

Pre-Treatment Instructions

Gamma Knife Treatment Date: _____

Time to report: _____

Neurosurgeon: Dr. _____

Radiation Oncologist: Dr. _____

- o **Nothing to eat or drink after _____**
or
- o **Eat light, minimize caffeine beverages**

Lab Work Needed	
Medications to take in the morning	

Who to contact if you have any questions or concerns:

*Please call the Gamma Knife Nurse at **454-6600, ext. 80300**. If he is unavailable at the time of your call, please leave a message including patient's name, phone number, time of call and the reason for your call. Your call will be returned promptly.*

Sutter Gamma Knife Center
2800 L Street, Sacramento CA 95816
(888) 287-2270 Administration Office • (916) 454-2222 Hospital Operator



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Patient Handbook

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Welcome **to the** **Sutter Gamma Knife Radiosurgery Center**

Physicians and nurses compiled this handbook to prepare you for your upcoming Gamma Knife surgery. This handbook contains information about what to expect before, during, and after the actual Gamma Knife procedure. We want you to have as much information as possible to ensure that you are aware of every aspect of the procedure and to encourage you to ask questions. This book is meant to add to, not replace discussions with your doctor. We encourage you to share this book with those close to you as they may have questions regarding the procedure as well.

The patient handbook is divided into eleven (11) sections. Its intentions are to explain the steps along the way during your treatment. Some of the information contained in the handbook may contain more detail than you require at this point, but please keep the book with you. You may have questions and/or concerns later and it will be a handy resource tool for you. Remember that there are no “*dumb*” questions, we are happy to answer any and all questions you have to the best of our ability.

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Gamma Knife History and Benefits

Stereotactic radiosurgery technology was developed in the 1960's by Swedish neurosurgeons Lars Leksell and Borje Larrson. Sometimes dubbed the "*Gold Standard*" for radiosurgery, the Gamma Knife precisely aims 201 individual radiation sources of cobalt-60 at a brain lesion. The area(s) to target is identified by overlaying images that may include magnetic resonance imaging, computed tomography, position emission tomography, and angiography studies. Computer assisted planning allows the treatment team to narrow the target field with a precision of 1 mm or less. Such precision is not possible with any other radiation modality and is especially useful for sites that may be near critical brain functions or deep within brain tissue.

Gamma Knife has extremely favorable results when treating such indications as arteriovenous malformations (AVMs), small benign tumors, and brain metastases.

Benefits of treating with Gamma Knife when indicated as the treatment option of choice include:

- Greater precision
- Ability to reach deep-seated lesions with less risk than open brain surgery
- Ability to treat multiple small lesions in one session
- Virtually painless
- No blood
- Fast recovery
- Reduced hospital stays (often times none)
- No hair loss
- No risk of infection or surgical complications
- Well-documented outcomes
- No general anesthesia in most cases
- One treatment session (although more than one is possible)

The Gamma Knife Team

At this time, we'd like to introduce you to the Gamma Knife team. The team consists of several key members who you will meet during your treatment. The Gamma Knife team consists of:

- Neurosurgeon
- Radiation Physicist
- Radiation Oncologist
- Neuro Radiologist
- Nurse
- Anesthesiologist

Pre-Treatment Preparation

You and your doctor have determined that Gamma Knife is the best option for treating your condition. You can help to make the procedure a success by preparing for it mentally and physically. This includes planning for your surgery and having realistic expectations. Having any type of surgery can be stressful, Gamma Knife is no exception, but you can minimize much of the stress by planning.

Transportation

Determine who will be driving you to and from the clinic. Because many Gamma Knife patients are treated and return home on the same day, it is important to identify all aspects of transportation prior to the procedure.

Home Care

Because most people treated by the Gamma Knife are able to return home the same day as the procedure, you will want to make sure you have someone staying with you for the first day or so after the procedure. Someone needs to help take care of the day to day things that need to happen so that you can rest.

Eating

Do not eat or drink anything after midnight the night before radiosurgery unless otherwise instructed. This will decrease the chance of stomach upset during the procedure. Minimize or eliminate beverages containing caffeine the morning of the procedure.

Medication

Please discuss ALL medications you are taking with the Gamma Knife Team. Heart or blood pressure medications can be taken with a small amount of water on the morning of the procedure.

Lab Test

You may require some blood work prior to the Gamma Knife procedure; you will be instructed on this.

Hair

Wash your hair the night before. Avoid using hairspray or gels.

From Out of Town

The Gamma Knife nurse can assist you if you or family will be traveling here from out of the area and will need lodging accommodations. Many local hotels offer discounted rates while patients are being treated at the hospital.

