

Gamma Knife® Radiosurgery for AVM

Welcome to Northwestern Memorial Hospital's Gamma Knife Center. Please take a few minutes to review this brochure. It will assist you in preparing for your Gamma Knife surgery.

What is the Gamma Knife?

The Gamma Knife is not actually a knife at all. Rather, it is an instrument that uses targeted radiation to perform brain surgery. The Gamma Knife allows the doctor to focus 201 beams of radiation just on the area being treated. Alone, each beam is too weak to cause any damage to the normal brain tissue. The Gamma Knife is extremely precise. It uses 3-D planning to shape the radiation dose to the size and shape of the affected area. The Gamma Knife is used only on the brain. It is used to treat:

If you have any questions, please ask your doctor or nurse.

Brain Tumors

- Acoustic neuroma/schwannoma
- Glial tumors/primary brain tumors
- Meningioma
- Metastatic brain tumors
- Pituitary tumors
- Skull-based tumors

Functional Disorders

- Trigeminal neuralgia
- Parkinson's disease
- Epilepsy

Vascular Disorders

- Arteriovenous Malformation (AVM)

In most cases, only 1 Gamma Knife treatment session is needed. The treatment begins early in the morning and lasts most of the day. It involves 4 phases:

- Head frame placement
- Imaging (MRI, angiogram)
- Planning
- Treatment

The Gamma Knife Team

The Gamma Knife team consists of a neurosurgeon, radiation oncologist, radiation physicist and registered nurse. Together, the team provides care tailored to your specific needs.

Before Surgery

Certain blood tests must be done prior to the Gamma Knife treatment:

- Complete blood count (CBC) with platelets
- International normalized ratio (INR)
- Partial thromboplastin time (PTT)
- Prothrombin time (PT)
- Chemistry panel

Please arrange to have the blood test results sent to the Gamma Knife Center:

Gamma Knife Center
251 East Huron Street, Galter Pavilion, L-178
Chicago, Illinois 60611
Fax: 312.926.6845

The Gamma Knife nurse meets with you or calls you at home. Talk to the nurse about any allergies (including iodine or X-ray contrast) and your current medications. Check which medicines may be taken on the day of “surgery.” The nurse will also review what to expect on the day of treatment including:

- Head frame placement
- Imaging studies including angiogram
- Gamma Knife treatment
- Treatment planning
- Head frame removal

The nurse also:

- Answers any questions that you may have.
- Collects your insurance information. (Pre-certification of insurance coverage is needed.)

Night Before Surgery

Do not have anything to eat or drink after midnight the night before your procedure. Any needed medicine may be taken with sips of water.

Day of Surgery

On _____ plan to arrive at 6:30am, unless instructed otherwise.

- As directed, take needed medicines with sips of water.
- Wear comfortable clothing.
- Do not wear any makeup.
- Leave all valuables at home, including jewelry.

Be sure to bring:

- A list of allergies (including iodine or X-ray contrast)
- A list of all your current medications (prescription, over-the-counter, and herbals)
- Photo ID
- Medical insurance information
- Medicare card (Medicare patients only)

You may wish to bring a device such as a smartphone or iPod® to listen to music while waiting or during treatment.

Please come to the Galter Pavilion, 201 East Huron Street. Parking is available for patients and visitors in the garage at 222 East Huron Street, across from the Feinberg and Galter pavilions. For discounted rates, please bring your parking ticket with you. Tickets can be validated at the Customer Services Desks on the 1st and 2nd floor of the Feinberg and Galter pavilions, and the 1st floor of Prentice (including the Prentice 24-hour desk near the Superior Street entrance).

It is important that you:

- **Check in at the reception desk on the 4th floor (located between Feinberg and Galter pavilions).**
- **Tell the receptionist that you are having Gamma Knife surgery.**

The nurse from the Gamma Knife Department will meet you to escort you to the Radiology holding area. Only 2 family members may accompany you to the Radiology holding area because of limited space.

Head Frame Placement and Imaging

When you arrive in the Radiology holding area, you are asked to change into a hospital gown.

The nurse reviews the procedure with you, answers any questions and shows you the Gamma Knife head frame in detail. You are asked to sign consent forms. An IV (into the vein) line is inserted. The IV is used to give contrast (dye) and fluids during the surgery.

The doctor reviews your medical history and does a short physical exam.

