

# Symptoms and diagnosis

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Information sheet 01

## Brain tumour symptoms

### Introduction

Brain tumours are rare, so it is unlikely that you have one – even if you have all of the symptoms. There are many other things that could be causing your symptoms, most of which are harmless. However, if you are worried it is important to go and see your GP as soon as possible. Your GP may refer you to a specialist doctor who will explore your symptoms in detail.

Our information on brain tumour symptoms will help you talk to your doctor or medical team about your condition. It should not be used as a substitute for professional care.

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### What are the symptoms of a brain tumour?

Doctors talk about symptoms and signs.

- Symptoms are abnormal changes you may have noticed about yourself.
- Signs are what other people may have noticed about you. For example, you have become more forgetful, or you need to sleep more.
- Your symptoms will depend on how big your brain tumour is, where it is, what grade it is and how fast it is growing. Symptoms that might suggest a brain tumour include:
- **Headaches:** Headaches which are worse in the morning and may wake you at night. They are usually different from headaches you may have had before.
- **Nausea and vomiting:** If you also have a headache, being sick could mean there is increased pressure in your head (intracranial pressure).
- **Seizures:** Epileptic seizures are caused by a disturbance in the electrical activity of the brain. They always start in the brain.

What happens to the person during the seizure depends on where in the brain this disrupted activity happens.

- **Weakness, loss of sensation or numbness:** This could be a sign of pressure on a specific part of the brain and can also cause you to walk unsteadily, lack coordination or have muscle weakness on one side of the body.
- **Hearing loss:** This could be a sign of an acoustic neuroma, a benign tumour growing on a nerve in the ear.
- **Loss/disturbance of vision, including double vision:** This could happen in one or both eyes, if there is a tumour pressing on the optic nerve or affecting the visual pathways.

- **Speech difficulties:** This may also include the loss of the ability to write or understand words.
- **Other symptoms:** Lack of concentration, confusion, memory loss, disorientation, drowsiness, dramatic change in behaviour.

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## What causes the symptoms?

Brain tumours cause symptoms in two ways, either because the space it takes up in the skull puts pressure on the brain, or because of where in the brain it is growing.

### **Symptoms caused by increased pressure in the skull:**

The first way in which brain tumours can cause symptoms is by increasing the pressure inside the skull.

The brain is housed within the skull and has a limited amount of space. If a tumour grows in the brain it can cause an increase in pressure, which can cause symptoms to develop.

An increase of pressure in the skull is called raised intracranial pressure (ICP).

Early symptoms of a rise in the pressure in the brain are headaches and feeling sick.

Of course, many other things can cause headaches or feelings of sickness, but if you have either of these for over a week with no sign of getting better, you should see your doctor.

A pressure headache may be at its worst in the mornings, and can sometimes even wake you at night. Usually this type of headache gets better during the day. However, it may get worse when you cough, sneeze, bend down or do any hard physical work, because these activities raise pressure in the brain.

If the pressure in the brain makes you sick, it may be worse in the morning. You may be sick if you have hiccups.

A later symptom of a brain tumour is drowsiness. This can happen as the pressure in the brain increases. You may find that you sleep more or that you fall asleep during the day.

Raised pressure in the brain can also cause changes to your vision, such as blurred vision, 'floating objects' and tunnel vision. It may also make you confused or affect your balance.

### **Seizures:**

Epilepsy is another common symptom caused by brain tumours.

Epileptic seizures are caused by a disturbance in the electrical activity of the brain.