A major benefit of Gamma Knife radiosurgery is that you will be able to return to your normal daily activities quickly. But some planning prior to the procedure is helpful. Consider what you will need after the procedure when you return home. Plan ahead, shop for groceries, make sure clean clothes are available, get help for the kids and pets. Take a day to relax without the worry of having to take care of the everyday details. Thinking ahead will make your recovery at home much easier.

The Day of Your Gamma Knife Procedure

Plan on arriving 15-30 minutes before your prearranged scheduled time to allow extra time to park your car and relax for a few minutes before you begin the procedure preparation process.

On the morning of your procedure, you will need to remove all jewelry, eyeglasses, contact lenses, wigs or hairpieces, dentures, and any metal objects in your pockets. For women, please do not wear makeup or nail polish. For men, please leave your wallet with your family. Please leave any valuable items at home, including jewelry. We can not be responsible for those items.

After you have been admitted for the program an intravenous catheter (I.V.) will be started in a vein in your arm so that you can receive fluids and medications during the procedure. Often times, patients indicate that the medication administered gives them a *dry mouth*.

We recommend that a family member, significant other or someone important to you accompany you on the day of the procedure. This person(s) should stay on-site for the duration of the procedure. A member of the Gamma Knife team will contact them to provide a status report during and after the procedure is completed.

Placing the Stereotactic Frame

To ensure that the Gamma Knife beams are focused on the area of the brain to be treated, a piece of equipment called the Leksell stereotactic head frame is fixed firmly to your skull. This device is shaped like the outline of a box and is called a stereotactic frame. Prior to the frame being placed, the nurse may give you medication to help you relax. The frame is held in place on your skull with four pins, two in the forehead and two on the back of the head. Before the frame is secured your physician will inject some local numbing medication (anesthesia) where the pins will be inserted. If you have long hair, your hair will be tied back, but no hair will be shaved off.

When the pins are inserted, you will feel pressure but should not have pain. Patients find this pressure to be a little uncomfortable, but it does not last for long. Anesthetic is used so you will have very little discomfort. The stereotactic frame will stay on your head until your Gamma Knife treatment is complete.

Imaging Before the Procedure

After the head frame is in place, you will have an imaging study done to localize the area to be treated and help assist the Gamma Knife team plan your treatment. The Gamma Knife nurse will accompany you to the imaging center. After the process is complete the nurse will escort you back to the Gamma Knife suite. All patients have either an MRI or CT scan to start with pre-planning.

If your condition requires you to have an angiogram, the head frame will be attached to the bed of the x-ray machine and a catheter will be inserted into the artery in your groin after local numbing medication is injected. Remember, your groin area has already been shaved for this procedure. The catheter will be directed to your brain, contrast dye will be injected, and x-rays will be taken of where the dye goes in the blood vessels in your brain.

Imaging Before the Procedure (continued)

Once the MRI, CT scans and/or angiogram is complete, the planning process begins. With results from the imaging your physicians will now map out your treatment plan. This plan includes but is not limited to: number of radiation shots you will receive, dosage of radiation per shot, and location of shot(s). During this planning time, you will remain in the Gamma Knife treatment area usually in an exam room. Members of the team will help you remain as comfortable as possible. The Gamma Knife nurse will monitor your heart rate and blood pressure. You may listen to music of your choice; some patients even sleep during this waiting period. **The planning process may take up to two hours for the team to review the imaging test results and to then determine your treatment. You will be updated during your wait on how soon your treatment will commence. This may seem to be a lengthy period of time but is crucial to your treatment.**

The Gamma Knife Procedure

Once final plans have been made for administering your treatment, you will be taken into the Gamma Knife suite and positioned so that the head frame maintains your head steadily and securely in the Gamma Knife helmet. Once you are interlocked with the Gamma Knife helmet, you are now ready for your treatment.

The Gamma Knife team caring for you will exit into the outer section of the Gamma Knife suite and your treatment will be administered. They leave the room because staying with every patient creates a high risk of exposure to radiation over an extended period of time. You will be able to talk with the team via a microphone located inside the Gamma Knife helmet. There are also three cameras in the suite which allow the team to see you at all times.

The Gamma Knife bed will move into the treatment position, you will hear a click as the helmet locks into position and the ports on the helmet will open to allow the radiation to pass through. After this point, you will not hear or feel the treatment. When the treatment is complete, the bed will be moved to its original position. The number and length of treatments given depends on your condition. You will be informed of how long each treatment will take prior to the team exiting the room. Your arms may be secured to prevent you from reaching up as the table moves you in and out of the Gamma Knife unit.

