
First Patient in U.S. Gets Gamma Knife Icon Radiosurgery



Swedish Elekta's Leksell Gamma Knife Icon stereotactic radiosurgery (SRS) system was used for the first time in the U.S. on 1 March at Sutter Medical Center, Sacramento Gamma Knife Center to treat a metastatic brain tumour.

The patient, a 52-year-old male from El Dorado Hills, Calif., had previously undergone successful treatment for primary melanoma and for melanoma metastases to his lung.

The patient's treatment was planned and guided using a frameless approach, one of Icon's new features integrated with a high definition motion management that provides accuracy similar to that of frame-based SRS systems while minimising dose to normal tissue.

"Increasing the precision of frameless cranial SRS is essential for effectively targeting tumour tissue while protecting healthy brain tissue from damage," said Samuel Ciricillo, MD, Medical Director of Adult and Pediatric Neurosurgery at Sutter Neuroscience Institute.

"There is a two- to four-fold improvement in sparing normal brain tissue compared to other linear accelerator platforms allowing for greater potential to protect patient quality of life both during treatment and after recovery."

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[Elekta's](#) Gamma Knife radiosurgery system helps improve the efficacy of cranial SRS with fewer side effects. Icon also provides the flexibility for single dose administration or multiple treatment sessions over time, which enables treatment of larger tumour volumes, targets close to critical brain structures and new or recurring brain metastases.

At the time of SRS, pre-treatment MRI images and cone-beam computed tomography (CBCT) images are aligned to identify precise coordinates for radiation targeting within the brain. This technology is important for patients who undergo multiple treatment sessions.

Dr. Ciricillo worked with Sutter Medical Center radiation oncologist Harvey Wolkov, MD, and physicist Stanley Skubic, PhD, on the procedure. They are founding members of the team that started the Sutter Gamma Knife programme in 1998.

Gamma Knife is an increasingly used treatment option for patients with primary or metastatic brain tumours and other neurologic disorders such as severe facial pain (trigeminal neuralgia) and vascular malformations.

In the U.S., Gamma Knife is the most commonly used radiosurgery platform for the brain[1], it is the most clinically proven technology for cranial indications[2] and offers the lowest dose to normal tissues.[3],[4],[5],[6],[7]

The advances contributing to Gamma Knife [Icon](#) are the result of Elekta's 30-year history in SRS technology and decades of collaboration with surgeons and radiation oncologists around the world.

Meanwhile, St. Petersburg's Diagnostic and Treatment Center at the International Institute of Biological Systems announced in February plans to upgrade its system to the latest generation Leksell Gamma Knife Icon.

Treating three to five patients per day throughout a seven-day work week, it is among the most prolific Gamma Knife centres in Eurasia. In 2015, the center treated a record 1,235 patients suffering from brain tumours and other intracranial disorders - 158 in December alone - with the Leksell Gamma Knife Perfexion radiosurgery system it installed in late 2014. The clinic, which began treating with an earlier Gamma Knife model in 2009, has broken its "patients treated" record every year since then.

"We could easily treat 2,000 patient each year with Perfexion if there were higher federal subsidies for Gamma Knife radiosurgery. Since patients pay out-of-pocket, with possibly some help from their municipal government, demand is still limited," explained Arkadi Stolpner, MD, President of the Diagnostic and Treatment Center.

"According to a *Lancet* study, cancer is the second most common cause of death in Russia, contributing to 15 percent of annual national mortality," said Francois Pointurier, Senior Vice President, Region Europe & AFLAME, Elekta.

Patients with one or more metastases (mets) represent about a third of the St. Petersburg centre's case volume.

Dr. Stolpner said he plans to upgrade the centre's Perfexion system to Leksell Gamma Knife Icon as soon as Icon has approval in Russia.

"We have a great deal of experience in hypofractionation* with the two linac-based radiosurgery systems we also operate here," Dr. Stolpner added. "Having the ability to perform both single session and multi-session hypofractionated cranial radiosurgery with Icon adds another option for patients. The physician can select the best option for a particular indication, accounting for target location, patient condition and other factors."

*A treatment regime in which the total radiation dose is divided into large doses and treatments are delivered once per day or less frequently.

References:

1. CMS data to 2013
2. Pubmed to June 2015
3. Ma L, Petti P, Wang B, et al. (2011) Apparatus dependence of normal brain tissue dose in stereotactic radiosurgery for multiple brain metastases. *J Neurosurg* 114(6):1580-1584. doi:10.3171/2011.1.JNS101056.
4. Ma L, Nichol A, Hossain S, et al. (2014) Variable dose interplay effects across radiosurgical apparatus in treating multiple brain metastases. *Int J CARS*. Published online: 20 April 2014. doi:10.1007/s11548-014-1001-4
5. Descovich M, Sneed PK, Barbaro NM, et al. (2010) A dosimetric comparison between Gamma Knife and CyberKnife treatment plans for trigeminal neuralgia. *J Neurosurg* 113:199-206.
6. McDonald D, Schuler J, Takacs I, et al. (2014) Comparison of radiation dose spillage from the Gamma Knife Perfexion with that from volumetric modulated arc radiosurgery during treatment of multiple brain metastases in a single fraction. *J Neurosurg (Suppl 2)* 121:51-59.
7. Lindquist C, Paddick I. (2007) The Leksell Gamma Knife Perfexion and comparisons with its predecessors. *Neurosurgery* 61:ONS-130-ONS-141, doi: 10.1227/01.NEU.0000279989.86544.B6.

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