

Gamma Knife: Brain metastases patient information

The London Gamma Knife Centre
at The Wellington Hospital

part of **HCA**Healthcare UK

Treatment of brain metastases

Being diagnosed with cancer is difficult – learning that it has spread to the brain can be devastating. It is estimated that 20% to 40% of all patients diagnosed with cancer will develop secondary cancer in the brain, brain metastases. The good news is, there are effective treatments that offer new hope and make it possible to experience a consistent and uncompromised quality of life.

The number of patients who receive treatment for brain metastases is increasing every year. This is due to the many improvements in detection, diagnosis and treatment, and to the fact that patients live longer with their primary cancer. In addition, patients and their families are becoming better informed, which means they often rightly seek second and third opinions about treatment alternatives.

There are several treatment options for patients with brain metastases. These include stereotactic radiosurgery (SRS), Gamma Knife, (CyberKnife, TrueBeam) whole brain radiation therapy (WBRT), open surgery, chemotherapy, immunotherapy and other types of medications. Often a combination of

these treatment modalities may be used depending on the size, location and number of brain metastases.

Not every patient is a candidate for every type of treatment, which is why it is important that you discuss your options with your doctor.

Treating brain metastases with Gamma Knife radiosurgery

Gamma Knife surgery doesn't require an incision or the hair to be shaved before the treatment. The key to the success of Gamma Knife radiosurgery is its unique ability to precisely deliver many individual beams of high-intensity radiation, targeting even the smallest tumour with sub-millimetre precision. Each beam has a relatively low energy, so the radiation has virtually no effect on the healthy brain tissue it passes through. At the focal point, however, all the beams converge to deliver a high dose of radiation that kills the cancer cells, even in deep-seated tumours with irregular shapes. Gamma Knife radiosurgery may be used as the primary treatment method or as a boost or adjunct to other treatments, such as WBRT or surgery.

What are the advantages of Gamma Knife Surgery?

Gamma Knife is a proven radiosurgery system dedicated to treating the most complex area of the body – the brain. The most common disease treated with Gamma Knife radiosurgery is now brain metastases.

Non-invasive: Despite its name, no incisions are made. There are none of the complications associated with surgery.

Effective: More than 85% of tumours treated do not return.

Proven: Over 2,800 scientific articles have been published on Gamma Knife radiosurgery, and more than 1 million patients have been treated worldwide, of which more than 250,000 have been treated for brain metastases.

Accurate: Leksell Gamma Knife is known for delivering radiation with submillimetre accuracy, precisely to the unique contours of the tumour while minimising radiation to surrounding healthy tissue.

Flexible: Gamma Knife radiosurgery can be used to treat metastases located in areas that cannot safely be reached by traditional surgery, such as the brainstem.

One treatment session: Unlike conventional radiation therapy, which requires treatment over multiple days or weeks, Leksell Gamma Knife delivers a high dose of radiation to one or more brain tumours during a single treatment session, in one day. If the tumour being treated is too large for single fraction radiation, it is also possible to stage the treatment in three fractions at 2 weekly intervals.

Fast & gentle: Most patients can leave the hospital the same day or the day after treatment and resume normal activities in a day or two. Therefore, recovery time and time spent in hospital is kept to a minimum.

Minimal side effects: As radiation is delivered specifically to the tumour, there is a reduced risk of a negative impact on brain function. Some people may experience headaches just after treatment.

Repeatable: Patients who develop new brain metastases can be retreated with Gamma Knife radiosurgery. This is typically not possible with WBRT.

Treatment day

Before the treatment

Before the treatment your doctor will inform you about the procedure and obtain your consent. Gamma Knife radiosurgery does not require cutting or shaving your hair. The next step is the application of the head frame or the moulding of a facial mask depending on the size and type of tumour being treated.

Securing accuracy

A key component in Gamma Knife radiosurgery is the stereotactic head frame. The frame allows the doctor to accurately pinpoint the target to be treated in your brain. This lightweight frame, which is attached to your head with four pins, ensures that the radiation beams can be directed with precision to the target. The frame also prevents your head from moving during imaging and treatment. Local anaesthetic is applied where the pins are to be attached. The latest Gamma Knife machine, the Icon, adds the option of a radiotherapy mask for suitable patients.

