

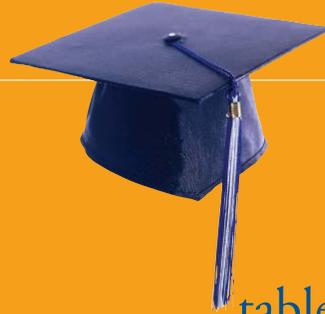


what's on **YOUR** mind?

A Guide to your Gamma Knife Surgery



Neuroscience  
Institute



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**Date of Surgery**

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**Physician**

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**Date of Follow-up Appointment**

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**Date of Follow-up MRI**

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what's on **YOUR** mind?



The **Gamma Knife** represents the most technologically advanced equipment on the market today. Using the latest in physics, imaging and computer technology, procedures can be performed in a short time period with unmatched precision.

At Northridge Hospital Medical Center we understand that medical procedures can be a little frightening. We believe the best way to calm your nerves is to be prepared and knowledgeable about your procedure. This guide should answer many of your questions regarding your Gamma Knife Stereotactic Radiosurgery. Of course, feel free to discuss any concerns with your physician.



## what is a **Gamma Knife**?

This procedure gives new hope to patients with brain tumors and other brain disorders. Patients avoid risks associated with open surgery, general anesthesia, a long hospital stay and rehabilitation, or even a single incision. Patients are often able to leave the hospital the same day and the procedure is virtually painless.

The Leksell Gamma Knife® by Elekta is a neurosurgery tool that, despite its name, is not a knife at all. The Gamma Knife delivers safe, effective brain surgery without a single cut or even shaving the hair. It focuses 201 beams of gamma radiation at the precise lesion or tumor in the brain. Using this technology, the diseased tissue in delicate locations can be treated with unprecedented accuracy while sparing the surrounding tissue.

The Gamma Knife's accuracy - within less than two-tenths of a millimeter - makes this the technology of choice for certain diseases of the brain. In addition, the Gamma Knife is safe. It has undergone 25 years of evolution, based on technical evaluation and patient use. More than 250,000 patients around the world have had Gamma Knife radiosurgery with a high degree of success. Its results have revolutionized the treatment of brain disorders.

# understanding **The Procedure**

The Gamma Knife may be used to treat patients with a variety of brain diseases such as brain tumors, abnormal clusters of blood vessels (AVM), and certain facial pain disorders. A more complete list of such disorders is noted below.

## **INTRACRANIAL TUMORS**

- Acoustic neuroma
- Arteriovenous malformation (AVM)
- Benign or malignant gliomas as part of primary management or treatment for recurrent tumors
- Carcinoma of the nasopharynx
- Cavernous malformations
- Chordoma
- Chondrosarcoma
- Craniopharyngioma
- Eye and orbital tumors
- Glomus tumors
- Hemangioblastoma
- Hemangiopericytoma
- Meningioma
- Metastasis
- Pineal tumors

- Pituitary tumors (both non-functional and secretory)
- Schwannoma
- Tumors of the cavernous sinus
- Other less common benign and malignant tumors

## **FUNCTIONAL DISORDERS**

- Trigeminal neuralgia
- Parkinson's Disease refractory to other therapies
- Essential tremor refractory to other therapies

Selection of patients for Gamma Knife surgery involves an interdisciplinary team of neurosurgeons, radiation oncologists and other specialists. Selection is made on the basis of a diagnostic examination, imaging studies, tissue diagnosis and the patient's general health and age. Patients may be eligible for Gamma Knife treatment even if they previously had open brain surgery, radiation therapy, chemotherapy, or in the case of AVMs, embolization procedures.

## YOUR pre-admission testing appointment

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A full set of studies, including blood testing, electrocardiography, chest X-rays and possibly preoperative medical clearance will be ordered for you. These will be scheduled in coordination with your primary physician.

During your pre-admission testing appointment, you will have the opportunity to meet your treatment team and tour the Gamma Knife Center. The pre-admission appointment is usually scheduled within two days of your procedure.



## the day before YOUR procedure

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You will be asked to not eat or drink any food or water after midnight the evening before your admission. You may brush your teeth and rinse your mouth, but do not swallow the fluid.

You will be also asked to take a shower and shampoo your hair using an antimicrobial cleanser. A prescription for this shampoo will be given to you on your pre-admission testing day.