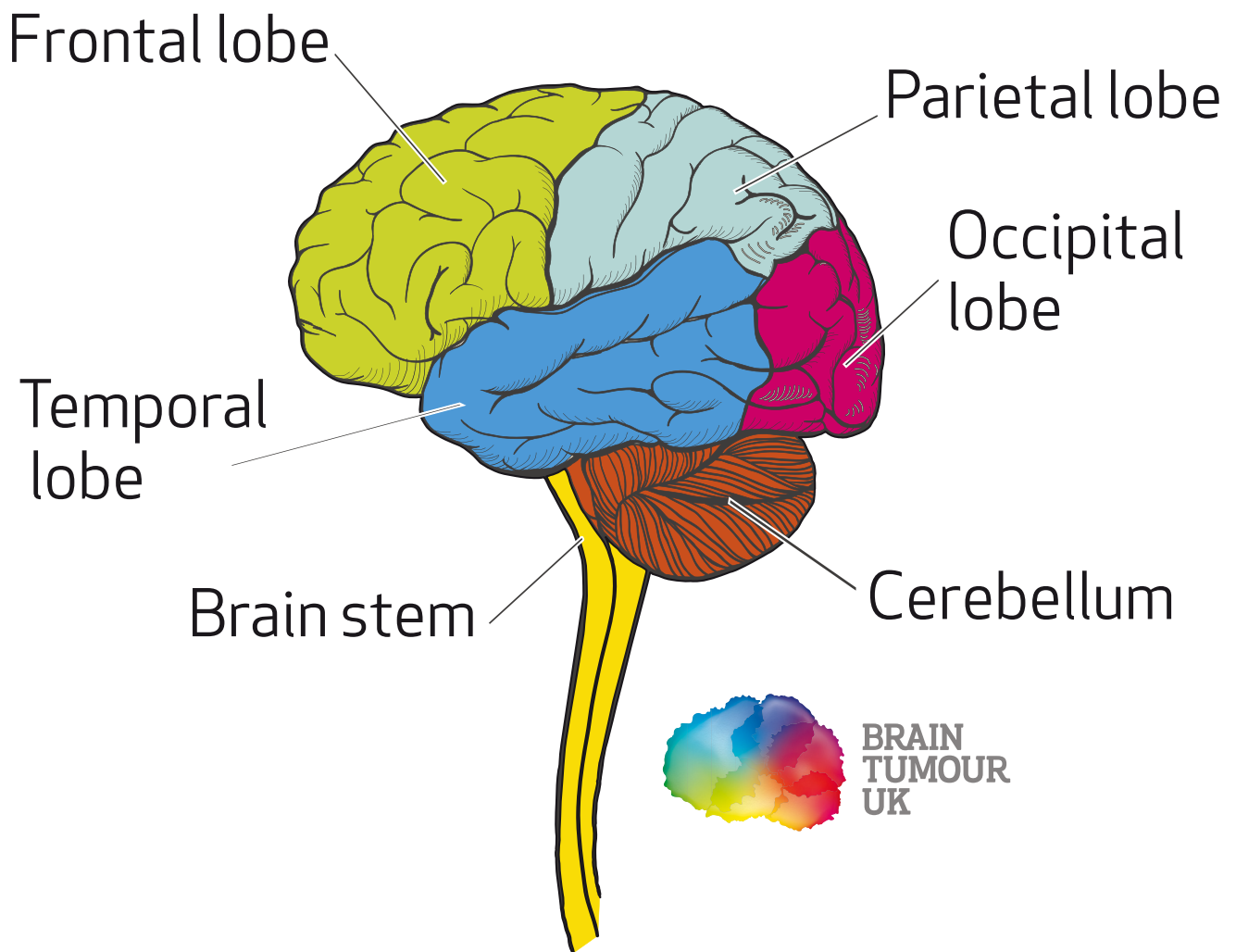
What happens to the person during the seizure depends on where in the brain this disrupted activity happens.

A seizure does not necessarily mean you have a brain tumour, but it is important to see a doctor to find out what has caused it so that the cause can be treated.

### **Symptoms caused by the tumour's position in the brain:**

Some symptoms can happen because the brain tumour is pressing onto or growing into other nearby tissues of the brain. Each area of the brain controls certain functions. A tumour may stop a particular area of the brain from working normally.

What symptoms you have will depend on exactly where the tumour is and how much damage it is causing.



Some of the symptoms are listed below, but remember this is only a guide. Only a doctor can make a diagnosis using medical tests.

