

GAMMA KNIFE® SURGERY



LEKSELL GAMMA KNIFE

Gamma Knife® surgery

Facts and figures



What is Gamma Knife® surgery?

Leksell Gamma Knife® is not actually a knife at all. It is a very precise and effective instrument that uses radiation to treat the brain.

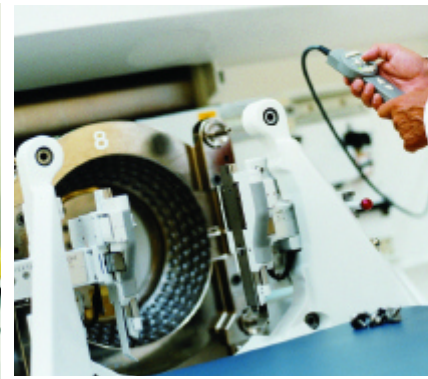
Since Leksell Gamma Knife® uses radiation, this treatment is often called radiosurgery. Using this method, doctors are able to focus radiation directly, and very precisely, on the target in the brain without affecting surrounding healthy tissue.

Each radiation beam is individually too weak to damage the normal tissues it crosses on the way to the target, but when focused precisely on that target, where it intersects, the combined radiation is sufficient to treat the targeted area. The radiation source used is called cobalt 60.

Alternative to open surgery

Gamma Knife® surgery is an alternative or can be complementary to open surgery. The procedure is normally performed by a neurosurgeon accompanied by a radiation oncologist and medical physicist.

Gamma Knife® surgery provides lower complication rates than open surgery. Both mortality and morbidity rates are lower for radiosurgery.⁽¹⁾



Gentle treatment

Since no incision is made, the risk of surgical complications is low. The patient's head does not have to be shaved and side effects are few. Treatment is much shorter than conventional surgery and causes only minor discomfort. Also, the patient can leave the day of surgery or stay overnight for observation, compared with several weeks for traditional surgery.

The treatment is complete in one session and seldom takes more than an hour or two. The full effects of Gamma Knife® surgery may not be seen for several months following treatment.

Standard of care

Gamma Knife® surgery is a standard of care for its indications. In the last five years, the number of patients treated per year has increased by 300%. More than 30,000 patients every year worldwide are treated with Gamma

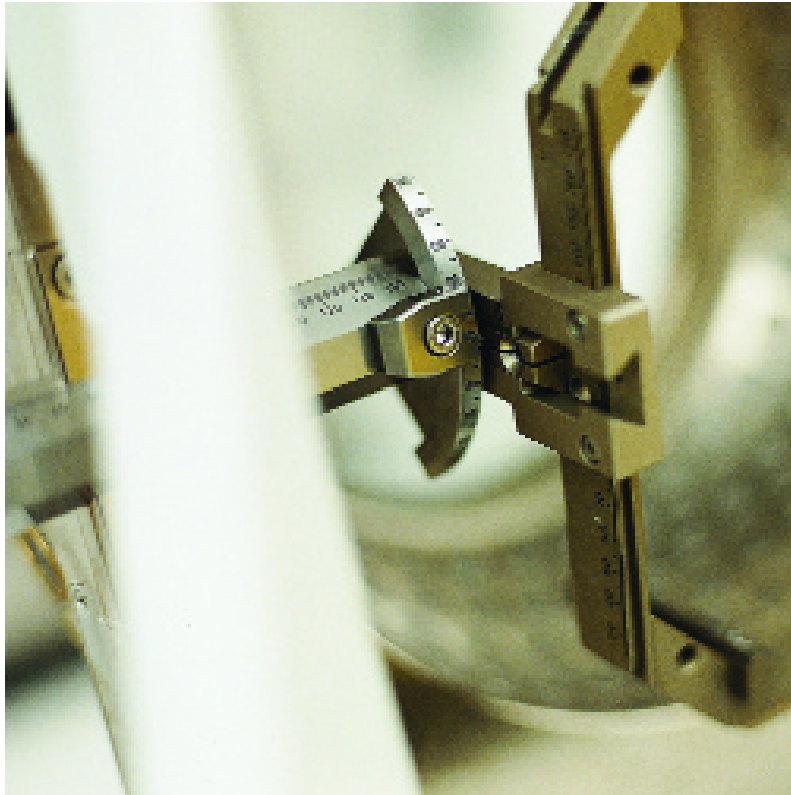
Knife® surgery. Still, there is undertreatment in many countries, less than 20% of the patients who could benefit from Gamma Knife® surgery currently have access to this form of treatment.

Healthcare saving costs

Gamma Knife® surgery is highly cost effective. Treatment using Leksell Gamma Knife® is far less expensive for healthcare institutions and the patient, than traditional surgery. In most cases the convalescence period is extremely short while the corresponding period following surgery may extend several months. The cost for radiosurgery is normally half the cost for open surgery. Most important, Gamma Knife® surgery offers a more favorable quality of life before, during and after the procedure.

1) Dheerendra Prasad, University of Virginia, USA Gamma Knife Surgery and Microsurgery, Clinical Review, 2002

Questions and answers



Leksell Stereotactic System®:
Leksell® Coordinate Frame with
MR indicator, used for target localization

1. What is Stereotactic Radiosurgery (SRS)?

Stereotactic Radiosurgery treats brain disorders by delivering a single high dose of radiation in a one-day session. Treatment involves the use of focused radiation beams delivered to a specific area of the brain to treat abnormalities, tumors or other functional disorders.

2. When was the first Leksell Gamma Knife® installed?

Leksell Gamma Knife® is a Swedish invention. In 1968 the first Leksell Gamma Knife® was installed at the private hospital Sophiahemmet in Stockholm, Sweden. The first in the U.S. was installed in 1987 in Pittsburgh.