Target localisation

After the head frame is in place an MRI scan will be performed and

occasionally a CT scan will also be needed. Imaging is required to determine the exact size, shape and position of the tumour. During imaging, a coordinate box is placed on the head frame to provide reference points on the images for the treatment plan. After imaging, the coordinate box is removed.

Treatment planning

Once your images have been taken, you can rest while your doctor develops a very precise and accurate treatment plan. Each plan is unique and is individually prescribed to address the patients' specific medical condition. The doctor, together with other specialists in the team, designs the treatment using a powerful planning computer which calculates the dose given/and the time needed for treatment.

The treatment

Once your plan is completed, the actual treatment can start. You will lie down on the treatment couch and the head frame/or mask will be secured. You are awake during the procedure and will be able to communicate with your radiographer through an audio and video connection. When the

treatment begins, the couch will move into the dome section of the unit. The treatment is silent and totally painless. Should you wish, you will be able to listen to music while it is ongoing. The team will be monitoring the procedure at all times. Treatment times are variable, depending on the number of tumours that are treated, as well as the size and shape of each target. Typically a single treatment will require somewhere between 1-3 hours. You will be told exactly how long once the plan is completed.

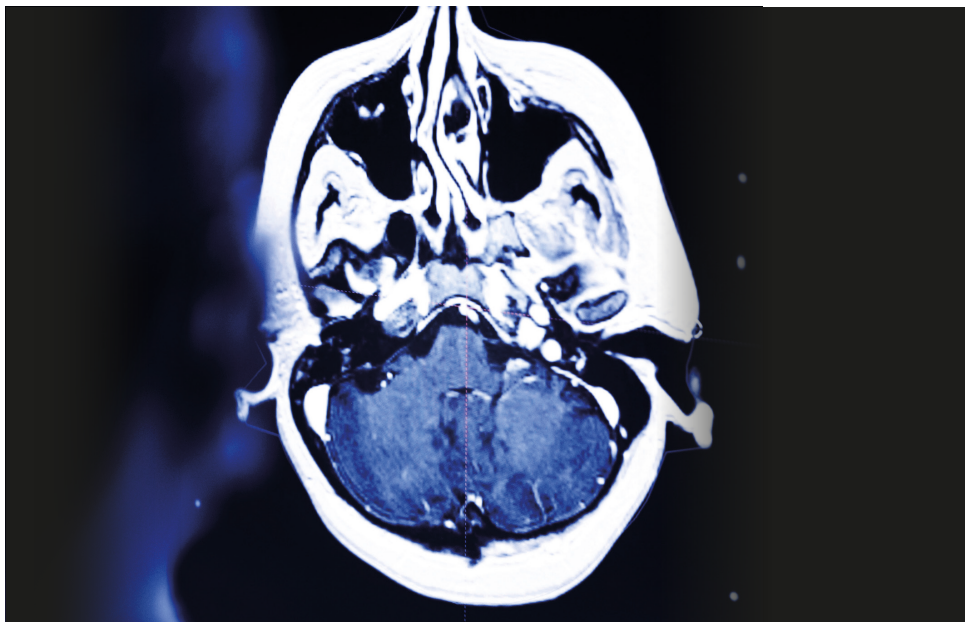
After treatment

When your treatment is complete, the head frame will be removed. Some patients experience a mild headache

or minor swelling where the head frame was attached, but most report no problems. Your doctor will tell you whether or not they want you to stay overnight for observation or if you can go home immediately. Either way, you should be able to return to your normal routines in a day or so.

