



What is a Gamma Knife?

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The Gamma Knife is a noninvasive neurosurgical instrument, which was developed by Swedish neurosurgeons Lars Leksell and Borje Larsson. Though used in its original form since 1968, it is considered state-of-the-art due to its highly sophisticated computer software through which it pinpoints intracranial lesions with sub-millimeter accuracy. It is not really a knife in the usual sense of the word but rather a bladeless "knife" that performs neurosurgery without an incision. The Gamma Knife is a form of *stereotactic radiosurgery*, which allows for the safe and highly effective treatment of problem areas in the brain using radiation. Using highly sophisticated 3dimensional computerized dose planning, the Gamma Knife delivers a single, concentrated dose of radiation to a small target within the brain by focusing gamma rays from 201 separate sources on the same precise point. The dose is delivered in a manner that conforms precisely to the location, size and shape of the target, thereby destroying it while protecting the surrounding normal brain tissue. Patients do not experience pain and are free to resume their normal lifestyle and activities the day following treatment.

How does the Gamma Knife work?

Tumors

In the treatment of tumors, the radiation delivered by the Gamma Knife actually destroys the DNA in the tumor cells so that they are no longer able to grow and reproduce.

Arteriovenous Malformations

Gamma Knife radiosurgery for arteriovenous malformations causes the endothelial lining of the abnormal vessels forming the vascular malformation to grow and proliferate, which over time cuts off blood supply to the malformation.

Trigeminal Neuralgia

In the treatment of trigeminal neuralgia, which is an excruciating facial pain condition, the Gamma Knife is focused on the trigeminal nerve root. The radiation diminishes or eliminates the abnormal nerve impulses that are causing the pain.

What are the complications?

The Gamma Knife eliminates the immediate post-op risks associated with open craniotomy such as hemorrhage and infection. Occasionally, the patient may experience some mild side-effects following Gamma Knife treatment depending upon the location of the problem being treated.

General

Selection of appropriate patients for Gamma Knife radiosurgery is made by the Gamma Knife Team and is based on individual case analysis. Gamma Knife treatment is especially valuable for those patients who have lesions situated in critical areas of the brain, making a surgical approach risky. For further information or to schedule an appointment, please call our office at (800) 334-0878.