They will continue to test these areas throughout the operation by asking you to speak or move to ensure they are working normally.

The aim with this procedure is to remove as much of the tumour as possible, whilst minimising the risks to these functions.

If your team feel an awake craniotomy is the best option for you, they will give you further information and support to prepare for the procedure.

The craniotomy procedure

- If you are having a standard craniotomy, we will give you a general anaesthetic to make you sleep. If you are having an awake craniotomy, you will be put to sleep for the first part of the operation and woken up later. It is important to know that the brain itself has no pain sensors, so you will not feel any pain during the operation
- A small area of your head may be shaved and the area cleaned
- You may be given a local anaesthetic to the part of your scalp that the neurosurgeon will need to cut. This is done to reduce any pain or discomfort after the surgery
- Once the skin has been cut, a section of your skull will be removed; this is called a 'bone flap' and allows the neurosurgeon to reach your brain
- If you are having an awake craniotomy and have been put to sleep for the first part of the operation, you will be woken at this point. This allows your neurosurgeon to map the brain and ensure it is functioning correctly. You may feel some pulling as the neurosurgeon works, but you should not feel any pain
- After your neurosurgeon has accessed your brain, they will remove all or part of the tumour. Often, it is not possible to safely remove the whole tumour; this depends on the position of the tumour
- Once the surgery is complete, your neurosurgeon will replace the bone flap and seal the wound using stitches or metal staples. If you are having an awake craniotomy, you will be put back to sleep before this happens

Any staples or stitches will usually be removed a week or two after surgery, but if you have dissolvable stitches there will be no need for them to be removed.

A craniotomy takes around four to six hours. Although depending on the part of the brain and the tumour's complexity, it could take significantly longer.

Shunts

Another reason you may have neurosurgery is because you need to have a shunt fitted.

Headaches are a common symptom of brain tumours. They can sometimes occur because of a build-up of cerebrospinal fluid (CSF) caused by the tumour. As CSF builds up, the pressure rises, which causes headaches. This build-up of CSF is known as hydrocephalus (or 'water on the brain').

To reduce this pressure, neurosurgeons can insert a tube, called a 'shunt', through your skull and into your brain to drain some of the excess fluid away.

The shunt has valves to ensure that it takes fluid in the correct direction, away from the brain and towards other parts of the body that can easily absorb it, such as the abdominal body cavity. It does not go into your stomach, so does not interfere with how you eat and digest food.

A shunt is not a cure for a brain tumour, but is used to try and improve symptoms related to the increased pressure in your skull.

The length of time that a shunt stays in place varies. If you need to have a shunt for a long period of time, you may have regular check-ups to ensure that it is still working as it should and that it has not become infected. However, regular check-ups are not always necessary once the shunt has been assessed as working well.

A shunt cannot be seen from outside the body, so other people will not know that it is there unless you tell them. You may be able to feel your shunt running down behind your ear.

You may have a 'programmed' or 'variable shunt'. This only allows fluid to drain when the pressure becomes too high. If you have this type of shunt fitted, it is important to know the settings and ensure that when you have any scans done, the imaging department is aware beforehand. You are likely to need MRI scans in future; these scans use a magnet which can have an effect on the shunt setting meaning it will need to be re-set.

Risk of undertaking surgery

Before surgery, a health professional will discuss the operation with you including any risks involved. It is important that you fully understand these risks, so you can make an informed decision about whether or not to have surgery. The risks will vary depending on the procedure but any brain surgery does carry risks, some of which are serious. You should ask as many questions as you need in order to make an informed decision.

How will I feel after surgery?

Many factors will influence how you feel after surgery, including:

- the type of surgery you have had
- the size of the tumour
- the location of the tumour

When you first wake up after brain surgery, you may have some swelling and bruising on your face. The symptoms you had before surgery may temporarily become worse. This is not unusual and is caused by the swelling in the brain after surgery.

