

# Having Gamma Knife®



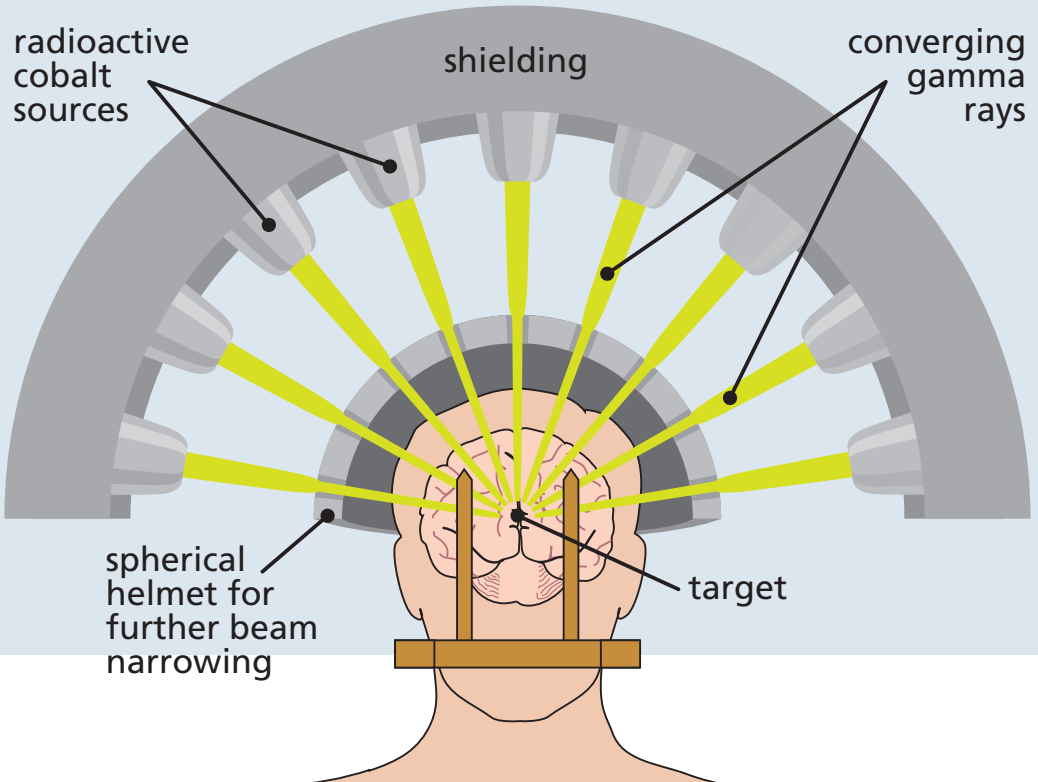
This leaflet from Great Ormond Street Hospital (GOSH) tells you about Gamma Knife®, what it is used for and what to expect if your surgeon suggests you have it. Gamma Knife® is a specific type of stereotactic radiosurgery, used to remove lumps or growths inside the brain.

[Information for young people](#)

## What is Gamma Knife®?

Gamma Knife® is a way of destroying a lump or growth inside the brain using radiation beams that pass through the skin and skull. This means that you do not need surgery where your skull is opened so the surgeon can get to your brain. This also means that there is a reduced risk of damaging the brain tissue around the lump or growth.

It uses a substance called cobalt to make the radiation beams. These are arranged in a semicircle so that all the beams point towards the centre. They can be focused to the specific area of the brain containing the lump or growth. Although the beams contain radioactivity, they do not cause any toxic problems as each beam is very weak but focusing them in one small area gives a high dose just to that specific area.



## When is Gamma Knife® used?

It can be used for:

- Lumps or growths (tumours) in the brain tissue
- Tangles of blood vessels (arteriovenous malformation or AVM) inside the brain
- Some forms of epilepsy where the seizures start in a specific area of brain tissue

Gamma Knife® is usually suggested if the specific area of the brain to be treated is near an area for important functions, such as speech or movement. It is also better for destroying problem areas deep inside the brain where reaching it by opening the skull could be risky. It may also be better for children and young people with additional problems who might be too sick for open surgery.

## Are there any alternatives?

There are some alternatives available but they may not be suitable for you or available at GOSH. For instance, CyberKnife® is similar to Gamma Knife® but uses targeted x-rays rather than gamma beams. Proton beam therapy is another alternative which uses a beam of proton particles to affect the lump rather than radioactivity. If the team thinks these offer a better option for you, we will refer you to another hospital.

## What does Gamma Knife® involve?

### Pre-admission clinic

The first stage is to come to a pre-admission clinic. This is where we check that you are well enough for the Gamma Knife® and anaesthetic. We will carry out some checks and measurements and usually take some blood samples for testing too. This is a good time to ask any questions you have about the Gamma Knife® and getting better afterwards.

### Fasting

Most children and young people have Gamma Knife® while they are under anaesthetic so they are not aware of what is happening. This means you will need to 'fast' or stop eating and drinking for a few hours beforehand. This reduces the risk of your stomach contents entering your lungs during and after the procedure which could damage them.

### Keeping clean

You should have a shower or bath (including a hairwash) before coming to GOSH. Please do not put any gel or spray on your hair as we might have to wash it again before you have the Gamma Knife®.

