



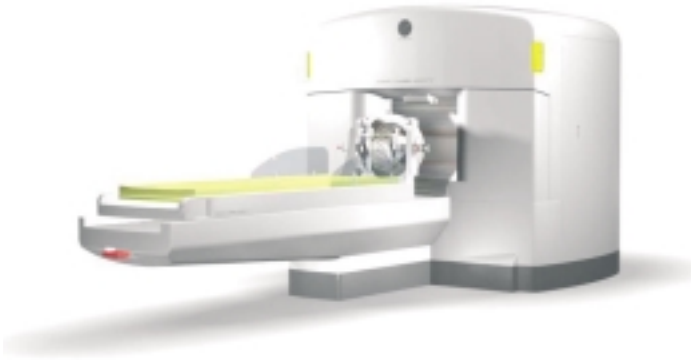
Gamma Knife Surgery

Information for patients

Gamma Knife Surgery is a well-established treatment method used to treat selected targets in the brain. Leksell Gamma Knife® is not a knife in the normal sense of the word. The doctor makes no incisions in your head. Instead, very precisely focused

beams of radiation are directed to the treatment area in the brain.

Gamma Knife® Surgery offers a safe and effective treatment for more than 30,000 patients every year. The treatment procedure is simple, painless and straightforward.



The treatment consists of four steps:

- 1.** attaching the frame
- 2.** imaging: CT, MRI or Angiography
- 3.** treatment planning
- 4.** treatment

What is Gamma Knife Surgery?

Gamma Knife Surgery is a unique method that delivers extremely focused radiation beams to targets in the brain. 201 individual beams converge to one focal point. The radiation source used is called cobalt. These sources are posi-

tioned in a hemisphere so that all the beams can converge on a single point. The shape and dose of the radiation is optimized to hit only the target, without damaging surrounding healthy tissue.

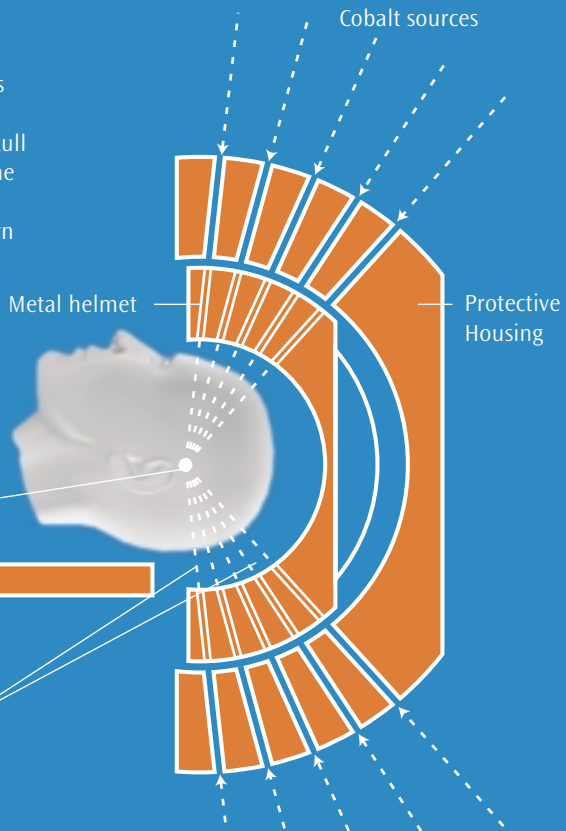
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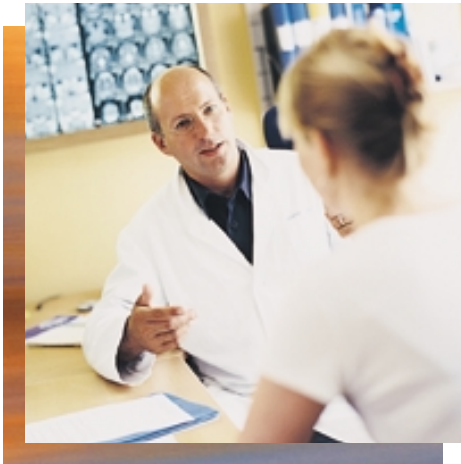
Treatment method

Gamma Knife Surgery is a bloodless surgery for neurological diseases. The surgery does not require the skull to be opened for performance of the operation. The patient is treated in one session and can normally return home shortly after treatment.

The method facilitates treatment of very small targets deep within the brain.

201 radioactive beams are focused on the target in the brain to be treated through a metal helmet, in which the patient's head is placed by using fixation of the head frame.





Before the treatment

Before treatment your doctor will inform you about the entire procedure. Gamma Knife Surgery does not require cutting or shaving of your hair. The next step is the application of the head frame.

The head frame

A key component in Gamma Knife Surgery 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 screws, 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 procedures. Local anaesthetic is applied where the screws are to be attached.





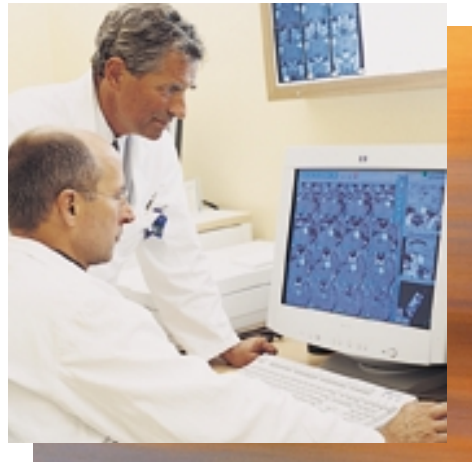
Imaging

After the head frame is in place, it is time for imaging to be done; such as magnetic resonance imaging (MRI), computed tomography (CT) or angiography. Imaging is required to determine the exact size, shape and position of the target in the brain.

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 physician develops a very precise and accurate treatment plan. No two treatment plans are alike; every patient's plan is individually designed to address the specific medical condition. The doctor, very often together with another specialist in the team, makes the plan in a specially designed computer and calculates how the treatment should be performed. This usually takes a couple of hours.





The treatment

Once your treatment plan is completed, the actual treatment can start. You will lay down on the treatment couch and the head frame will be attached to the helmet. You are awake during the procedure and will be able to communicate with your doctor or nurse 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. Often you will be able to listen to music during the treatment.

The team will be monitoring the procedure at all times. The treatment will last a few minutes to more than an hour, depending on the size and shape of the target.

After the treatment

When your treatment is complete, the head frame will be removed. If you had an angiogram, you might have to lay quietly for several more hours.

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 he wants 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 another day or so.

Follow-up

The effects of your treatment will occur over time. Radiation treatments are designed to stop the growth of tumors or lesions, 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 MRI, CT or angiography images.



Where can I find more information?

Ask your doctor for patient organizations and web sites relevant to

your diagnosis. Always consult your doctor if you have any questions at all.