- **Frontal lobe tumours** – Changes in personality and intellect. Uncoordinated walking or weakness of one side of the body. Loss of smell, difficulty in understanding words or speaking.
- **Parietal lobe** – Difficulty in speaking or understanding words. Problems with writing, reading or doing simple calculations. Difficulty in coordinating certain movements, and finding your way around. Numbness or weakness on one side of the body.
- **Occipital lobe** – Gradual loss of vision on one side.
- **Temporal lobe** – Seizures, which may cause strange sensations: a feeling of fear or intense familiarity (déjà vu), strange smells or blackouts. Speech difficulties and memory problems.
- **Cerebellum** – Lack of coordination when walking and talking (dysarthria), unsteadiness, flickering movement of the eyes (nystagmus). Vomiting and neck stiffness.
- **Brain stem** – Unsteadiness and an uncoordinated walking. Facial weakness, a one-sided smile or drooping eyelid. Double vision. Vomiting, difficulty in speaking and swallowing. Symptoms may appear gradually.

All the above symptoms may be caused by conditions other than a brain tumour, but if you do have any of the symptoms it is a good idea to see your doctor to find out what is causing them.

It is important to note that some brain tumours do not cause any symptoms at all for a long period of time. Symptoms are more likely to develop early on in high-grade tumours and more gradually with benign or slow-growing tumours. However, this is not always the case.

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# Diagnosis

## How is a brain tumour diagnosed?

Usually, if you have a tumour which has developed over a long time, you will see your GP, who will examine you.

If your GP suspects you may have a brain tumour, they will refer you to a specialist doctor – a neurologist (a specialist in brain and nerve problems) or an oncologist (a specialist in cancer treatment).

Sometimes, a brain tumour may cause a sudden epileptic seizure or other sudden problem because of where the tumour is in your brain. In this case, you may be taken straight to hospital where tests will be carried out to find out whether you have a tumour or what else has caused the problem.

The doctors or specialists can do a series of tests to find out whether you have a brain tumour. They will choose the best tests for your set of symptoms. The tests may include:

- checks to see if your brain and nerves are working normally - a neurological examination;
- blood tests;
- scans and X-rays;
- tests with special monitors;
- an operation to take a sample of cells - a surgical biopsy.

### Answering questions about your health

The first thing the doctor at the hospital or your GP will do, is ask you detailed questions about your symptoms, your general health, your past health, and your family's health.

### A general physical check-up

You may also have a general physical check-up at this point. The doctor may listen to your chest, and examine your breasts, tummy (abdomen) or back passage (rectum) to make sure there are no obvious signs of cancer somewhere else in your body.

### Neurological examination

This is a series of tests to see if your brain, nerves and other functions controlled by the brain are working normally.

This will include:

- Mental exercises, such as simple arithmetic and testing your memory;
- Looking into your eyes, shining a light at your eyes to see if your pupils react and testing your eye sight;
- Hearing tests;
- Face muscle tests such as smiling and grimacing;
- Tongue and swallowing - checking tongue movement and your swallow (gag) reflex;
- Strength and movement, including checking the strength of your arms and legs, your knee jerks and other reflexes;
- A test of your ability to feel pinpricks on areas of skin, to tell the difference between hot and cold, and possibly to recognise the feeling and shape of familiar objects like coins;
- Checking your balance and coordination, for example by asking you to walk a few steps or perform repeated movements.

### A blood test

The nurse at your GP surgery may do this or you may be asked to go to your local hospital. They will take a small sample of blood using a syringe from a vein in your arm. This is a very quick and harmless test that can pick up many common problems in the brain or elsewhere in the body.

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In the same way as a detective puts together all the clues, each of these steps will help to build a better picture of what is happening inside your brain.

### **At the hospital**

If the GP thinks that you may have a tumour or even if he or she finds nothing wrong but your symptoms suggest you may have a tumour, your GP may refer you to a specialist.

This means that you will get an appointment to see a specialist in an outpatient clinic at a hospital. This is where hospital doctors see patients who are not staying at the hospital.

You should see someone within two weeks.

It will usually be a neurologist, who is someone that specialises in brain and nerve problems.

However, your GP might also ask you to see a specialist if they think that you have a different problem. In this case, it may take longer than two weeks.

If your GP does not send you off to have further investigations, it is because they do not think that something is wrong, based on what they have seen.

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## **When should my GP refer me to a specialist?**

It is not always easy for a GP to decide who may have a brain tumour. Less than one in every 100 people suffering from headaches has a brain tumour.

