

Gamma Knife Radiosurgery

Minimally invasive treatment for brain tumors, metastases and select brain disorders



Gamma Knife radiosurgery is now a first-line therapy for **multiple brain tumors** and new standard of care for **multiple brain metastases**.

Gamma Knife is a safer, **cognition-sparing treatment** that improves medical outcomes and quality of life.

What Sets Us Apart

- **Latest technology.** Roswell Park's Leksell Gamma Knife® Icon™ is the sixth generation and most precise radiosurgery tool available — and the first one installed for use in an American cancer center.
- **Exclusive provider in WNY.** We are the only center in the region to offer cranial radiosurgery with Gamma Knife.
- **High-volume experience** from treating more than 6,000 patients — Roswell Park now treats more than 500 annually — with Gamma Knife.
- **Option for frameless fixation**, which makes it feasible to provide this treatment in multiple fractions, increasing safety and improving quality of life.
- **Ability to treat large numbers of metastases** by fractioning treatment over several days, minimizing amount of brain irradiated, and reducing long-term side effects.

Conditions we treat with Gamma Knife

- **Metastatic brain tumors and lesions** arising from primary tumors of the breast, kidney, colon, uterus, skin (melanoma) or other organs
- **Brain tumors, malignant and benign, <3.5 cm. in diameter, including:**
 - Meningiomas
 - Gliomas (glioblastoma, astrocytoma, oligodendroglioma)
 - Craniopharyngiomas
 - Hemangioblastomas
- **Pituitary adenoma**
- **Trigeminal neuralgia/tic douloureux**
- **Arteriovenous malformation**
- **Acoustic neuroma (vestibular schwannoma)**
- **Essential tremor and other movement disorders**



How it works

Gamma Knife radiosurgery targets tumors with 192 intersecting gamma ray beams, providing a sharp, micro-precision “cutting” edge while sparing healthy brain tissue, achieving effective tumor control and stable imaging.

Using Gamma Knife radiosurgery in lieu of whole brain radiotherapy reduces the time a patient spends in our department from 3 weeks to 3 hours on a single day.



“The new standard of care for multiple brain metastases, Gamma Knife radiosurgery preserves patients’ normal brain function, cognition and quality of life, while undergoing treatment with the latest immunotherapy — collectively improving cancer outcomes.”

—Dheerendra Prasad, MD, MCh, FACRO

About the Leksell Gamma Knife® Icon™

This next-generation technology is the most advanced and precise radiosurgery tool available.

FEATURES:

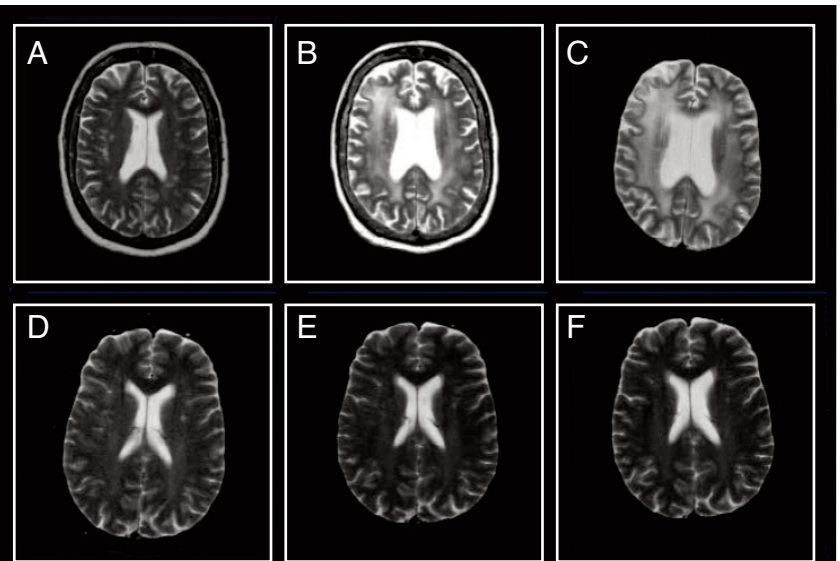
- Provides accuracy to within .15 mm.
- Integrated, on-board cone beam CT provides real-time dose confirmation.
- High-definition infrared tracking to correct for patient movement.
- Capable of treating tumors close to critical structures such as the optic nerve.
- Meets the needs of many more patients with brain tumors.

Benefits of Gamma Knife radiosurgery

- No general anesthesia required. Virtually eliminates risks associated with conventional neurosurgery, such as bleeding and infection.
- Ability to treat deep-seated tumors not accessible with conventional neurosurgery.
- May be used in conjunction with traditional neurosurgery for tumors that cannot be completely excised, to enhance the long-term outcomes of patients.
- Repeat treatment can be given for patients with metastatic tumors who subsequently develop additional tumors.
- Minimal side effects.
- Generally does not delay or interrupt systemic treatment.
- Outpatient procedure. Patients usually return to normal activities within 24 hours.
- Significantly reduced mortality from metastatic disease.

“In Gamma Knife radiosurgery, less than 0.5% of the brain receives radiation, compared to 20-30% with LINAC or Cyber Knife-based treatment or 100% with whole brain radiotherapy. That’s a huge savings in terms of neurocognition, and holds the promise of a much better quality of life.”

—Dheerendra Prasad, MD, MCh, FACRO



A comparison of Gamma Knife vs. whole brain radiation therapy (WBRT)

These T2 weighted images of the brain show the difference between a patient who received whole-brain radiotherapy and one who received Gamma Knife over time. Images A and D depict initial presentation. Images at one year (B) and two years (C) after whole-brain radiotherapy are dramatically different than those taken one year (E) and two years (F) after three Gamma Knife treatments. The lighter appearance of the brain in B and C indicates degeneration of white matter connections – which manifest in impaired cognitive function. These changes are clearly missing in E and F despite multiple Gamma Knife treatments.

Meet the Team

Our Gamma Knife team includes full-time radiation oncologists, medical physicists, neurosurgeons and nurses who work together to plan and deliver these highly complex treatments to our patients.

Dr. Prasad has treated more than 12,000 patients with Gamma Knife, and serves as an onsite advisor and mentor to more than 60 institutions around the world as they begin to use Gamma Knife radiosurgery.



Dheerendra Prasad, MD, MCh, FACRO
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Robert Fenstermaker, MD
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Robert Plunkett, MD
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Andrew J. Fabiano, MD
Assistant Professor of Neurosurgery and Oncology

Roswell Park's Gamma Knife Radiosurgery program is the only one in New York State set up as a community resource. We train and credential community neurosurgeons and radiation oncologists so they may treat their patients here with the benefit of Roswell Park's physicists, radiologists and radiation oncologists to ensure treatment planning and delivery meet Roswell Park's high quality standards.

Refer a Patient

Call us today to discuss a case, confirm a diagnosis or refer a patient. Phone: **716-845-RPMD (716-845-7763)**. For rapid physician-to-physician contact, 716-845-3173 (and press 1).



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