Image-guided biopsy for a brain tumour

We have given you this factsheet because you are due to have a procedure called an image-guided biopsy to help diagnose a tumour or suspected tumour in your brain. It explains what an image-guided biopsy is and what the procedure involves so you know what to expect. We hope it helps to answer some of the questions you may have. If you have any further questions or concerns, please contact us using the details at the end of this factsheet.

What is an image-guided biopsy of a brain tumour?

A biopsy is a procedure that can help to diagnose conditions. It involves a neurosurgeon (a doctor specialising in disorders affecting the central nervous system (brain and spinal cord) and the peripheral nervous system) taking small samples from a tumour or suspected tumour in the brain using a needle. These samples are then tested to determine the type of tumour and how quickly it is growing (its 'grade').

An 'image-guided' biopsy involves using CT or MRI scans to help precisely locate and target the tumour or suspected tumour in the brain. In the past, this procedure was often done by fixing a metal frame to a person's head with pins and then carrying out a CT or MRI scan with the frame on (known as a 'frame-based stereotaxy'). However, it is now possible to perform the CT or MRI scan as a separate procedure (without a frame on) before the biopsy. The data from the scan is then uploaded onto a computer in the operating room and used alongside a navigation system to locate the tumour. This newer approach is known as 'frameless stereotaxy' or 'image-guidance'.

Why do I need an image-guided biopsy?

We usually perform an image-guided biopsy because your previous scans have shown a tumour or lesion (damaged area) in your brain. Unfortunately, these previous scans are only about 60 to 70% reliable in diagnosing different types of tumours within the brain. We need to do a biopsy to be certain of the diagnosis so that we can plan the best treatment for you and give you more accurate information on your prognosis.

What are the risks of an image-guided biopsy?

An image-guided biopsy is generally a safe procedure, but as with any surgical procedure there are some possible risks and complications.

Overall, complications are rare, and the degree of risk depends on a number of factors, such as:

- the location and type of tumour
- your general medical health
- your age

Your neurosurgeon will explain to you the particular risks associated with your procedure and give you an indication of the likely chance of complications occurring.

Complications include, but are not exclusive to, the following:
- temporary or permanent neurological deficit (stroke, such as paralysis of limbs or loss of speech)
- haematoma (blood clot)
- brain swelling
- infection
- fits

Some of these complications might be serious enough to need further surgery and some can be life threatening. Overall, as a general guide, the risk of serious complications causing severe permanent neurological deficit (stroke) or death is about 1%.

How successful is an image-guided biopsy at providing a diagnosis?

Very occasionally, in about 1% of cases, the tiny samples of tissue will not be enough to give a definite diagnosis, and we may need to repeat the procedure.

Some primary brain tumours (tumours that start in the brain) may not be the same all the way through, so there is a chance that a small biopsy may not be fully representative of the whole tumour. This could lead to the tumour being incorrectly graded (too low). We try to avoid this sampling error by taking several biopsies from different locations from the tumour and by targeting the most abnormal areas on the scan.

How should I prepare for the procedure?

Clinic appointment

Before your procedure, you will have either a face-to-face or telephone clinic appointment with your neurosurgeon.

During this appointment, your neurosurgeon will explain:
- why you need this procedure
- what the procedure involves
- the benefits and risks of the procedure
- alternative treatments or management options

If you are happy to go ahead with the procedure, we will ask you to sign a consent form either at this appointment or on the day of your procedure.

Pre-assessment appointment

We will invite you to attend a pre-assessment appointment at the hospital.

During this appointment, we will:
- explain the procedure in detail
- answer any questions you may have
- perform any necessary tests
- advise when to stop eating and drinking before the procedure
- advise if you need to stop taking any medications before the procedure

CT or MRI scan

You will have a CT or MRI scan before your image-guided biopsy. You will be contacted by the relevant healthcare team about this.

For more information about having either of these scans, please see the ‘Useful links’ section at the end of this factsheet.

What will happen before the procedure?

When you arrive for your procedure, we will ask you to change into a hospital gown and remove any jewellery.

Sedation

You do not usually need to have a general anaesthetic (medication that sends you to sleep) for this procedure, but we will give you some sedation (medication that makes you drowsy) to ensure you are relaxed and comfortable throughout the procedure. An anaesthetist (a specialist doctor) will meet with you before your procedure to explain what having sedation involves and the benefits and risks.

The anaesthetist will then insert a cannula (a thin, plastic tube) into a vein in your hand or arm to give you the sedation.

What will happen during the procedure?

The procedure will be performed by a neurosurgeon in an operating theatre.

Once the sedation has taken effect, we will position you on an operating table with your head supported on a headrest. We will use a neuronavigation system (like a satellite navigation system) and data from your CT or MRI scan to precisely locate the site for the biopsy (target) and to determine an entry point. We will then mark this point on your scalp.

We will shave a small amount of hair and then clean the area on your scalp with some antiseptic solution. We will then place surgical drapes around the area. We will then inject a small amount of local anaesthetic to numb the area. This will sting briefly for a few seconds before going numb. You should not feel any pain or discomfort for the rest of the procedure, but you may feel some pressure or movement on your head. If you experience any discomfort or pain during the procedure, please let us know.