# the day of **YOUR** procedure



Please remember to take your regular medications with small sips of water the morning of your radiosurgery. Please leave any valuables such as jewelry or your wallet at home or with your family for safekeeping. Patients generally arrive at the Gamma Knife Center the morning of the procedure.

When you arrive, you will first register at the Admitting Department in the main lobby of the hospital. Your nurse coordinator will greet you and answer any questions you may have. Once in the Gamma Knife Center, you will receive an intravenous line (IV) for hydration and medication throughout the day, as well as be asked to change into a hospital gown. Unlike conventional surgery, you may wear your undergarments, pajama bottoms and socks.

You will be attached to vital sign monitors to check your blood pressure, heart rate, rhythm and oxygen level during the procedure. A stereotactic head frame will then be applied. This frame allows the doctor to accurately pinpoint the target to be treated in your brain. The lightweight frame is attached to your head with four tightening pins and prevents your head from moving during the procedure, but until that time you will still be able to move your head. Local anesthetic is applied where the pins are placed. You may feel light pressure from the head frame. This should subside within 15 - 20 minutes.



## Imaging & Treatment planning

A MRI, CT or cerebral angiography scanning procedure will be performed. This pinpoints the location, size, shape, and position of the lesion.

Based on these images, the team uses a three-dimensional model to define the precise target area. The procedure involves a number of specialists including a Neurosurgeon, Radiation Oncologist and Medical Physicist all working as a team. This advanced dose-planning program takes less than one hour to complete. During this time, you will be able to watch TV, rest or visit with family. While you wait in the Gamma Knife Center, the head frame must remain on.

# Gamma Knife procedure



Once a dosing plan has been established, the physician will connect your head frame to the collimator helmet, a colander shaped bowl, which the medical team will secure to the Gamma Knife table. The helmet contains 201 precision holes through which the radiation beams will pass. The team will continue to monitor your vital signs. A microphone within the collimator helmet, allows you to speak to the team at any time.

During the treatment procedure, your physician will operate the Gamma Knife from a room connected to the treatment room and will interact with you using the cameras and microphones. When your physician activates the Gamma Knife, the bed you are lying on will glide into place to allow the radiation to be delivered to the target area. After the dose of radiation, the bed will slide out of the Gamma Knife unit. The number of minutes that each radiation dose lasts is determined during dose planning and depends upon the size, shape and location of the target area.

The procedure usually includes multiple doses that are delivered one after the other, all on the same day. The bed may move and your head position may be adjusted for the each dose of radiation.

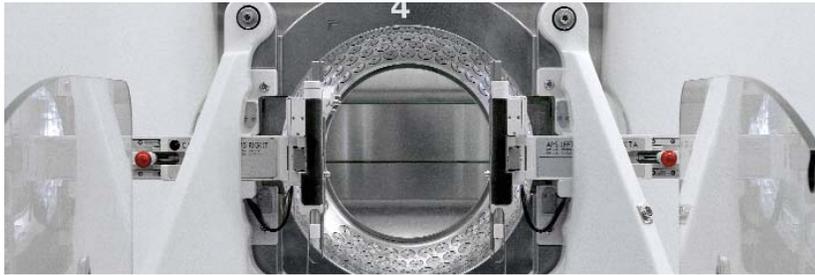
The procedure is quiet and painless. You may even bring your own CD's to listen to during the treatment, which could last a few minutes to about an hour.



after **YOUR** treatment

When your treatment is complete, the collimator helmet and head frame will be removed and an antibiotic ointment will be applied to the pin sites. Your physician will determine if you should stay in the hospital overnight or if you can go home. The benefits of treatment will appear over time, most lesions slowly decrease in size and dissolve or exhibit no further growth.

Your nurse for the day will discuss any follow-up plans including medications and subsequent physician appointments prior to your discharge.



The Gamma Knife has emerged as one of the most important innovations in treating illnesses in the brain, and its clinical applications continue to grow. Many new applications are being investigated. Please ask your physician to identify whether Gamma Knife may be appropriate treatment for you.

This state-of-the-art tool is positioned to be the state-of-the-future, as well.

Groundbreaking medical advances are the result of new ideas and approaches developed through clinical research. Northridge Hospital remains on the forefront of the latest research developments by participating in clinical research opportunities and partnering with the nation's most credible institutions.