The National Institute for Health and Clinical Excellence (NICE) has drawn up guidelines to help doctors decide who to refer to a specialist.

NICE says you need urgent referral within two weeks if you have these symptoms:

- If you have headaches (especially in the morning) while also feeling drowsy or being sick, having blackouts or changes in personality and memory;
- New symptoms linked to your brain and nerves that are getting worse, such as fits, mental changes, deafness on one side, double vision, weakness of an arm or leg, or loss of feeling in part of the body;
- Unexplained sudden seizures either affecting the whole body or just one part, such as jerking or twitching in a hand, arm or leg;
- Changes in behaviour, mental abilities or personality that are getting worse quite quickly.

The guidelines say that your doctor should consider referring you to a specialist urgently if you have started having recent headaches (but for at least a month) which are not migraines.

But this is only if you have other symptoms that suggest you may have increased pressure in your head.

This raised intracranial pressure may include being sick, being woken by a headache or a headache that gets worse or better depending on your position. If you have persistent headaches that do not come on with other symptoms, your GP may think about discussing your case with a specialist or making a non-urgent referral for you.

If you are drowsy, your GP should refer you to a specialist immediately.

Headaches can often be part of a chronic condition such as depression, or caused by stress. NICE advises the GPs to use their judgement. If you have been having the same symptoms on and off for years, have had them investigated and have been found not to have cancer or a brain tumour, your GP should not be expected to refer you as an urgent case each time your symptoms come back.

According to Department of Health guidelines, you should ideally get an appointment within two weeks for an urgent referral.

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# Diagnosis with scans and X-rays

A specialist doctor may ask you to have one or more scans to help explain your symptoms. If you have a brain tumour, a scan may show what kind of tumour it is and help your doctors decide on the best treatment for you. You are most likely to have one of two types of scan.

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## Computed Tomography (CT scan)

### How does it work?

This method uses X-rays that are taken from many different directions and angles. This makes it possible for the computer to create detailed pictures of your brain. It will produce a series of pictures that represent what each layer of your brain looks like.

### How do I prepare for the scan?

You may be asked not to eat or drink for some time before the scan. You will have to take off any jewellery as it may interfere with the scan and you may be asked to undress or put on a hospital gown.

### What will happen?

You will have to go to the hospital to have your CT scan. The radiographer will explain the procedure. This is a good time to ask any questions.

The CT machine looks like a big doughnut with a hole in the middle and a couch in front of it for you to lie on. The couch moves in and out of the tunnel so that lots of pictures can be taken from different angles.

The doctor may want to scan other parts of your body, including your chest, stomach, or spine. This is to see if there are any other abnormalities or to find out if your tumour could have spread from cancer in another part of the body.

The scan takes about 30 minutes, although a lot of this time is spent setting it up so that you are in the right position. You will be asked to lie as still as possible throughout the scan.

You will be able to talk through an intercom to the radiographer during the scan. You will normally be allowed to go home after the scan.

An appointment will be made to discuss the results later with your specialist.

### What will it feel like in the tunnel?

CT scans are not noisy, painful or dangerous.

However, some people find being in the tunnel a bit claustrophobic (closed in). If you think this might happen to you, it is best to tell the radiographer first.

If you worry you will not be able to keep still, talk to your doctor in advance and they may be able to give you some medicine to help you relax.

In some cases, a dye may be injected into your vein before the scan. This contrast medium helps to show the outline of the tumour more clearly. The dye only remains in your blood for a short period of time before being removed by the kidneys.

### What are the pros of having a CT scan?

CT scans are capable of picking up most tumours. They are more widely available in hospitals so it may be possible for you to have one done quite quickly.

### What are the risks of having a CT scan?

You are exposed to a quite a lot of radiation during the scan.

It is not enough to do you harm, but the doctors will not offer it to you unless the doctor thinks there is a good chance that you have a brain tumour.

However, if you are asked to have a CT scan, it is because doctors have decided the benefits are bigger than the risks.

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It will help them decide on and start treatment as soon as possible.

A few people are allergic to the contrast dye injected before the scan. The specialists are aware of this and will be able to treat you if you are affected.

