

An Introduction to Non-Invasive Neurosurgery:
***A Physician's Guide
to the Gamma Knife***



CJW Medical Center
Neuroscience & Gamma Knife Center
at Johnston-Willis

Part of caring for patients includes investing in the newest technologies, and bringing the benefits of medical research to the community. The Neuroscience and Gamma Knife Center at CJW Medical Center is now one of only two hospitals in Virginia to offer Gamma Knife® technology.

The Gamma Knife is the most advanced neurosurgical tool available for treating brain disorders. It's brain surgery without the incision – which means less pain, shorter recovery times and fewer complications.

There are many types of brain lesions for which traditional treatment is high-risk, because of the depth of the lesion or the location of nearby arteries, nerves and other vital structures. The Gamma Knife offers a safe and effective treatment for more than 30,000 patients every year.



Choosing the Gamma Knife

The Gamma Knife delivers 201 cobalt-60 ionized radiation beams to a single focal point, and enables physicians to better target damaged tissue, without damaging the surrounding healthy tissue. It is especially useful for patients who are not candidates for standard surgical techniques because of illness or age. It can be used to treat a range of brain disorders, including:

- Brain tumors (metastatic, pituitary or acoustic)
- Intracranial tumors
- Trigeminal neuralgia
- Chronic pain
- Epilepsy
- Parkinson's disease
- Vascular malformations

Since there are no incisions, patients have almost no pain or side effects. The Gamma Knife can be more cost-effective than traditional surgery because hospital stays are shorter and there are fewer complications.

Advantages of the Gamma Knife:

- With no incision, the risks of infection, hemorrhage and adverse reactions to anesthesia are minimal. Most patients receive only local anesthesia and a mild sedative.
- Surrounding tissue is spared from unnecessary radiation.
- Gamma Knife surgery is often more cost-effective because recovery time is reduced. Many patients leave the hospital on the same day as the treatment. Medicare and most insurance companies cover this treatment.
- Patients experience little, if any, discomfort during and after this minimally invasive procedure.

