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## CyberKnife



CyberKnife at UCSF

The CyberKnife<sup>®</sup> is one of the most advanced forms of radiosurgery. It is a painless, non-invasive treatment that delivers high doses of precisely targeted radiation to destroy tumors or lesions within the body. It uses a robotic arm to deliver highly focused beams of radiation. The flexibility of the robotic arm makes treatment possible to areas of the body, such as the spine and spinal cord, that can't be treated by other radiosurgery techniques.

The UCSF Radiation Oncology department is one of only a few centers in California that offer CyberKnife treatments to patients; our program began in 2003. In many cases, patients with tumors that today are treated with the CyberKnife were previously considered untreatable with surgery or conventional radiation therapy.

## Procedure



Alexander Gottschalk, MD, PhD <sup>[1]</sup>, Director of the CyberKnife Program

Radiosurgery minimizes radiation exposure to healthy tissue surrounding the tumor. Compared to other radiosurgical treatments, the CyberKnife offers several advantages to patients, including rapid relief from pain and other symptoms.

Treatments are performed on an outpatient basis, with each treatment lasting between 30 to 90 minutes. The number of treatments varies depending on the tumor size, location and shape but typically only one to five daily sessions are required. The CyberKnife allows patients to lie comfortably on the procedure table without anesthesia while the robotic arm moves, without touching them, to treat all areas of the tumor.

Recovery is often immediate, given the CyberKnife's low risk of complications and damage to healthy tissue.

Because stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT) use high doses of radiation to ablate all tissue within the irradiated volume, whether it is tumor or normal tissue, in only a few fractions, precise tumor tracking is required. The CyberKnife system is the only one that can deliver SRS <sup>[2]</sup> and SBRT <sup>[3]</sup> via our sophisticated technologies and tracking solutions, giving you confidence that doses are delivered with accuracy and that radiation exposure of surrounding healthy tissue and organs is minimized.

Some conditions may be treated with a different non-invasive radiotherapy device called the Gamma Knife <sup>[4]</sup>, which also delivers a single, finely focused, high dose of radiation. At UCSF Department of Radiation Oncology, the Gamma Knife is used primarily to treat small benign or malignant brain tumors, epilepsy, trigeminal neuralgia or abnormal blood vessel formations located in the brain.

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UCSF Main Site

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**Links**

[1] <https://radonc.ucsf.edu/alexander-gottschalk>

[2] <https://radonc.ucsf.edu/stereotactic-radiosurgery-srs>

[3] <https://radonc.ucsf.edu/stereotactic-body-radiation-therapy-sbrt>

[4] <https://radonc.ucsf.edu/gamma-knife>