The neurosurgeon then places the Gamma Knife frame on your head. The frame has special “markers” on its surface. These markers are used to map the exact location of your Gamma Knife surgery.

The frame is held firmly in place by 4 pins: 2 on the forehead and 2 on the back of the head. No hair is shaved from your head and no incisions are made. Your pin sites are cleaned with alcohol and numbing medicine is injected into the area. This assures comfort during the frame placement. You will feel pressure as the pins are put in place. This is normal, and the pressure does subside. The frame remains on your head until after your surgery.

When the head frame is in place, a magnetic resonance imaging (MRI) scan is done. A computed tomography (CT) scan may be done instead if you have metal in your body, such as a pacemaker or ear implants.

Next, the angiogram is done in Interventional Radiology. Once completed, the nurse takes you on a stretcher to the Gamma Knife Center in the Radiation Oncology Department. Most patients will need to lie flat for the next 6 to 8 hours. During this time, the nurse checks the puncture site along with your blood pressure and pulse.

Planning Phase

When you arrive in the Gamma Knife Center, the planning phase begins. The Gamma Knife team uses a computer to plan your specific radiation treatment. The planning phase may take an hour or more, depending on the size and shape of the area being treated. During this time, you will be made comfortable in the Gamma Knife Center and your family is welcome to wait with you.

Surgery

After the planning phase, the treatment or surgery phase starts. The nurse helps you lie on a special bed. The team positions your head to direct the radiation to the targeted area of your brain. When your head is in the correct position, the team makes you as comfortable as possible. Then, because of the radiation, the team must leave the room. During the Gamma Knife treatment:

- You are able to talk to the doctor or nurse by a 2-way intercom.
- Your blood pressure and heart rate are checked.
- You are able to listen to music.

Surgery time varies based on your specific treatment plan.

After Surgery

When your treatment is over, your doctor removes the head frame. Antibiotic gauze and bandages are applied to each pin site. Some patients may have slight bleeding at the pin sites. Applying pressure almost always stops the bleeding.

You may have a headache from the frame removal. Your nurse can give you medicine for the pain. You may also have swelling above your eyes. This is caused by the numbing medicine used during the frame placement. The swelling lasts only a short time. Your nurse will apply ice packs to your forehead to help prevent the swelling. It is important to continue to use the ice packs after you go home. Please arrange for someone to drive you home after the surgery.

Follow-Up Care

Before you leave the hospital, specific discharge instructions are given based on your diagnosis. This will also include guidelines for care after an angiogram. The full effects of Gamma Knife surgery do not happen right away, which makes follow-up care very important. This care includes doctor visits and imaging studies such as MRI or CT scans. Please call your Gamma Knife neurosurgeon's office at 312.695.8143 to make your follow-up appointments as instructed.

When to Call the Doctor

A small number of people have side effects from Gamma Knife surgery.

Call your doctor if you have:

- New onset of severe headaches
- Weakness in your arms or legs
- Numbness
- New seizures
- Vision changes

There is some risk with every surgery. The risk varies with each person and the problem being treated. The risks of Gamma Knife surgery are low compared with traditional brain surgery. Most side effects are temporary. Your surgeon will discuss the benefits and risks involved in your surgery with you. Please ask your doctor if you have any questions or concerns.

We Welcome Your Questions

We are happy to talk with you and answer your questions about Gamma Knife surgery. The Gamma Knife nurses are on hand to talk with you on weekdays between 8:30 am and 4:30 pm. Please call us at 312.926.5070.

Northwestern Medicine – Health Information Resources

For more information, contact Northwestern Memorial Hospital's Alberto Culver Health Learning Center (HLC) at hlc@nm.org, or by calling 312.926.5465. Health information professionals can help you find the information you need and provide you with personal support at no charge.

For more information about Northwestern Medicine, please visit our website at nm.org.

Para asistencia en español, por favor llamar al Departamento de Representantes para Pacientes al 312.926.3112.

The entities that come together as Northwestern Medicine are committed to representing the communities we serve, fostering a culture of inclusion, delivering culturally competent care, providing access to treatment and programs in a nondiscriminatory manner and eliminating healthcare disparities. For questions, please call either Northwestern Memorial Hospital's Patient Representatives Department at 312.926.3112, TDD/TTY 312.926.6363 or the Northwestern Medical Group Patient Representatives Department at 312.695.1100, TDD/TTY 312.926.6363.

Developed by: NMH Gamma Knife Department

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