



Media Backgrounder

What is Gamma Knife?

Gamma Knife is a unique method that delivers extremely focused radiation beams to targets in the brain. It offers effective treatment for a range of conditions without the need for invasive brain surgery.

The surgery does not require the skull to be opened for performance of the operation and the patient is treated in one session. Usually they can return home shortly after treatment, sometimes on the same day.

What is the Gamma Knife used to treat?

The Gamma Knife is used to treat deep seated lesions, vascular malformations and metastases within the brain that are inoperable, or where normal surgery is expected to fail. These types of tumours include:

- Acoustic neuroma (vestibular schwannoma - benign tumour that develops from the lining of the auditory nerve)
- Other neuromas (a benign tumour)
- Cancer metastases (tumours which spread from cancer in a different part of the body)
- Meningiomas (a tumour of the meninges, which are the protective membranes around the brain and spinal cord)
- Pituitary adenomas (an abnormal growth, or tumour, in the pituitary gland)
- Trigeminal neuralgia (extremely severe facial pain that tends to come and go unpredictably)
- Vessel malformations (AVMs, cavernomas)
- Other small brain tumours

How many patient in the UK could be treated by the Gamma Knife?

Taking into account the prevalence of tumours in the UK – approximately 4,000 people in the UK with non-cancer related tumours and 21,000 with cancer related tumours could be treated with the Gamma Knife. However the numbers of patients actually being treated is much less (less than 2500) and there is a need to increase awareness of

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the advantages Gamma Knife surgery offers including clinical, cost effectiveness and patient experience.

What technology is used in the Gammaknife?

The Gamma Knife, which is manufactured by Swedish firm Elekta AB, consists primarily of a metal helmet through which radiation doses can be targeted on a particular point in the head through cobalt (radiation) sources.

The shape and dose of the radiation is optimised to hit only the target with precision (where there may be a tumour) without damaging any of the surrounding healthy tissue. Patients being treated will not be required to have their head shaved and it will not affect their hair.

Magnetic resonance imaging (MRI), computed tomography (CT) or angiography is used during the procedure to understand what is happening within the brain and allowing focused targeting.

What is the treatment process?

The treatment consists of four main steps:

- **preparation** of the patient and ensuring the framework fits the patient's head
- **reviewing** the tumour using imaging techniques e.g. MRI and sometimes CT,
- **treatment planning**
- and then **treatment** using the Gamma Knife technology.

A patient can sometimes be discharged within the same day or an overnight stay may be required. A patient will then be monitored over the coming weeks and months.

Why has BMI Thornbury installed the Gamma Knife in Sheffield?

The installation is a joint venture between Medical Equipment Solutions Ltd and the BMI Thornbury. Both companies feel it is important to invest in Gamma Knives in the UK, as it provides a treatment alternative to invasive brain surgery. The consultants at the BMI Thornbury have the expertise and the knowledge to operate the Gamma Knife effectively.

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What are the benefits of the Gamma Knife compared with other treatment options?

Gamma Knife radiosurgery (GKRS) has many advantages compared with traditional surgery and other types of radiation treatment.

- Usually only involves a single night's stay in hospital, and frequently not even that, as opposed to the extended stay often necessitated by surgery
- Offers the prospect of return to work, driving, and other normal social activities within a few days in the vast majority of cases and frequently as soon as the day following treatment
- High levels of effectiveness proven to be comparable or better than other treatment
- Some 60,000 patients treated per year worldwide and an impressive scientific track record with thousands of peer-reviewed articles. No other non-invasive treatment method in this field has greater clinical acceptance.
- Delivers significantly lower dose of radiation to surrounding healthy tissue than conventional fractionated radiation therapy
- The risks of infection, and haemorrhaging are eliminated together with scarring and potential disfigurement that results from conventional neurosurgery.
- The small risk associated with general anaesthesia is eliminated. A mild sedative is occasionally used
- Low risk of post-surgical complications
- An individual who might be a relatively high risk candidate for conventional surgery may be a much safer candidate for GKS.
- Unlike conventional whole brain radiotherapy Gamma Knife radiosurgery is directed very specifically at the target. This spares most of the adjacent normal brain tissue from exposure to unnecessary excess radiation.
- Unlike conventional radiotherapy which is often delivered over several weeks, GKS can nearly always be delivered as a single treatment over the course of less than a day. Multiple hospital visits are therefore avoided.

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You can access information about latest news about the centre at our website. High resolution images can be provided electronically in format of your choice

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