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## Magnetic Resonance Imaging (MRI)

### How does it work?

MRI is a scan using magnetism to build up a picture of the inside of the head.

The scanner will almost certainly show up a brain tumour. It will show up clearly each different type of tissue within the brain so it can give some idea about what a tumour is made of.

To show or hide more about an MRI scan, [click here](#).

### What will happen?

You will have to go to the hospital to have your MRI scan. The radiographer will explain the procedure and you should ask them any questions you may have.

The MRI machine looks like a tube with a couch in front of it for you to lie on. The couch moves in and out of the tunnel so that lots of pictures can be taken from different angles inside the tube. The doctor may want to scan other parts of your body, including your chest, tummy (abdomen), or spine. This is to see if there is anything abnormal or to find out if the tumour has spread from some other part of the body.

The procedure may take between 30 and 90 minutes. You will be asked to lie as still as possible throughout the scan to get accurate images. You will be able to talk through an intercom to the radiographer during the process. You will normally be allowed to go home after the scan. An appointment will be made to discuss the results later with your specialist.

### How do I prepare for the scan?

You will have to take off any jewellery and you may be asked to undress or put on a hospital gown.

The radiographer will ask you lots of questions to ensure that you do not have any metal inside your body as metal will affect the scan.

For instance, a pacemaker, a contraceptive coil (IUD), cochlear implant (hearing aids), or metal plates or pins that were put in during previous operations. You will not be allowed to have an MRI if you have any of these metal implants as metal interferes with the machine.

Having an MRI is not harmful or painful. However, they do make a very loud noise. You may be able to listen to some music through headphones. Bring your own music in case it can be used. Keeping your eyes closed may help you to relax.

Some people find being in the tunnel claustrophobic (closed in). If you think, this may happen to you, it is best to tell the radiographer before.

If you worry you will not be able to keep still, talk to your doctor in advance and they may be able to give you some medicine to help you relax.

You may be asked not to eat or drink for some time before the scan.

In some cases, a dye called gadolinium is injected into your vein before the scan. This contrast medium helps to see the outline of the tumour more clearly. The dye only remains in your blood for a short period of time before being removed by the kidneys.

### What are the pros of having an MRI scan?

Unlike CT scans, MRI does not use any radiation. This makes it safer for children and pregnant women. MRI is better than CT scans at picking up small tumours and those that are at the back or base of the brain.

They show more clearly how far the tumour has grown into other tissues as well as being able to see the tumour from many angles. This helps to plan the best way to remove it surgically.

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## What are the cons of having an MRI scan?

It is more expensive and there is a longer waiting list to use MRI scanners. They are noisy and the process often takes longer.

## What is the risk of having an MRI scan done?

MRI is very safe, as long as there are no metal implants in your body.

A few people are allergic to the dye injected before the scan.

The allergic reaction most often starts with sweating, a rash and difficulty with breathing. The specialists are aware of this risk and will know what to do if this does happen.

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## Abdominal ultrasound and chest X-ray

Your doctor may ask you to have a scan of your tummy (abdomen) and a chest X-ray.

The scan and X-ray are to check whether you have cancer anywhere else in your body.

In adults, secondary cancer is cancer which started in another part of the body. Secondary brain cancer is much more common than primary cancer that starts in the brain itself.

Ultrasound uses sound waves to build up a picture of the area being scanned. It is completely painless and only takes a few minutes.

X-rays use radiation to take a picture of the body. The amount of radiation is quite small and fairly safe. But radiation can be harmful so doctors will try to keep the number of X-rays that you have to as few as possible. The amount of radiation your body absorbs depends on the type of X-ray used and which part of the body is involved.

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## PET scan

PET stands for Positron Emission Tomography. This is a fairly new type of scan to show up where the tumour is. It is only available at a few hospitals. If your specialist wants you to have a PET scan, you may have to travel to another hospital.

You will be given a small amount of mildly radioactive glucose through an injection (usually in the arm). The small amount does not harm you. The scanner traces the glucose as it spreads through your body. Sometimes, the scan is combined with a CT scan or X-ray to create a 3-D view of the glucose in your body.

