

GAMMA KNIFE SA

Introducing Gamma Knife Icon - Now in South Africa



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What is Gamma Knife Radiosurgery?

First of all, it isn't a knife at all. It is non-invasive medical technology that uses 192 invisible, intersecting, Gamma ray beams of radiation to deliver a highly therapeutic dose to a target with sub-millimeter precision. It is used to treat brain tumours, vascular malformations and functional disorders.

There is no cutting or incisions made with this treatment. The recovery is quick and the treatment is generally administered on an out-patient basis. A multidisciplinary team including surgeons, radiation oncologists, radiation physicists and radiotherapists work together to generate an optimal treatment plan, delivering a high dose of radiation to the target while sparing the surrounding normal brain.

What happens during Gamma Knife Radiosurgery?

Upon your arrival at the Gamma Knife Unit, the treatment team will explain the entire procedure to you in detail. To ensure accurate treatment, a targeting frame is fitted on your head using local anesthesia to make the placement as painless as possible. Your neurosurgeon will place the metal frame on your head and secure it with four pins, a few millimeters into your scalp. Foam will be placed in each of your ears. Plastic ear bars will be placed on the foam in each ear to balance the frame while it is secured. The discomfort from the ear bars is temporary – they are removed as soon as the frame is stabilized. Frame placement takes about five to ten minutes. The frame will remain in place throughout your procedure.



The frame helps the treatment team to pinpoint the target, prevent any movement during the procedure, and allows for maximal accuracy of the radiation beams. Detailed imaging studies including a CT and an MRI scan will then be performed. Although you may have had these imaging studies before, they must be repeated with the frame in place to precisely define the location, size and shape of the treatment area.

Once imaging is complete, you will be taken to a quiet area to rest whilst the team create your treatment plan in the Gamma Knife treatment planning software. The physicians will use the data from the imaging scans to plan your treatment which may take up to 2 hours. When your treatment plan is completed it is time for treatment.



No anaesthesia is required, but you may be given sedation to help you relax. The Gamma Knife Unit looks similar to a CT scanner. You will be helped onto the machine's table or couch, lying on your back and the frame will be attached to the appropriate treatment helmet. Securing the frame prevents your head from moving during treatment. The couch smoothly slides into position in the Gamma Knife machine.

You will not see, hear or feel the radiation during treatment. The medical team will exit the room and shut the door once treatment is ready to begin. You will be in constant view through two CCTV monitors. Sensitive microphones inside the room also allow you to speak to the team anytime during treatment. In the event you want to interrupt the treatment for a bathroom break or repositioning, you may notify the staff through the monitor.

The couch will move out of the machine to the original position, the Gamma Knife machine doors will close, the treatment room door will open, and you will be helped by the staff. Your treatment will last between twenty and ninety minutes depending on your personalised plan.

When treatment is over, your doctor will remove the head frame. Some patients might experience swelling or a mild headache where the frame was attached but this is relatively rare. Depending on what your doctor feels appropriate you may have to stay in hospital for several hours or rarely overnight for observation.



Frameless Treatment

The Gamma Knife Icon model is the first Gamma Knife unit to offer frameless treatment. For this procedure, a facemask is fitted to your head instead of the frame. The facemask is molded to conform to your face by using thermoplastic material. After fitting the mask to your face, CT and MRI imaging of your brain is done, with the mask on, and another cone beam CT is done just before treatment to make sure in the creation of the treatment plan, the target has been precisely located. With the mask system, localisation and treatment need not occur at the same session, allowing the possibility for fractionated (more than one session) stereotactic radiotherapy.

Your specialist may request this option when tumours lie near to critical structures like the optics or the brainstem since normal brain tissue and nerves in the head can tolerate many smaller doses of radiation better than one large dose.

Indications treated

Since 1967 when the first Gamma Knife prototype was used to treat a patient, over a million people worldwide have undergone Gamma Knife surgery with an excellent record of successful and safe treatment. Gamma Knife surgery is used exclusively for the brain, head and neck.

Amongst others, it is highly effective in treating the following conditions:

Brain Tumours

Metastases

A 'Secondary' or Metastatic tumour is defined as a tumour which has spread distantly from the original or 'Primary' cancer site, through the blood circulation, lymphatic system or spinal fluid. This can involve either a single lesion (Metastasis) or multiple tumours.

Not all patients are suitable for Radiosurgery, as often it requires that there are only a low number of lesions within the head, all of which ideally are below a threshold volume, (as the larger the volume, the more healthy brain tissue will be treated).

Meningioma

Meningiomas are one of the most common 'brain tumours'. They are identified as a tumour arising from the meninges, the outer membrane sheath covering the brain and spine. Gamma Knife can play a role in the control of these tumours as it can either be used as the primary treatment for smaller lesions, or after surgery where complete removal was not possible or if a tumour has recurred post-surgery.

Neuroma

A Neuroma is a tumour that arises from the cells of a nerve. Benign in nature, these are often slow growing. The type of neuroma most often treated using Gamma Knife surgery is an 'Acoustic Neuroma'

Pituitary Adenoma

The pituitary gland is located at the base of the brain and secretes hormones to regulate growth and control most of the other hormone based systems in the body. In cases where the pituitary tumour is of significant size or is in direct contact with the optic nerves, surgery may be the initial treatment method to 'debulk' the tumour before treating the remain tumour with Gamma Knife.

Gliomas

These tumours arise from the Glial cells within the brain and are malignant in behaviour. Smaller tumours or areas of recurrence are sometimes suitable for Gamma Knife treatment. Other Tumour types which may be suitable for treatment with Gamma Knife include conditions such as Astrocytomas, Craniopharyngiomas, Chordomas, Haemangioblastomas and Pinealocytomas.

Functional Conditions

Trigeminal Neuralgia

Trigeminal Neuralgia is a disorder associated with the Trigeminal nerve. It presents as a sudden onset severe shooting or burning facial pain that can occur spontaneously and may last for a few seconds or as consistent short bursts over a number of hours. The pain almost exclusively involves only one side of the face, more often the right-hand side. Although Trigeminal Neuralgia can involve any of the three branches of the Trigeminal nerve, it often affects the second and third branches



Vascular Disorders

Cavernoma

A cavernoma is a vascular abnormality consisting of a cluster of abnormal vessels occurring within the central nervous system, often ranging from microscopic in size to a number of centimetres. A cavernoma is made up of small structures, caverns, filled with blood. Cavernomas that have bled previously are more likely to bleed again, especially in the next 24 months after the initial bleed. Cavernomas suitable for Gamma Knife include: cerebral cavernous malformations (CCM), cavernous venous malformations (CVM) or cavernous angiomas.





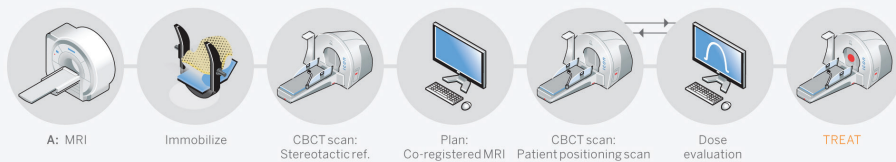
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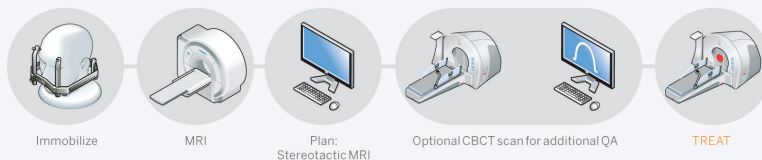


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