

# A SAFE, NON-INVASIVE TREATMENT OPTION: GAMMA KNIFE PERFEXION



Not actually a knife, the Gamma Knife Perfexion is an advanced radiosurgery device which uses extremely precise beams of radiation to treat diseases or abnormalities in and around the brain, all without a single incision. Performed in a one outpatient treatment session without the need for general anesthesia, this proven technology provides patients with non-invasive alternative or supplemental therapy to open surgery or other methods for a variety of brain diseases.

Backed by over 40 years of clinical use and research, including the more than 3,000 peer-reviewed clinical studies, the Gamma Knife is considered the “Gold Standard” of radiosurgery treatment techniques for brain diseases to which all other devices are measured. More than 700,000 patients have been treated worldwide at over 200 different Gamma Knife Centers.

Northern Westchester Hospital proudly brought Gamma Knife technology to the Hudson Valley in 2005, and is currently the only Gamma Knife Center between New York City and Syracuse. In 2013, Northern Westchester Hospital invested in the latest and most advanced Gamma Knife model available, the Gamma Knife Perfexion, to provide an even wider array of patients in our region with the benefits of this non-invasive treatment. To date, our expert Gamma Knife team has treated more than 700 patients with Gamma Knife.

## GAMMA KNIFE PERFEXION: **HOW IT WORKS**

Combining the latest in diagnostic imaging techniques and state-of-the-art 3D treatment planning software, the Gamma Knife Perfexion uses up to 192 radiation beams to treat designed targets, while sparing surrounding healthy tissue from treatment. Individually, the radiation beams are weak and pass through healthy tissue with minimal effect. The radiation treatment dose is delivered at the specific, designated spot where the different beams converge.

# AM I A CANDIDATE FOR GAMMA KNIFE?

The Gamma Knife Perfexion has proven effective for patients with a variety of different conditions including:

- Metastatic brain tumors from a variety of primary cancers such as breast, lung, colon, kidney, and skin cancer
- Benign brain tumors such as meningiomas, acoustic neuromas, or pituitary adenomas
- Malignant primary brain tumors such as high grade glial or glomus tumors
- Vascular malformations in the brain such as arteriovenous malformations (AVMs) or cavernous malformations
- Functional diseases of the brain such as trigeminal neuralgia facial pain (tic douloureux)

Gamma Knife treatment may also be recommended if a patient:

- Has a condition that is surgically inaccessible or if surgery was deemed inadvisable
- Has other health risk factors (co-morbidities) that may make surgery and general anesthesia inadvisable
- Is still in need of additional treatment (after other treatment methods)
- Needs treatment for reoccurring or regrowth of disease or for residual disease
- Does not wish to undergo a surgical procedure

## Advantages and Benefits of Treatment with the Gamma Knife Perfexion

Treatment with the Gamma Knife Perfexion provides a multitude of benefits for patients:

- A painless treatment technique designed specifically to treat the brain and its surrounding structures, NOT other areas of the body
- A single (one day), outpatient treatment session; no need for multiple days or weeks of treatment
- A rapid return to pretreatment activities or lifestyle, typically in 24-72 hours, requiring no or very little rehabilitative services
- A treatment covered by most health and medical insurance companies, including Medicare
- No general anesthesia or incisions, eliminating the risks inherent to both
- An FDA approved and evidence-based therapy with more than 40 years of research and use
- A highly accurate treatment with a guaranteed accuracy of better than 0.5 mm
- Can treat multiple areas with efficiency and ease in one session
- A specially trained, expert multidisciplinary treatment team involved throughout the treatment process

## HOW CAN I BE EVALUATED FOR GAMMA KNIFE TREATMENT?

Most patients who come to Northern Westchester Hospital for Gamma Knife treatment, have a diagnosed intracranial or head and neck condition. The majority of patients are usually referred to one of our Gamma Knife treatment team members or to the Gamma Knife Center itself for evaluation, but we also welcome self-referrals for evaluation by our team. At Northern Westchester Hospital, Gamma Knife treatment is performed by a multidisciplinary team of specialists including a neurosurgeon, radiation oncologist, physicist, and specially trained nursing staff. We review each potential patient at our Gamma Knife Case Conference to ensure the patient is an appropriate case for Gamma Knife treatment. If you would like your case to be reviewed by our team, please call the Gamma Knife Center at (914) 242-8113.

## PREPARING FOR YOUR TREATMENT DAY

After your case is reviewed and deemed appropriate for Gamma Knife treatment, you will be scheduled for a treatment day. Our Gamma Knife Center staff will work with you to get the procedure scheduled as well as any necessary paperwork.

### **Once scheduled, here are some preparations you will need to make the night before your Gamma Knife procedure:**

- ▶ Make sure you discuss all medications you are taking with you Gamma Knife physician prior to treatment day
- ▶ Make sure to wash your hair, but avoid using any heavy products in your hair such as styling cream, spray or wax
- ▶ Avoid eating or drinking anything but water after midnight as this helps reduce risk of stomach upset during the procedure

# ON TREATMENT DAY

On the day of your Gamma Knife treatment, you will need to arrive at your scheduled time to the Gamma Knife Center, which is located inside the Northern Westchester Cancer Treatment Center building. Please remember to:

- ▶ Wear loose, comfortable clothing
- ▶ Avoid wearing any make up or cosmetics as well as any hair products or accessories
- ▶ Avoid wearing any jewelry

Once you check in with our staff and any additional paperwork and/or questions you may have are answered, you will be taken back to begin the Gamma Knife treatment process. Depending on your comfort level, you may receive oral and/or intravenous (IV) sedatives to help you relax during the procedure.