You may experience some or all of the following temporary symptoms:

- vomiting or nausea from the anaesthetic (we can give you anti-sickness and pain relief tablets to reduce this)
- sore throat from the breathing tube used during the surgery
- headaches caused by some swelling in your brain. The swelling should settle within a few days; pain relief can be used to help relieve the headaches
- episodes of feeling dizzy or confused
- Difficulty swallowing. You may need to have your swallowing checked by a speech therapist before you are allowed to eat or drink

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- new symptoms which may improve, might include:
 - personality changes
 - poor balance and co-ordination
 - speech problems
 - weakness
 - epileptic seizures (fits)
 - You may feel tired

It is important to remember that these symptoms usually disappear fairly soon after surgery and that a team of health professionals will be taking care of you.

Before surgery, your consultant will discuss with you what to expect. Please make sure you ask all the questions you have before the surgery.

How long will it be before I am back on my feet?

Neurosurgery is a major operation and you will need to rest for a number of days afterwards.

For the first few days, it is important that the pressure in your head does not increase; your healthcare team will be carefully monitoring this. Nurses will check you are lying in a suitable position, moving your arms and legs enough to allow blood flow and prevent thrombosis (blood clots) and ensuring your muscles don't stiffen.

We will discharge you from hospital once you are medically fit, but you may need some additional support at home.

Wound care

On the ward we will advise you about:

- when your stitches/staples need to be removed
- whether your stitches/staples should be removed by the GP or in hospital
- When you should wash your hair (normally we would suggest using a mild shampoo to avoid irritation. When washing your hair for the first time the water may look brown/red from the cleaning solutions used during surgery)

We will check your wound at your first outpatient clinic appointment after the operation. If you have any concerns about your wound before then please contact your specialist nurse for advice.

How will I know if the surgery has been successful?

You are likely to have a brain scan a few days after surgery. This will give your healthcare team a good idea about whether any of the tumour remains and how much swelling of the brain there is.

Will surgery cure my tumour?

Before surgery, your consultant will discuss with you what the aim of the surgery is and whether they are attempting to remove all or just part of the tumour.

Often, surgery is not a cure but removing part of the tumour can make the remaining tumour cells more responsive to other treatments, such as radiotherapy and chemotherapy.

I've had brain surgery – what's next?

Your consultant should talk through your treatment plan with you so that you know what to expect. After brain surgery, you may need to have other treatment, such as chemotherapy or radiotherapy.

It is common to be given steroids to help reduce post-operative swelling and minimise the pressure in your head. You will most likely be prescribed a steroid called Dexamethasone. Under the guidance of your consultant, you should be able to gradually stop taking steroids.

Some people experience seizures (or 'fits') before or after brain surgery caused by either the position of the tumour or increased pressure in the head. We may give you anti-epileptic medication as a preventative measure. The length of time you will need to take this medication varies, but it is not uncommon to have to take anti-epileptics long-term.

Will my hair grow back?

If you have had an area of your hair shaved before surgery, it will normally grow back.

Will I be able to fly after brain surgery?

Please speak to your healthcare team. Normally, you will not be able to fly for four to six weeks after neurosurgery.

Travel insurance can be expensive or more difficult to get cover for following neurosurgery but there are some specialist insurers who may insure you to travel, the Maggie's Centre have a list of these.

Will I be able to play sport after brain surgery?

Please seek advice from your doctor.

Once you have fully recovered from surgery, there should be no reason not to take part in sports, although it is recommended that you avoid contact sports (those with significant physical contact between players), such as rugby and football.

Your healthcare team will be able to advise you on when you can begin playing sport again.

Are there any long-term side effects of surgery?

Long-term side effects or difficulties after surgery can happen. Nerves or the brain itself can be damaged during surgery which can affect the particular function that they control within the body. The result of this damage is sometimes called a 'deficit'.

A deficit can be permanent or temporary. Even if it is temporary it can take months or years to fully recover from a deficit. It can include problems with speech, movement or difficulties in thought processes.

