

## The Leksell Gamma Knife

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The Gamma Knife is actually not a knife or a blade. This device was invented by a Swedish neurosurgeon Lars Leksell, which is the first instrument developed used for radiosurgery. The Gamma Knife is a device used in neurosurgery to treat malignant brain tumors, benign brain tumors, blood vessel defects, and vascular malformation such as arterio-venous malformations.

Before the procedure, a head frame is placed on your head with four pins. This frame is to ensure that your head does not move during the procedure. During the Gamma Knife procedure, the device directs up to 201 Cobalt-60 generated gamma beams on precisely the infected area and a number of imaging examinations will be required such as CT's, MRI's, and other cases angiograms for treating blood vessel abnormality.

The treatment is painless; children are most likely sedated while adults usually stay awake. Treatment takes anywhere from several minutes to a few hours to complete depending on the shape of the target and the dose required. Patients do not feel the radiation. Following treatment the head frame is removed. Each target generally requires only one treatment session.



The Gamma Knife procedure is performed by a team of radiation oncologists, a medical radiation physicist, and a neurosurgeon. The team will continuously monitor your procedure at all times. The procedure may take several treatments that last from about two to forty-five minutes.

Once your treatment is complete, the head frame will be removed. If you had an angiogram, you might have to lie 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 work or your normal routine in another day or so.

The effects of the Gamma Knife treatment will occur over time. Radiation treatments are designed to stop the growth of tumors or lesions, which means they won't disappear immediately but over a period of weeks or months. Your physician and Gamma Knife team will stay in contact with you to assess your progress, which will include follow-up MRI or CT images in the near future and periodic check-ups. (Gammaknife.org)

Since radiosurgery does not involve incisions, it is less risky than traditional neurosurgery. The common problems that usually arise are with anesthesia, bleeding, and possible infection. However, radiosurgery can cause radiation injury to the brain tissue. This sometimes causes swelling, which may develop months after the procedure. Patients also will experience minimal side effects such as hair loss, nausea, headaches, and mild discomfort from the pins of the headframe.

There are some advancement to improve targeting techniques and reducing the use of headframes. This will allow the procedure to be done on different parts of the body, such as lung tumors.

References:

[http://en.wikipedia.org/wiki/Gamma\\_knife](http://en.wikipedia.org/wiki/Gamma_knife)

<http://www.radiologyinfo.org/>

<http://gammaknife.org/>

<http://www.mayoclinic.com/health/gamma-knife-radiosurgery/HQ00736>