

Gamma Knife Surgery Patient Information

Gamma Knife Surgery is a well-known treatment method used to treat selected places in the brain. More than 30,000 patients have Gamma Knife Surgery each year. There are 200 Leksell Gamma Knife systems in operation around the world. HCA hospitals and affiliated centers will have seven (7) Gamma Knife sites by the end of year 2004.



The Leksell Gamma Knife is not a knife in the normal sense of the word. The doctor makes no incisions in the head and the treatment, with a special type of radiation called gamma beams, is painless. This treatment allows the patient to quickly return to his or her normal daily routine.



Gamma Knife Surgery uses 201 extremely accurate gamma beams that are focused on the treatment area in the brain. The patient's head is placed in a helmet like device called a collimator with 201 small openings for the beams to move through to get to the targeted area. A lightweight frame is used to help position the head.

During treatment, all the beams meet in a focal point with sub-millimeter precision providing protection to the surrounding normal brain tissue. The individual beams are too weak to damage healthy tissue on their way to the treatment area, but are very powerful when they come together at a single point. This is like using a magnifying glass in the sun. By moving the head in one or more positions, the shape and dose of the radiation is optimized to treat only the target without damaging surrounding areas.

In most cases, a patient has a single treatment. There are four main steps:

1. Positioning the frame on the head
2. Having an MRI, CT or angiogram, an imaging treatment like an X-ray
3. Planning the treatment
4. Having the treatment



Positioning the lightweight frame does not require the hair to be cut or shaved. A local anesthetic or numbing agent is applied where the frame is to be placed. The frame is gently positioned on the head with four screws. The frame is used to keep the head steady during the treatment time.



Once the frame is in place, the patient goes to the Radiology Department for an imaging treatment to exactly define the location, size and shape of the treatment area. These images are used for sophisticated treatment planning to personalize the treatment to the needs of the patient. While this treatment planning is done, the patient can rest, eat, drink, read or even watch television. Once the plan is complete, the treatment will begin.

Usually two doctors will be involved in providing a Gamma Knife Treatment, a

Neurosurgeon and a Radiation Oncologist. They are assisted by a specially trained team of health professionals to insure the quality of the care provided to the patient.

Usually the patient is awake throughout the procedure, but the physician may choose to provide medicine to relax the person if needed. Before starting, the doctor or technologist will tell the patient how long the treatment will take based on the treatment plan and the specific needs of the individual.



The treatment is silent and totally painless. The number of movements of the machine will depend on the shape of the treatment area. The treatment team watches the patient on closed circuit television during the entire time of the treatment and the patient and staff communicate with an intercom system.

Once the treatment is complete, the frame is removed. Some patients may experience a mild headache or slight swelling where the frame was positioned. The doctor will discuss how to manage these after effects before the patient leaves the center and will also talk about needed follow up visits to see results of the treatment. Within a day or so, the patient may return to his or her normal routines.

Always consult your doctor if you have any questions about Gamma Knife Surgery.