3. Why is it called surgery?

Radiosurgery (one-session treatment) has such a dramatic and precise effect in the target zone that the changes are considered 'surgical'. Through the use of three-dimensional computer-aided planning and the high degree of immobilization of the patient, the treatment can minimize the amount of radiation to surrounding healthy brain tissue. Gamma Knife® precision is submillimeter.

Stereotactic radiosurgery is routinely used for brain tumors and lesions. It may be the primary treatment; utilized where a tumor is inaccessible by surgical means; or as a boost or adjunct to other treatments with a recurring or malignant tumor.

4. How does it work?

Stereotactic radiosurgery works the same as all other forms of radiation treatment. It does not remove the tumor or lesion, but it distorts the DNA of the tumor cells. The cells then lose their ability to reproduce

Leksell Gamma Knife® is used for treating targets in the brain such as:

benign and malignant brain tumors

blood vessel abnormalities in the brain (AVMs)

functional disorders e.g. epilepsy, Parkinson's disease, facial nerve pain

and retain fluids. The tumor reduction occurs at the rate of the normal growth rate of the specific tumor cell. In lesions such as AVMs (a tangle of blood vessels in the brain), radiosurgery causes the blood vessels to thicken and close off. The shrinking of a tumor or closing off of a vessel occurs over a period of time. For benign tumors and vessels, this will usually be 18 months to two years. For malignant and metastatic tumors, results may be seen as soon as a couple of months as these cells are very fast-growing.

5. How many Gamma Knife® units are installed worldwide?

Europe	31
North America	98
Latin America	2
Middle East	4
Asia	38
Japan	49
TOTAL	222

6. What is the price for Gamma Knife® installation?

The initial investment for the equipment is approximately \$3.87M USD. Clinics also have to have access to imaging equipment, eg. MR, CT scan and angiography, which most modern neurosurgery departments have today.

7. Are there any side effects after Gamma Knife® surgery?

Patients may experience side effects, but they are often very mild. Headache, dizziness, seizures or nausea may be experienced immediately after the treatment, but the effects will disappear soon after the procedure.

8. What about the radiation risk?

The dose of radiation is extremely focused to the target in the brain and the dose outside the target is very low.

Evidence-based medicine

Since 1968 more than 300,000

patients have been treated and over

2,000 scientific papers have been

published relating to the use and

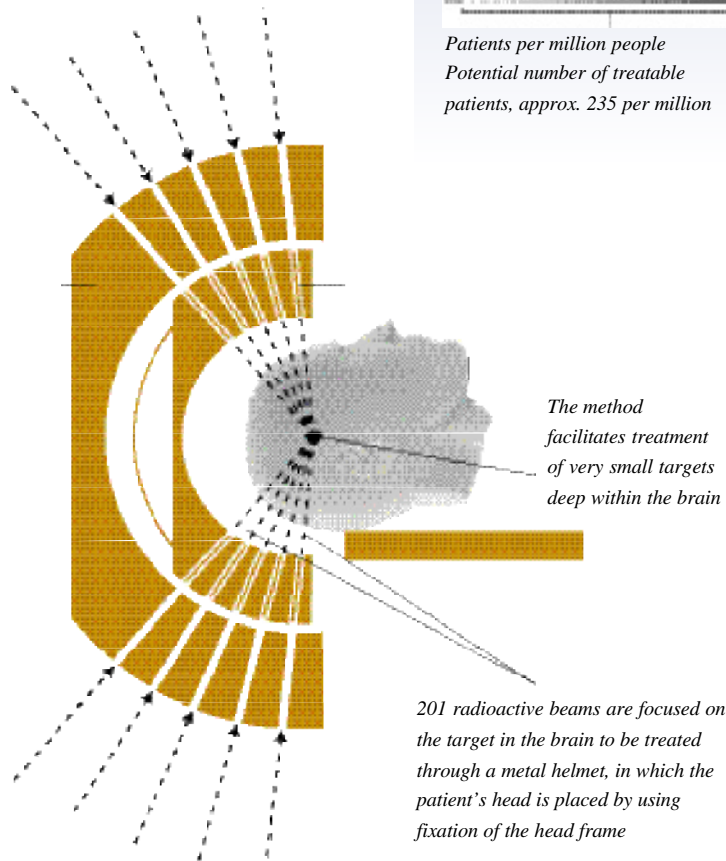
success of Gamma Knife® surgery.



Gamma Knife® surgery is a non-invasive treatment method. The patient can normally return home the same day as or the day after treatment.

Treatment method

Gamma Knife[®] surgery is a non-invasive surgery for neurological diseases. The surgery does not require the skull to be opened for performance of the operation. The patient is treated in one session and can normally return home shortly after treatment.



9. Is Gamma Knife[®] surgery a reimbursed treatment?
Yes.

10. Who determines if radiosurgery is appropriate?

Medical necessity can be determined by a neurosurgeon, radiation oncologist or other medical specialist after evaluating a prospective patient's medical condition. Treatment options are then determined and discussed with the patient and family, so an informed decision may be made.

11. What other products are sold by Elekta?

Besides Leksell Gamma Knife[®] and stereotactic instruments for neurosurgery, Elekta also supplies radiotherapy equipment for cancer, such as precise digital linear accelerators for treating cancer in the whole body.

For more information on Gamma Knife surgery or other Elekta innovative products, please contact us at info.america@elekta.com or 800-535-7355.

Gamma Knife® surgery

Fighting serious disease

www.elekta.com

Stereotactic Neurosurgery • Gamma Knife® surgery • Functional Mapping • Precision Radiation Therapy • Image Guided Radiation Therapy • Stereotactic Radiation Therapy

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