Once the area is numb, we will make a small incision (cut) on your scalp. We will then use a special drill to create a small hole in your skull approximately 14mm in diameter. This part of the procedure is a bit noisy, but it should only last for a few seconds. We will then screw a small device to the edges of bone around the hole to hold the biopsy needle in position. Using the navigation system, we will plan the route for the biopsy needle. We will then guide the biopsy needle into the tumour and take a series of biopsies (small samples of tissue usually about the size of a grain of rice) of the tumour. We will then remove the needle and close the wound with stitches and staples for the skin.

How long will the procedure take?

The procedure will usually take 30 to 40 minutes.

What will happen after the procedure?

We will move you to our recovery area for a short time and then to our neurosurgery day case unit where we will monitor you closely to make sure you are recovering well.

During this time, we will:
- assess your conscious level (we will ask you to follow simple instructions, open your eyes and answer questions)
- examine your pupil responses
- test your limb strength
- measure your pulse, blood pressure and respiration rate

You may experience a headache as the local anaesthetic wears off. We will give you pain relief medication to help ease any headaches. You may also feel sick (nauseous). If this is the case, we will give you medication to help relieve this.

You can eat, drink and move around as soon as you feel able to, which is usually within a few hours of the procedure.

We will arrange for you to have a CT scan of your head four hours after your procedure. If the scan looks fine and you feel well, you will usually be able to go home (or back to your local hospital if you are an inpatient) six hours after your procedure. Occasionally, it may be necessary for you to stay in hospital for longer for observation. We will advise you when it is safe for you to leave hospital.

We will often prescribe you a course of steroids (in a slowly reducing dose) to prevent swelling and anti-epileptic medication to prevent fits for a short time after your procedure. We will discuss this with you in more detail before you leave hospital.

What should I expect after I leave hospital?

Follow-up appointment

We will arrange a telephone follow-up appointment for you with your neurosurgeon usually a week after your procedure.

At this appointment, we will discuss the results of your biopsy and any plans for further treatment or follow-up care.

Side effects

After the procedure, it is normal to:
- have some mild headaches (these will lessen with time)
- feel tired (this can last for a number of weeks)

Wound care

You will need to keep your wound clean and dry until the staples have been removed. Staples are usually removed by your GP practice nurse a week after your procedure, but we will advise you of exact timings and how to arrange this before you leave hospital. You will be able to wash your hair once the staples have been removed.

If you have any concerns about your wound (for example, redness or discharge (leaking of fluid)), please contact our neuro-oncology nurse specialist team for advice immediately using the details at the end of this factsheet.

Medication
If you have been prescribed steroids, you will need to slowly reduce the dose as instructed by your neurosurgeon.

If you have not had any fits, your neurosurgeon will advise if you can stop taking the anticonvulsant medication. Do not stop taking any medication without discussing it with your neurosurgeon first.

If you have any concerns about your medication(s), please contact the neuro-oncology nurse specialist team.

Driving
You will not be able to drive after your procedure. When you will be able to resume driving will depend on your symptoms and diagnosis. You will need to inform the Driver and Vehicle Licensing Agency (DVLA) of your diagnosis and give them the name of your treating neurosurgeon. You can do this online or by calling the DVLA on **0300 790 6806**. The DVLA will send a form to your neurosurgeon for them to complete and will then inform you of the date on which you may resume driving.

For more information or to contact the DVLA, please visit:
www.gov.uk/driving-medical-conditions

Activities
Due to the small risk of a fit, you should avoid any activities that may put you at risk if you were to suffer a brief loss of consciousness (for example, climbing ladders, operating certain machinery or swimming unsupervised).

Will my symptoms improve?
No. The aim of the procedure is to get a diagnosis so that we can plan your future treatment and give you an indication of your prognosis.

When should I seek medical help?
If you are still in hospital, let a member of the team caring for you know if you experience:
- headaches that are getting progressively worse
- persistent vomiting
- fitting
- a fever (a high temperature of 38°C or above)
- wound problems (for example, increasing pain, swelling or discharge)
- development of new or worsening symptoms (such as weakness or numbness)
- increasing drowsiness
- a rash

If you experience any of the symptoms above after leaving hospital, contact your general practitioner (GP) or our neuro-oncology nurse specialist team using the details below.

Outside of working hours, contact NHS **111** for advice.

In an emergency, go to your nearest emergency department or call **999** for an ambulance.

Contact us

If you have any questions or concerns, please contact us.

Neuro-oncology nurse specialist team
Telephone: **023 8120 4071** (Monday to Friday, 9am to 4pm)

Useful links

www.uhs.nhs.uk/departments/radiology-scans-and-imaging/patient-information/ct-scan

www.uhs.nhs.uk/departments/radiology-scans-and-imaging/patient-information/mri-scan

If you are a patient at one of our hospitals and need this document translated, or in another format such as easy read, large print, Braille or audio, please telephone **0800 484 0135** or email **PFSH@uhs.nhs.uk**

For help preparing for your visit, arranging an interpreter or accessing the hospital, please visit **www.uhs.nhs.uk/additionalsupport**

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