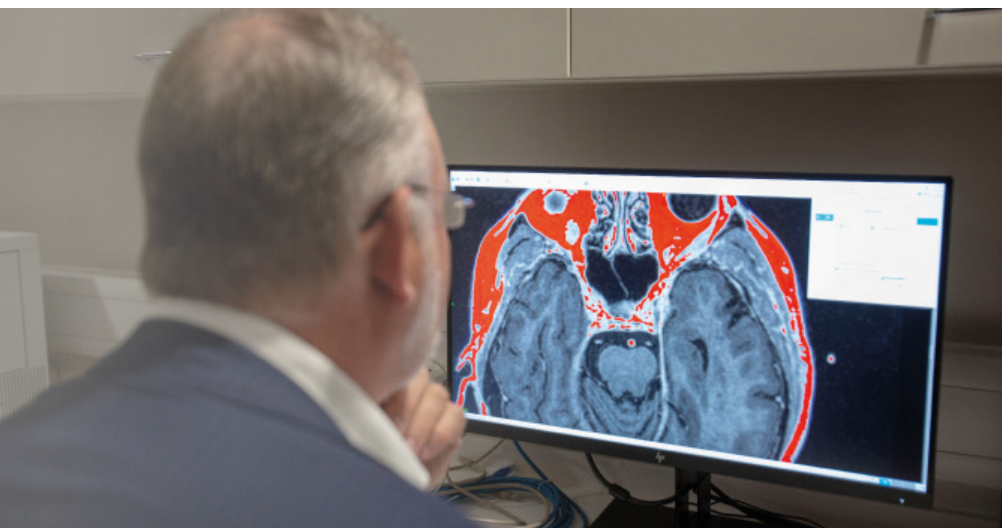
What happens next?

The effects of your treatment will occur over time. Radiation treatments are designed to stop the growth of tumours, which means that the effect will be seen over a period of weeks or months. Your doctor will stay in contact with you to assess your progress, which may include follow-up with MRI, CT or PET scan images.



Facts

- Intracranial secondary tumours – or brain metastases – are found in approximately 20% to 40% of all cancer patients. The most common types of cancers that result in secondary tumour of the brain are lung cancer, breast cancer, malignant melanoma, kidney cancer and colon cancer (in decreasing order of frequency).
- Brain metastases are the most common form of tumour in the brain.
- Studies that examine the effectiveness of Gamma Knife radiosurgery show that local tumour control rates – in which a specific tumour stops growing – exceeds 85% on average for any brain location.
- More than 250,000 patients with brain metastases have been treated with Gamma Knife radiosurgery worldwide.
- Side effects are rare. For example, the risk of brain injury leading to problems with memory and concentration is lower with radiosurgery than with WBRT.



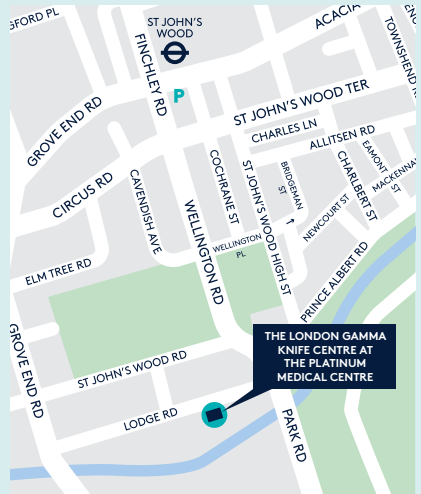
Where to find us

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Underground

St John's Wood (Jubilee line) is a 15 mins walk

Baker Street (Bakerloo, Circle, Hammersmith, Jubilee & Metropolitan lines) is a 20 mins walk

National Rail

Marylebone is a 20 mins walk

Bus

Bus stop: Park Road/Lord's Cricket Ground. Bus no 13, 82, 113, 274, N13

Parking

Car parking is limited at the centre however parking is available nearby at the Q-Park St John's Wood car park on Kingsmill Terrace

Our group

The Wellington Hospital

The Princess Grace Hospital

The Portland Hospital

The Lister Hospital

The Harley Street Clinic

The Christie Private Care

London Bridge Hospital

Leaders in Oncology Care

HCA UK at University College Hospital

HCA UK at The Wilmslow Hospital

GP Services

020 3214 3500

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