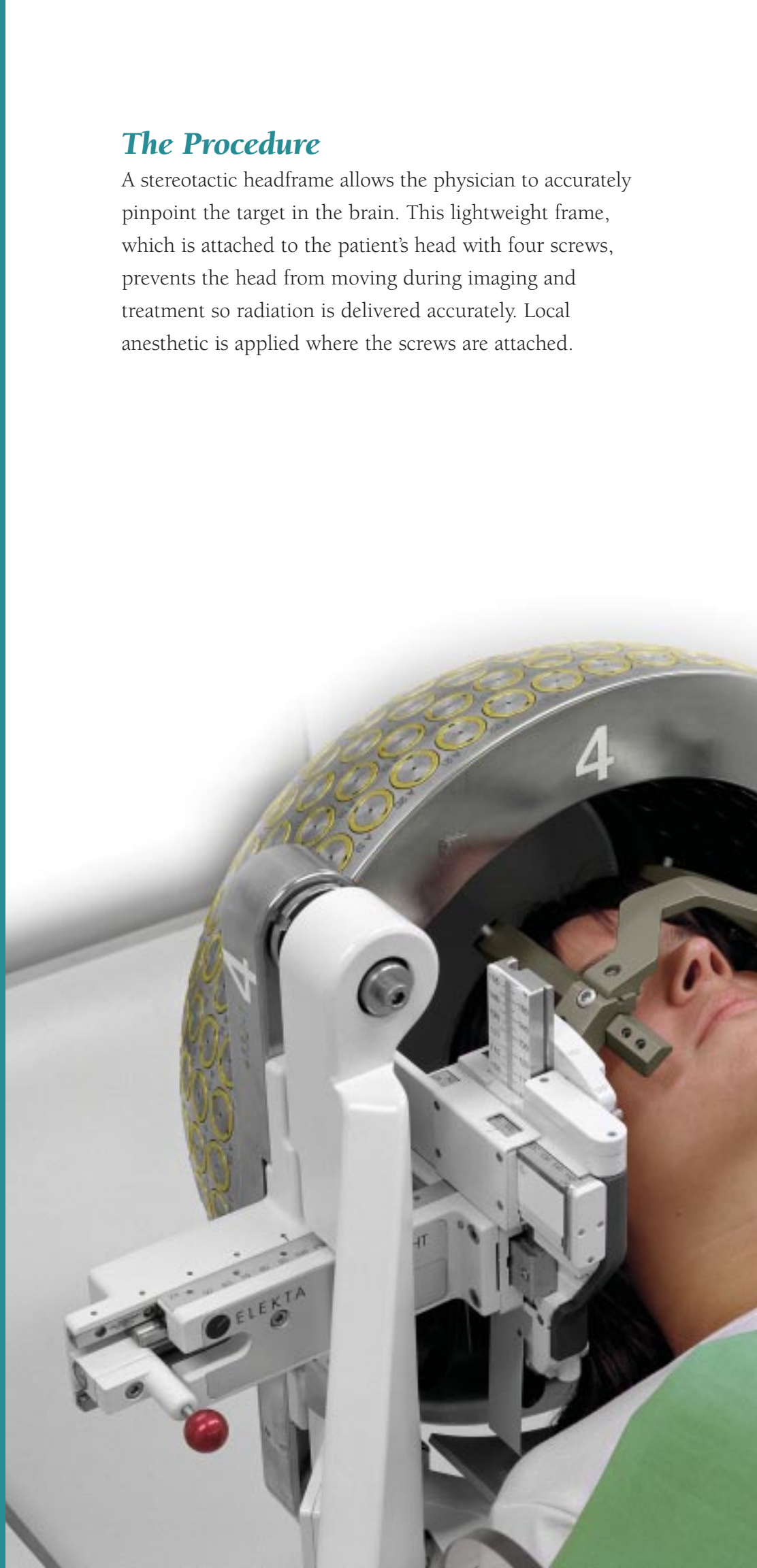


When to Use the Gamma Knife:

- For patients who are high-risk for standard surgery because of age, illness, tumor location or tumor size.
- To treat brain tumors, trigeminal neuralgias, acoustic neuromas, or vascular malformations.
- Under some circumstances, to treat chronic pain, epilepsy or Parkinson's disease.
- As a primary treatment, as an adjunct to surgical resection and radiation therapy, or to treat a recurrent tumor.

The Procedure

A stereotactic headframe allows the physician to accurately pinpoint the target in the brain. This lightweight frame, which is attached to the patient's head with four screws, prevents the head from moving during imaging and treatment so radiation is delivered accurately. Local anesthetic is applied where the screws are attached.



Before treatment, patients undergo imaging to determine the exact size, shape and position of the target in the brain. The treatment takes 15-60 minutes and is normally performed with local anesthesia.

When treatment is complete, the headframe is removed. Some patients experience a mild headache or minor swelling, but most report no problems. Most patients are discharged within 24 hours and return to their normal routines in a day or so.

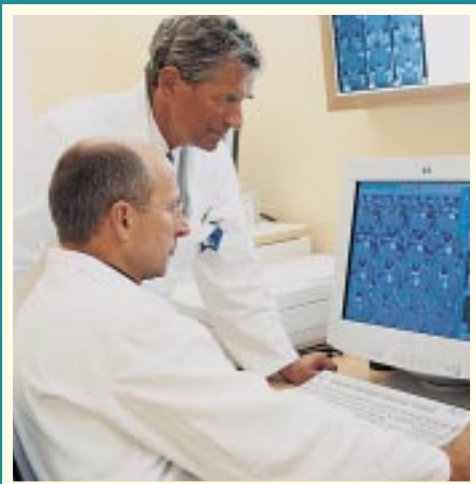
The Steps of the Procedure:

- A headframe is attached to the patient
- Patient undergoes imaging to determine the size and shape of the tumor
- Using specialized software and computer models, the physicians develop a treatment plan
- Treatment with the Gamma Knife takes 15 minutes to an hour
- Most patients are discharged within 24 hours



The Neuroscience and Gamma Knife Center at CJW Offers:

- Radiotherapy and radiosurgery using the LINAC XKnife for larger tumors
- Conventional surgery in two dedicated neurosurgical operating suites with stereotactic navigational capabilities
- One of the only neuro-interventional radiologists in the Richmond area
- A six-bed neuroscience intensive care unit
- A 15-bed neuroscience unit
- Specially trained neuroscience nurses in all neuroscience areas
- Diagnostic technology, such as MRI/MRA, spiral CT, PET scanning, SPECT, EEG, EMG, EP



The Neuroscience and Gamma Knife Center at Johnston-Willis

The Gamma Knife is the newest addition to CJW, which has a long history of clinical excellence. No other community hospital in Central Virginia can match the range of neuroscience services provided at CJW. Our medical staff includes highly trained neurologists, neurosurgeons and neuroscience nurses. CJW also employs one of the only neurointerventional radiologists in the area to perform embolizations, GDC coils or other diagnostic services.



CJW has two dedicated neurosurgical operating suites and a special six-bed neuro intensive care unit. The operating suites are equipped with the latest navigational systems and surgical tools, such as the ultrasonic aspirator, state-of-the-art microscopes and hands-free technology. In addition, special suites are available on the neuroscience stepdown floor so a patient's out-of-town family members can be comfortable.

CJW has a wide range of neuro diagnostic services, including PET scanning, MRI/MRA, CT, EEG, EMG, carotid ultrasound, echocardiogram and digital angiography. Doctors also have access to planning technology like the new IMRT, and treatment options like the LINAC XKnife, radiosurgery and radiotherapy.

For More Information:

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