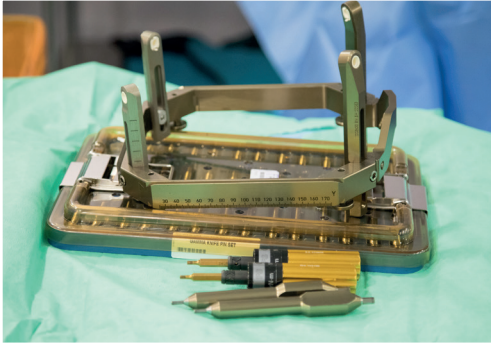
### Gamma Knife® day

Your admission letter will tell you what time to come to Woodpecker (our Same Day Admission Unit).

If you are a girl aged 12 years or more, the nurses will ask you about your periods and may ask you to give a wee sample to check you are not pregnant. Gamma Knife® uses radiation so could be harmful to babies in the womb.

The Neurosurgery team will visit you to confirm that you (and your parents) still want to have the Gamma Knife®. An anaesthetist will also visit you to talk about the anaesthetic and waking up afterwards.

We will then walk you to the anaesthetic room – your parents can come with you and stay until you are under anaesthetic. An anaesthetist will monitor you closely all the time you are under anaesthetic.



## Having Gamma Knife®

The first stage is to fit a 'headframe'. This is held in place with pins that go through your skin into your skull but you will not feel anything under anaesthetic. We will not need to clip any of your hair to fit the frame.



The next stage is to have an imaging scan to measure the precise location of the lump or growth in relation to the measurements on the headframe. Usually this will be a MRI scan, and, if you have an AVM, an angiogram will be taken as well. You will still be under anaesthetic for the imaging scans. Straight afterwards, the team will look at the results to work out the precise area to be treated and the strength of beams needed.



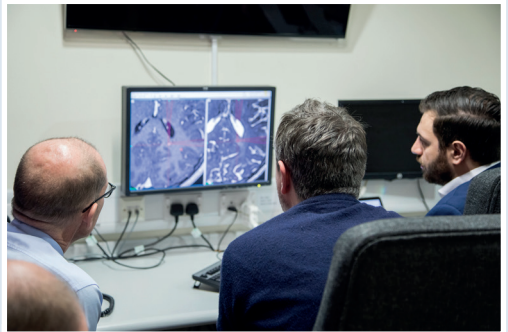
We will then put you on to the bed in the Gamma Knife® machine – the headframe will lock into position so that your head stays still. You will still be under anaesthetic, monitored by the anaesthetist, for the Gamma Knife® procedure. The bed moves into the Gamma Knife® machine and treatment will start. It usually lasts from 30 minutes to three hours, depending on the size and shape of the area being treated.

Once the Gamma Knife® has finished, we will take off the headframe while you are still under anaesthetic. We remove the pins and cover the area with small sticking plasters. When you are starting to wake up from the anaesthetic, we will call your parents to sit with you. They will go with you back to the ward to recover fully. Usually you will stay overnight and go home the following morning.

### **Could anything go wrong?**

The risks of Gamma Knife® will vary depending on where the lump is in your brain and its size. However, in general, Gamma Knife® has a much lower risk of bleeding and infection than open surgery as there is no need to make large skin incisions or open the skull.

Although Gamma Knife® targets a precise area of brain tissue, it can still affect the cells nearby making them swell. A few doses of corticosteroid medicine is usually enough to reduce this swelling. Nearby structures such as specific nerves can also be affected causing numbness but usually on a short term basis only.



Occasionally, children and young people have a seizure after Gamma Knife® - this is a reaction to the procedure as is feeling tired and a bit sick afterwards. As the beams pass through your skin, it might affect a small patch of hair making it fall out. This is also a short term problem and the hair usually grows back well afterwards.

Sometimes one treatment is not enough so it needs to be repeated – as before, the chance of success and the risks associated with Gamma Knife® depend on the size and location of the lump.

### **When you get home**

You might have a bit of a headache for the first few days after Gamma Knife® - you can take regular pain relief such as paracetamol or ibuprofen. You should be fine to go back to school or college two to three days after coming home.

Keep a close eye on the pin sites, cleaning them gently when you wash your face. Do not scrub them and pat them dry gently until they have healed completely. You can have a hair wash and shower or bath the day after you get home.

Call the ward if you:

- Get a headache that does not get better with pain relief
- Bleed or ooze from the pin sites
- Feel weak or have problems seeing that are worse than before Gamma Knife®
- Have a seizure when you have not had one before

If you or your parents are concerned, you should go to your nearest Accident and Emergency (A&E) department.

### **Follow up appointments**

You will need to come back to GOSH for a check-up about eight weeks after Gamma Knife® and then at regular points during adolescence. Gamma Knife® is a safe and effective form of treatment with a reduced risk of long term problems such as learning disability and vision problems. However, you will need regular follow up to make sure the original problem does not come back. You will have scans at various points in the future – which scans you need at which point in time will depend on the type of problem that was treated with Gamma Knife®. Gamma Knife® can be repeated safely if needed.

## Further information and support

Contact our Neurologist Clinical Nurse Specialists  
on 020 7405 9200 extension 0569

There are lots of support organisations for anyone affected by brain tumours and diseases, the main ones in the UK are:

- The Brain and Spine Foundation – call their helpline on 0808 808 1000 or visit their website at [www.brainandspine.org.uk](http://www.brainandspine.org.uk)
- Macmillan Cancer Support – call their helpline on 0808 808 0000 or visit their website at [www.macmillan.org.uk](http://www.macmillan.org.uk)
- The Brain Tumour Charity – call their information line on 0808 800 0004 or visit their website at [www.thebraintumourcharity.org](http://www.thebraintumourcharity.org)

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Information for children and young people