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## Stereotactic Radiosurgery (SRS)

UCSF is recognized worldwide as a leading center of excellence for brain tumors, with tremendous expertise and close collaboration among neurosurgeons, neuro-oncologists, radiation oncologists, neuroradiologists, and neuropathologists.

Various forms of radiation are commonly involved in the treatment of brain tumors and selected other brain conditions. UCSF has a wide variety of available techniques and specialized equipment, so that the best treatment can be chosen for any individual case. One such technique is stereotactic radiosurgery (SRS), which involves the delivery of a high dose of radiation precisely focused on a target within the brain. SRS is a non-surgical procedure and does not involve an actual knife; it is called "radiosurgery" because of its precision.



**Gamma Knife team at UCSF:** Lijun Ma, PhD, Jean Nakamura, MD, Philip Theodosopoulos, MD, Lena Jew, RTT, Michael McDermott, MD, Patricia ?Penny? Sneed, MD, Steve Braunstein, MD, PhD, Lisa Mannheimer, RN, Shannon Fogh, MD, Olivier Morin, PhD, Brandon Weethee, MSc, Ted Hau

Radiosurgery is often used for:

- Small brain metastases
- Benign brain tumors such as meningiomas, schwannomas, and pituitary adenomas
- Arteriovenous malformations not amenable to safe removal via surgery
- Trigeminal neuralgia



Gamma Knife nurses Elana Feldman, RN and Gary Dickson, RN, and medical assistant Valerie Salazar-Burgo

The Gamma Knife <sup>[1]</sup>, developed by Swedish neurosurgeon Lars Leksell, is a highly-specialized machine used for radiosurgery, employing tightly focused gamma rays. Gamma Knife <sup>[1]</sup> is the gold standard for radiosurgery, with unparalleled capabilities and superior normal tissue protection compared with other techniques for brain radiosurgery. UCSF was one of the first centers in the United States to acquire a Gamma Knife, in 1991. We have had a very active program ever since then, upgrading to each new model of Gamma Knife; currently we have the Perfexion Gamma Knife. Over 4,400 patients have been treated with Gamma Knife <sup>[1]</sup> radiosurgery at UCSF, and we currently treat approximately 300 patients yearly. Selection of cases and review of follow-up imaging take place at a weekly multidisciplinary conference attended by neurosurgeons and radiation oncologists with expertise in radiosurgery and other forms of treatment, along with neuroradiologists, a Gamma Knife nurse and Gamma Knife coordinator.

Most Gamma Knife treatments are performed with a stereotactic frame (?halo?) in place, fixed to the head by a neurosurgeon under local anesthesia, to attain the ultimate accuracy and precision. Certain Gamma Knife treatments can be performed without the frame, using a

dental mold system called ?Extend.? The next Gamma Knife model - Icon - will greatly facilitate frameless treatment.



### Gamma Knife conference at UCSF

For frame-based treatments, all of the steps are performed in one day: frame placement by the neurosurgeon with the help of a nurse, as well as imaging, planning, and treatment. For non-frame-based treatments, steps may be spread out over more than one day, and up to five treatments may be given over the course of a week.

Gamma Knife FAQ [2].

<b>Stereotactic Radiosurgery Team</b>	*/
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Jean Nakamura, MD [5]	
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