After Your Treatment

When your treatment session is finished, the stereotactic head frame will be removed. Sometimes there is a little bleeding from where the pins were attached to your head. Gauze and pressure will be applied to stop the bleeding and to keep the area clean. In some cases, the bleeding doesn't stop without the help of a single stitch or staple. You will have small band-aids placed on your forehead where the pins were originally.

Take it easy over the next 12 – 24 hours. Take this time to relax and fully recover.

“How Should I Feel After the Treatment?”

Some patients have a headache or feel nauseated for a few hours after the treatment. If this happens speak with your Gamma Knife nurse. Your nurse can give you medication ordered by the doctor to relieve these symptoms. When you are able to drink fluids, your I.V. line will be removed.

Discharge Instructions

In most cases, patients are able to leave the clinic the same day as the Gamma Knife procedure. Your follow-up care will be coordinated among the doctor who referred you for treatment, the treating neurosurgeon, radiation oncologist and you.

If a staple or stitch was used to close a pin site, it will need to be removed three to five days after treatment. This can be done by your primary care doctor or the doctor who referred you for treatment. If you are discharged on the same day as your treatment, you should have someone else drive you home. You should have someone stay with you your first night home as well.

Resume taking medications prescribed by your doctor before your Gamma Knife treatment, unless your doctor indicates otherwise. You also may have been instructed to take some new medications for a period of time after treatment.

The sites where the head frame was attached should be kept clean. You can do this by gently washing the areas with a mild soap and/or applying Neosporin several times a day for 3-5 days. You can shampoo your hair the day after treatment but do not scrub the pin sites. Some patients have noticed slight numbness or tingling of the scalp near the pin sites. This feeling is normal, temporary, and is gone within a few months. You may use ice packs to the pin sites which are tender or for the swelling as needed.

You may have some swelling of the eyes or eyelids or even bruising which is secondary to the local numbing medication and will resolve on its own.

Side Effects

Let's talk about side effects. As with any operation, there are some long-term risks after Gamma Knife surgery. For the most part, the greatest side effects patients have indicated are headaches and nausea within 24 hours of treatment. Both are short term and you will have something ordered if needed.

Depending on size, shape, and location of the particular problem you are being treated for, we especially want to know if you experience any side effects. Your physicians will follow your treatment closely and carefully. You will have physical exams and imaging studies to monitor the benefits of the treatment and also to detect any possible side effects. You may also be instructed on lab test(s) required, especially if you are on medication after the treatment.

If you have questions regarding side effects after your treatment, please call the Sutter Gamma Knife Center and ask to speak with the Gamma Knife nurse. The nurse is best equipped to either answer your question directly, or direct your question to the appropriate person. You can reach the Sutter Gamma Knife Center toll free at 1-888-287-2270, Monday – Friday 8 a.m. – 5 p.m. Please feel free to leave a message if you call after hours. If you have an emergency please call your physician for guidance.

When to Call Your Doctor

If you develop any of the following symptoms after you are discharged, please call your doctor immediately:

- **Severe bruising or swelling at your pin sites**
- **Fever of 102.5 F (38.5 C) for 24 hours or longer**
- **Blackout, fainting, falling episode, or a blow to the head**
- **Numbness or weakness in your face or limbs, balance problems, prolonged headache, or seizure.**

Most problems are rare and unusual but occasionally develop later between 4 and 18 months after Gamma Knife surgery.

Effective Treatment Occurs Over Time

Gamma Knife surgery never results in immediate destruction or eradication of the problem you are being treated for. Rather, the effects are cumulative and take effect over time. For this reason, you must have evaluation and imaging at regular intervals to check how your situation is responding to the Gamma Knife treatment. The schedule for your evaluations and ongoing imaging will be determined for you by the neurosurgeon and radiation oncologist who delivered the Gamma Knife treatment and may be coordinated by your primary care physician. These follow-up appointments are absolutely necessary. If you do not live in the Sacramento area, arrangements should be made with your doctor to have copies of the actual films of all imaging studies sent to the Sutter Gamma Knife Center. The Gamma Knife team must obtain appropriate follow-up to advise you of the results of treatment.

FOLLOW-UP PLAN

Take the following medications:

- 1)
- 2)
- 3)
- 4)
- 5)

Schedule a follow-up visit with Dr. _____ in _____ weeks.

Prior to your visit with the doctor, a _____ scan will need to be done.

Please call _____ to schedule the scan and follow-up.

If you are from out of the Sacramento area you will be instructed who will follow you and order any new studies.

Who to contact if you have any questions or concerns:

*Please call the Gamma Knife Nurse at **454-6600, ext. 80300**. If he is unavailable at the time of your call, please leave a message including patient's name, phone number, time of call and the reason for your call. Your call will be returned promptly.*

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