## THE GAMMA KNIFE TREATMENT PROCESS CONSISTS OF FOUR MAIN STEPS:

- 1** **Frame Placement:** As part of the procedure a temporary, lightweight stereotactic head frame is attached to your head with four small pins. Prior to placement, local anesthesia will also be used to numb the area. You will not feel the frame placement or pins. The frame is used to keep your head from moving during the procedure, and ensure the highest level of accuracy available on the market today. The pin points themselves are very small, about the size of a ballpoint pen tip. The frame itself weighs less than two pounds.
- 2** **Imaging:** The next step in a Gamma Knife procedure is to obtain precise images while you are wearing the head frame. Typically the imaging study will be an MRI or CT scan. In the case of vascular disease, an angiography may also be performed. The frame provides an exact reference point for the location of your disease which allows for extreme accuracy during treatment delivery.

- 3** Treatment Planning: While you rest or visit with family or friends, our expert, multidisciplinary team will begin planning your customized treatment plan. Depending on the complexity of your disease, this could take up to an hour or more.
  
- 4** Treatment: Once the treatment plan is complete, you will be moved into the Gamma Knife suite and will recline on the treatment couch. Team members will position your head and perform any necessary safety checks. Once those are complete, the team members will leave the room, and you will be moved head first into the machine for the treatment to begin. You will not see, hear, or feel the radiation treatment as it takes place. You will be in constant contact with your treatment team through two-way microphone and closed-circuit television. You may also listen to music of your choice through our system. Treatment times vary depending on the complexity of disease. Once treatment is complete, you will be moved out of the machine and the head frame will be removed. Temporary bandage dressing will be applied to the pin sites. You will be observed for a period of time, given follow up instructions, and released to go home in the care of family or friends.

## AFTER YOUR TREATMENT WITH GAMMA KNIFE PERFEXION



Most patients return to their pretreatment activities in roughly 24-72 hours. The only restrictions you will have will be the same as those prior to treatment.

The effects of Gamma Knife treatment occur over time, several weeks to years depending on the condition treated. The treatment goal with the Gamma Knife Perfexion is control. For tumors, the radiation delivered by the Gamma Knife unit alters the DNA of tumor cells so that they can no longer reproduce, eventually rendering the lesion

static. For vascular disease, the goal of treatment is total obliteration of blood flow through the abnormal blood vessels. The abnormal blood vessels treated with the radiation swell and eventually cut off blood flow through them. For trigeminal neuralgia, the goal for treatment is reduction of or freedom from pain and medications.

# POTENTIAL SIDE EFFECTS OF TREATMENT

With over 40 years of clinical use and results, the Gamma Knife has proven to be effective for a variety of brain diseases and conditions. While individual results may vary, here are some of the results for a few of the indications treated with Gamma Knife:

## BRAIN TUMORS

**Metastatic Brain Tumors** (Cancer spread to the brain from elsewhere in the body): Over 252,400 cases of single and multiple brain metastases have been treated by the Gamma Knife worldwide. Clinical research has shown local control provided by Gamma Knife treatment of brain metastases in any brain location generally exceeds 85%.

**Acoustic Neuromas** Over 63,000 acoustic neuromas have been treated worldwide with Gamma Knife, and clinical evidence reports long-term tumor control rates of 93-100% for tumors 3cm or less. Gamma Knife is typically carries a high hearing preservation rate of 60-90% for most patients. Research also supports that Gamma Knife treatment of these tumors helps preserve facial/trigeminal nerve function in more than 95% of patients.

**Meningiomas** Over 90,000 cases worldwide have been treated with Gamma Knife. Typically reserved for tumors less than 4 cm and those not causing a multitude of symptoms, Gamma Knife provides about 93-98% of patients long-term tumor control. For tumors less than 3.5 cm, clinical data supports that treatment results with Gamma Knife is equivalent to that of surgical resection of Simpson Grade 1 tumors, and that Gamma Knife treatment provides superior control rates for Simpson Grade 2 and Grade 3-4 resections. Gamma knife treatment can also be used to treat residual tumor, the tumor resection area, or for tumor reoccurrence or regrowth after surgery.

**Pituitary Adenomas** Over 50,000 cases have been treated with Gamma Knife worldwide. Clinical research supports tumor control rates with Gamma Knife treatment for both secreting and non-secreting tumors to be between 90-100%. For secreting tumors, research reports about 50-60% of patients will achieve hormonal control/balance 12-60 months after treatment.

## VASCULAR DISEASE

**Arteriovenous Malformations (AVMs)** Over 71,600 AVMs have been treated with Gamma Knife worldwide. Obliteration of blood flow typically occurs in 70-90% of patients over a period of one to six years.

## FUNCTIONAL DISEASE

**Trigeminal Neuralgia** Over 43,400 cases of trigeminal neuralgia have been treated with Gamma Knife worldwide. Clinical evidence supports 78-94% pain relief within three months post treatment. Most patients are able to begin tapering or decreasing medications. Long-term pain relief varies from 32-81% as reported by various treatment centers. Level 2 clinical evidence supports Gamma Knife to have the lowest rate of morbidity or associated sensory nerve dysfunction when compared to other treatments techniques.

THANK YOU