The brain uses up the glucose and the scan measures how quickly this happens. The tumour normally absorbs more of the glucose and the extra radioactivity in the tumour shows up on the scan. A PET scan may help to tell whether a tumour is growing and whether it is cancerous (malignant) or benign.

After the injection is given you may be asked to lie in a dark room with your eyes closed. You will then be taken to the scanning room and asked to lie on a couch with the scanning ring around you.

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## SPECT scan

SPECT stands for Single Photon Emission Computed Tomography. It is similar to a PET scan, but uses much simpler equipment to get information about chemicals in the brain tumour.

You will be given an injection of a very small amount of a radioactive chemical. This is really a tiny amount and does not harm you. The radioactive chemical circulates in your blood to your brain and shows up the brain tumour on the scanner.

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# Diagnosis with a biopsy

An operation is the only way to diagnose many brain tumours. A surgical biopsy is when a small portion of the tumour is removed during an operation, so that doctors can look at the tumour cells under a microscope.

The size, shape and other changes in the cells help doctors identify the type and grade of brain tumour.

For some brain tumours, a biopsy is the first part of an operation to remove all or part of your tumour.

For other brain tumours, you may just have a biopsy and then go on to have other treatments such as radiotherapy.

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## Standard biopsy

### How is it done?

The biopsy should not take more than a couple of hours but you will probably have to stay at least one night at the hospital.

You will first have to have a CT or MRI scan so that your surgeon can plan the procedure.

You will be put under a local or general anaesthetic so that you do not feel anything.

The neurosurgeon will make a small hole (known as a burr hole) in your skull using a tiny drill.

Then, a very fine needle will be passed through the hole and into the tumour. A small section will be removed so that a pathologist can look at it under a microscope and determine what type of tumour it is.

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## Stereotactic biopsy

### How is it done?

This is a special kind of biopsy. Images or pictures of the brain are taken first to guide the surgeons to the tumour.

Before the procedure, you will be fitted with a metal head frame. Several images are taken to get an accurate three-dimensional view. This enables the surgeons to place the needle in the exactly the right place.

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## Neuroendoscopy

### How is it done?

This test is done under general anaesthetic. A hole, 2cm wide, is drilled into the skull. A fine tube called a neuroendoscope is put into the hole and into the fluid-filled chambers of the brain (the ventricles). This test may be done to:

- Take a biopsy of a tumour that is in or near the ventricles;
- Take fluid samples for tests;
- Drain fluid if too much has built up and caused an increase in pressure (hydrocephalus).

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## Risk and consent

The thought of having a biopsy may seem quite scary. There is a risk with all surgery. However, a biopsy is actually quite safe and will help the team of consultants to decide which treatment is best for you.

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## What are the risks?

As biopsies are quite minor operations, the risks involved are very small. The main risk is bleeding or swelling afterwards. You may be given some steroid drugs to control any problems.

## Consent

You will have to sign a consent form before any operation you have in hospital. Signing it means that you fully understand what will happen to you and that you are aware of any risks and side effects that the treatment may have. It is important to ask your doctor any questions you may have before you sign it.

## Do I need a biopsy?

Doctors can often tell from the scans you have had what type of tumour you have.

However, they cannot be completely sure of the type or grade of the tumour until they have looked at the cells it is made of under a microscope.

If the surgeon is not sure that it is a tumour, they will often do a biopsy to make sure rather than put you through a big operation that is not needed.

In some cases a biopsy may not be needed.

If the scans show the biggest part of the tumour can be taken out and it is in an area of the brain that can be reached quite easily, they may decide to take out all or part of the tumour without first doing a biopsy.

This is so you do not have too many operations.

If your tumour is in a part of the brain that cannot be reached easily or is close to important parts of the brain, it may be quite risky to do a biopsy. If the tumour is small, looks benign (non-cancerous), and does not seem to be causing any harm, the neurosurgeon may prefer to leave it alone but keep an eye on it using scans to make sure it does not change.

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# Diagnosis – other tests

A variety of other tests may be used to find out more about a brain tumour.

## Lumbar puncture

This test is only used for some types of brain tumour.

The test involves getting a sample of cerebrospinal fluid (the fluid which is found in the spaces inside the brain) and examining it for cancer cells.

