

# Gamma Knife Center



**PATIENT  
EDUCATION**



## **Gamma Knife Center**

Welcome to the Gamma Knife Center at Roswell Park Comprehensive Care Center. This brochure describes the Gamma Knife procedure and answers the most frequently asked questions about that treatment. Please take a few minutes to read it carefully. The Gamma Knife team at Roswell Park is dedicated to ensuring your comfort. Please call us if you have any further questions or concerns.



### **The Gamma Knife**

The *Gamma Knife ICON* is a sophisticated radiosurgical device that delivers highly focused beams of radiation emitted from 192 cobalt-60 sources to treat targets within the patient's brain and/or cervical spine. The Gamma Knife enables doctors to treat deep-seated intracranial lesions without the risks often associated with open-skull surgery. Gamma Knife treatment requires no incision, causes minimal discomfort, and reduces the risks for the patient compared to conventional neurosurgery.

## **Your First Visit**

During your first visit to the Gamma Knife Center, your neurosurgeon and radiation oncologist will:

- review your computed tomography (CT) and/or your magnetic resonance imaging (MRI) scans
- review any available angiograms
- obtain information regarding your medical history
- perform a neurological examination

The Gamma Knife procedure will be discussed with you and your family and you will have an opportunity to ask questions. Before you leave, you will be asked to sign an informed consent and possibly take a simple blood test.

## **The Day Before Treatment**

- You will receive instructions about a week before treatment regarding what time to report to the registration desk.
- You must not eat or drink anything after midnight the night before your treatment to reduce the chances of having an upset stomach during treatment.
- Be sure to ask your doctor or nurse about taking prescribed medications by mouth on the day of your Gamma Knife treatment. Generally, if you take heart, blood pressure, or seizure medications, you will be permitted to take these with a sip of water in the morning.

## Treatment Day

- A family member or friend must accompany you to Roswell Park.
- Please check in at the Registration Desk in the lobby. After you have been admitted, you will be directed to the Radiation Medicine Department.
- When you arrive, you will be asked to remove jewelry, wigs or hairpieces, eyeglasses or contact lenses, dentures and any other prostheses.
- After you empty your bladder, you will be given a gown to wear. (Note that premenopausal women will be required to provide a urine sample upon arrival to rule out pregnancy.)
- An intravenous (IV) line will be started in your arm so that you can receive fluids and medications during the procedure.
- The nurse who will care for you during the procedure will greet you and make you comfortable.



### Localizing Frame

For the Gamma Knife beams to be focused precisely on the lesion in your brain, a square localizing frame will be placed firmly on your head. This frame will be held in place by four titanium pins—two in the front and two in the back—which press against, but do not penetrate, your skull. This frame will remain in place throughout your treatment.

- Before the frame is positioned, the front and back of your head will be cleaned with an alcohol wipe. If you have long hair it will be tied back.
- Local anesthetic, similar to that used by your dentist, will be injected at each pin site to numb the skin.
- The titanium pins will be adjusted to hold the frame in place. You may feel the sensation of a rubber band encircling your head for 5-10 minutes. After that, you should feel no discomfort.
- When the frame is positioned, a clear plastic helmet which has small holes will be placed over the localizing frame. Measurements of your head will be taken with a special ruler and recorded. The plastic helmet will then be removed.



### **Thermoplastic Mask**

If your physicians determine the need to deliver the treatment with the Gamma Knife in more than one session (may be as many as 5 treatments), then they will choose to immobilize you for the treatment with a molded plastic mask instead of the frame.

When the mask is used it will require that they monitor your position with a reflective marker placed on your nose and tracked by the computer. If this option is applicable for you, we will discuss it with you. If you have

a mask, you will have the following during your first visit, before you have your first treatment:

- The mask will be made
- You will have a planning MRI
- You will have a CT scan on the ICON itself (called a Cone Beam CT scan)

## **Planning**

With the localizing frame positioned, imaging studies will be done to help your neurosurgeon and radiation oncologist plan your treatment. You will be taken to Diagnostic Imaging on the second floor for these studies. If you have a brain tumor, MRI, and/or CT scans will be done. MRI may not be possible if you have any metal in your body (e.g., pacemaker, artificial hip prosthesis, cerebral aneurysm clips). In such cases, a CT scan can generally be used.

If you have an arteriovenous malformation (AVM), an angiogram will be done in addition to MRI and/or CT scans. For the angiogram, the localizing frame will be connected to the bed of the angiogram unit. You will receive a local anesthetic and a catheter will be inserted into an artery in your groin. The catheter will be directed through an artery leading to your brain and contrast dye will be injected. A series of x-ray pictures will be taken to show the blood vessels within the AVM.

Results of these imaging studies will be transferred to the Gamma Knife treatment planning computer. Your

neurosurgeon and radiation oncologist will use this computer to develop your treatment plan. This process may take several hours. During this time you will be able to visit with family or friends in the day hospital area in the Gamma Knife suite.

## **Treatment**

When your treatment plan has been developed, you will be taken to the Gamma Knife unit. You will be asked to lie on the couch while your physician positions your head. When you are comfortable, your physician will leave the room and administer the treatment from a control panel in another room. You will be observed during the procedure on closed-circuit television and will be able to talk to your physician through a microphone attached in the Gamma Knife helmet.

When treatment begins, the doors on the Gamma Knife unit will open and the couch will move you slowly into the unit. During treatment, you will be able to see out of the unit and you will not feel or hear anything. At the end of the treatment, the couch will automatically move you out of the unit and the doors will close.

The length of your treatment session depends on your exact condition and may range from 10 minutes to 2 hours or more.



If you are scheduled for multisession mask-based treatments the subsequent treatments require re-positioning of the mask on your face and obtaining a new Cone beam CT each time – the plan, however, remains the same as the first day.

### **Following Treatment**

- When your treatment is completed, the localizing frame will be removed.
- If there is bleeding at any of the pin sites, direct pressure will be applied. In the unlikely event that bleeding persists, your neurosurgeon will apply a stitch to close the pin site.
- Pin sites will be covered with a small bandage for 24 hours.
- You will return to your room in the day hospital for a short period of observation before you are discharged.
- If you develop a headache or become nauseous, tell your nurse. Medications ordered by your physician can be given to relieve these symptoms.
- Your IV will be removed when you are able to take fluids by mouth.

## **Discharge Instructions**

All patients will be discharged after a short observation period following the Gamma Knife procedure. Follow-up appointments will be coordinated with your neurosurgeon and radiation oncologist for 2 to 12 weeks after your procedure, depending on your diagnosis.

Other than mild nausea and/or headaches, there are no side effects from Gamma Knife treatment. However, if the condition being treated is near the surface of the brain, some patients may lose a patch of hair, which usually grows back within 3 months.

Some patients also have temporary numbness and tingling of the scalp near the pin sites which are almost always gone within a few weeks to months.

Pin sites should be kept clean and a small bandage should be reapplied if any oozing of blood occurs. You can shampoo your hair the day following treatment, but do not scrub the pin sites vigorously. Stitches, if any, will dissolve in 7 to 10 days. Within 1 to 2 weeks, the pin sites should be completely healed. A follow-up call will be made the next business day after treatment.

## **When to Notify Your Physicians**

If any of the following symptoms develop after your Gamma Knife treatment, please call your doctor immediately.

- Swelling at pin sites, redness, oozing or drainage after the first 48 hours
- Fever of 100°F (38.5°C) for 24 hours or longer
- Numbness or weakness in face or limbs, speech difficulties, new neurological symptoms
- Severe headaches or vomiting
- Seizures