If this happens to you, professionals, such as speech and language therapists, occupational therapists, physiotherapists and clinical psychologists, can work with you to improve these functions. Do not be afraid to ask for additional support if you feel you need it.

What if I am told I can't have surgery?

Whether neurosurgery is possible often depends where the tumour is positioned. Sometimes, it would be too risky to operate as the tumour may be very close to, or wrapped around, an important structure in the brain. In these cases any benefit of surgery would be outweighed by the risks.

If your consultant does not think surgery is appropriate for you, this will be discussed when the consultant outlines the treatment options explaining why surgery is not possible. . This is so you can understand why it is not being advised in your situation. If you are still unhappy or unsure about their decision, you can ask for a second opinion from another consultant. Your current consultant or GP can help to arrange this.

How to contact us

Imperial College Healthcare NHS Trust has a **Macmillan navigator service**, which can answer questions on behalf of the relevant clinical nurse specialists (CNSs). Navigators, will also refer you to CNS teams, and to other specialist clinical staff, as needed. The service is available Monday to Friday 08.00–17.00.

Telephone: **020 3313 0303**

Outside of these hours, please contact your GP or phone NHS 111.

Further sources of support and information

Macmillan Cancer Support Helpline: **0808 800 000** (Monday to Friday, 09.00-20.00)
www.macmillan.org.uk

Macmillan Cancer Information and Support Service at Charing Cross and Hammersmith hospitals

The information centre at Charing Cross Hospital and the Infopod at Hammersmith Hospital provide support, practical and signposting advice to anyone affected by cancer. These drop-in services are set in friendly, non-clinical environments in which people affected by cancer can discuss private and emotional needs.

The centre is located on the ground floor of Charing Cross Hospital, telephone: **020 3313 0171** and is open (except bank holidays):

- Monday, Tuesday, Wednesday and Thursday 08.00-17.00
- Friday 09.00-17.00 (Volunteer only)

The Infopod is located on the ground floor of the Garry Weston Centre at Hammersmith Hospital, telephone: **020 3313 4248** and is open (except bank holidays):

- Monday and Tuesday 09.00-17.00
- Wednesday, Thursday, Friday 09.00-16.00

Maggie's Cancer Caring Centre

Maggie's is a cancer charity that provides the emotional, practical and social support that people with cancer may need. The centre combines striking buildings, calming spaces, professional experts offering professional support, and the ability to talk and share experiences with a community of people who have been through similar experiences. Designed by leading architects, Maggie's centres are warm, friendly and informal places full of light and open space with a big kitchen at their heart. Maggie's West London is located in the grounds of Charing Cross Hospital but is independent of our hospital. The centre is open Monday to Friday, 09.00-17.00. For more information please call 020 7386 1750.

How do I make a comment about my visit?

We aim to provide the best possible service and staff will be happy to answer any of the questions you may have. If you have any **suggestions** or **comments** about your visit, please either speak to a member of staff or contact the patient advice and liaison service (**PALS**) on **020 3313 0088** (Charing Cross, Hammersmith and Queen Charlotte's & Chelsea hospitals), or **020 3312 7777** (St Mary's and Western Eye hospitals). You can also email PALS at **imperial.pals@nhs.net** The PALS team will listen to your concerns, suggestions or queries and is often able to help solve problems on your behalf.

Alternatively, you may wish to complain by contacting our complaints department:

Complaints department, fourth floor, Salton House, St Mary's Hospital, Praed Street
London W2 1NY

Email: **ICHC-tr.Complaints@nhs.net**

Telephone: **020 3312 1337 / 1349**

Alternative formats

This leaflet can be provided on request in large print or easy read, as a sound recording, in Braille or in alternative languages. Please email the communications team:
imperial.communications@nhs.net

Wi-fi

Wi-fi is available at our Trust. For more information visit our website: www.imperial.nhs.uk

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