# frequently asked Questions



## 1 Why is it called a Gamma Knife?

The Swedish inventor, Professor Lars Leksell, coined this term because the machine utilizes gamma radiation from a cobalt source to destroy tumors or treat other brain pathologies. It acts like a surgeon's scalpel, thus "the Knife" has the ability to precisely conform the radiation to a tumor shape.

## 2 How long has the Gamma Knife been available?

More than 25 years of technical evaluation support the Gamma Knife. The Gamma Knife was invented in 1968 in Sweden where the first clinical treatment was delivered. The first U.S. unit was installed in 1988 at the University of Pittsburgh.

## 3 Can Gamma Knife be used in any other parts of the body besides the brain?

We can treat certain head and neck tumors, but the Gamma Knife cannot treat any pathology below the neck.

## 4 What are the side effects of the Gamma Knife?

Because there are no incisions during the procedure, the risk of infection, bleeding or spinal fluid leak is almost completely eliminated. The possibility of injury to nearby nerves and brain structures is minimal, but will be discussed by your physician prior to radiosurgery. Typical side effects of radiation treatment, such as hair loss, weakness and seizures are normally avoided, but may possibly occur. Many of these are temporary and can be controlled by medicine.



## 5 What are the advantages of the Gamma Knife procedure versus traditional brain surgery?

- Gamma Knife is a neurosurgical tool specifically designed for the exclusive treatment of brain disorders and brain tumors previously considered untreatable by surgery.
- The lesion being treated receives a high dose of radiation with minimum risk to nearby tissue and structures.
- The cost of the Gamma Knife procedure is often 25 to 30 percent less than traditional neurosurgery. Multiple visits to the hospital, operating room and post-operative intensive care costs are not incurred.
- Patients experience little discomfort and have minimal recovery time.
- There is no risk of hemorrhage and infection which can be caused by an incision.
- Hospitalization is short, typically an overnight stay, if at all.

## a premiere **Medical Center**

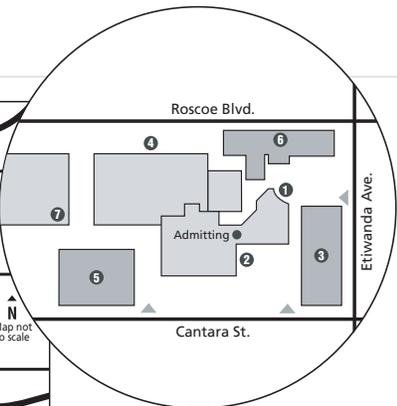
**Northridge Hospital Medical Center** has been caring for families like yours since 1955. Northridge Hospital is the most comprehensive medical and diagnostic hospital in the San Fernando Valley. In times of critical medical need, Northridge Hospital offers numerous Centers of Excellence:

- A **Level II Trauma Center & Heliport**, one of only two hospitals in the San Fernando Valley equipped to treat traumatic and life-threatening injuries. The **Emergency Department** treats over 55,000 patients each year.
- The award-winning **Thomas & Dorothy Leavey Cancer Center** is fully accredited and boasts the most inclusive, technologically-advanced treatment in the Valley.
- The **Center for Rehabilitation Medicine** offers treatment for all major disabling conditions including spinal cord and brain injuries, stroke, multiple trauma, neurological disorders, arthritis, and orthopedic problems.
- The choice of more than 10,000 individuals each year, the **Surgical Center & the Weiland Ambulatory Surgery Center** features 14 operating rooms and specialty suites for cardiovascular services, endoscopic procedures, vascular cases, cancer, and many more.

Other pinnacle services at Northridge Hospital include: Adult, Neonatal and Pediatric Intensive Care Units, Babies First Obstetrics, Behavioral Health services, Center for Surgical Weight Loss Surgery, Gamma Knife Center, Heart and Vascular Center, Integrative Medicine, Sleep Evaluation Center, and the Carole Pump Womens Center.

what's on **YOUR** mind?





- 1 Main Hospital Entrance
- 2 Emergency & Trauma Entrance
- 3 Main Parking Structure
- 4 Cancer Center & Ambulatory Surgery Center Entrance
- 5 West Parking Structure
- 6 Women's Center & Center for Rehabilitation Medicine
- 7 Gamma Knife Center - entrance is on the exterior of the medical building



Northridge Hospital  
Medical Center

CHW

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