Doctors can't always do this test on people with brain tumours. If the pressure inside the brain and spinal canal (the intracranial pressure) is too high, a lumbar puncture would be dangerous.

To have the test, you lie on the examination couch on your side with your knees drawn up to your chest. This curves your back and makes it easier for the doctor to get the needle into the right place. The doctor will numb the area with a little local anaesthetic. Then, the doctor will slowly and carefully push the needle into your spine. Once the tip of the needle is in the right place, the doctor pulls the needle out, leaving a tube (cannula) in place.

A collecting bottle is placed under this tube and some of the cerebrospinal fluid drips out. The doctor sends this fluid to the lab to be looked at under a microscope.

After the lumbar puncture, you have to stay lying down for at least a couple of hours. If you get up too soon, you may get a bad headache.

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## Myelogram

This test looks at the spinal cord.

First you have a lumbar puncture. Then the doctor injects a dye into the space around the spinal cord.

Cerebrospinal fluid flows through this space. The dye spreads through this fluid.

Then, you have X-rays taken. If a tumour is blocking the flow of the fluid, the dye cannot get past it. And so the position of the tumour will show up on the X-rays.

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## Angiogram

This test examines the blood supply to the area being scanned. Angiograms are not done as often as they once were, but they are an important test for some types of brain tumour. This is because the surgeon may need to know:

- Which blood vessels are supplying the tumour
- If the tumour is attached to any major blood vessels in the brain.

Angiograms are sometimes used when a tumour is growing very deep inside the brain.

For this test you will usually have to come into hospital overnight. You will need a sedative or a general anaesthetic. You have the angiogram in the X-ray department.

First, you will have a tube (catheter) put into a blood vessel in your groin. The doctor injects a dye into the tube. After a minute or so, the dye will have circulated through your blood vessels into your brain.

The dye shows up on an X-ray. Your surgeon will look at your brain on an X-ray screen to see exactly how near the tumour is to the blood vessel.

Depending on the type of brain tumour you have, your surgeon may then inject something to block the blood vessels that carry blood to the tumour. This will help to shrink the tumour before you have surgery to remove it.

This procedure is called embolisation or interventional angiography.

There is a small risk of a stroke from this procedure. But the risk is usually small compared to the benefit of treating the tumour.

Before you have this treatment, your specialist will explain all this to you and you will be able to ask questions or talk through any worries that you have.

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## Electroencephalogram (EEG)

This is a recording of the electrical activity within the brain.

During the test, wires connected to small plastic discs are attached to your head using a special gel. The activity in your brain (nerve impulses) is recorded and then printed out on paper. The test takes about an hour. It is safe and completely painless. Your hair does not need to be cut and the gel will wash out easily afterwards.

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# Diagnosis worries

You may have have worries or concerns about symptoms, diagnosis and treatment.

### **I don't think my doctor is listening to me – what do I do?**

If you are worried that your doctor is not taking your symptoms seriously enough, you could print out our diagnosis information and ask your GP to talk it through with you.

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You could also see more detailed guidelines to help doctors decide if they should send patients to specialists. It might be helpful to print the sections of information that concern you and discuss them with your GP. The following information might be useful:

NICE guidelines

<http://www.nice.org.uk/nicemedia/pdf/CG027fullguideline.pdf>

Summary of GP guidelines

<http://www.gpnotebook.co.uk/simplepage.cfm?ID=1905918027>

### **Can I get a second opinion?**

You can find out more about getting a second opinion here.

### **Can I ask to have a particular type of treatment?**

You can ask your doctor about different treatment choices.

It may not be the best treatment for you because the risks are bigger than the benefits or because the treatment does not work in your situation.

The treatment may also not be licensed or may not be free on the NHS.

### **Can I refuse treatment?**

Yes, but this is a decision you should take carefully after talking it through with your doctor.

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Brain Tumour UK is the leading, caring charity committed to fighting brain tumours. Our personalised support is available online, on the phone, by email and through our support groups. Our scientific research improves the quality of life for brain tumour patients and identifies better treatments. We raise awareness to change things for the better, for everyone affected by a brain tumour.

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