Physician Information

CyberKnife®

Advanced Tumor Treatment

100 SOLUCIENT TOP HOSPITALS

SOUTHWEST WASHINGTON MEDICAL CENTER

Advanced medicine with a human touch.

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Advanced Tumor Treatment with CyberKnife®

The CyberKnife Robotic Radiosurgery System is the world's first and only radiosurgery technology designed to treat tumors anywhere in the body with sub-millimeter accuracy. Using image-guidance technology and computer-controlled robotics, the CyberKnife System is designed to continuously track, detect and correct for tumor and patient movement throughout the treatment. As a result, the CyberKnife does not require invasive head or body frames to stabilize patient movement, vastly increasing the system's flexibility.

More than 20,000 treated

The CyberKnife Robotic Radiosurgery System takes advantage of intelligent robotics to enable the effective treatment of tumors anywhere in the body. To date, more than 20,000 patients have been treated with the CyberKnife System and currently more than 50 percent of all CyberKnife procedures in the United States are extracranial.

Unlike traditional radiosurgery systems that can only treat tumors in the head and neck, the CyberKnife can treat both intracranial and extracranial tumors. In fact, extracranial treatments currently represent more than 50 percent of CyberKnife System procedures in the United States, including those of the spine, lung, prostate, liver and pancreas. The CyberKnife System provides an additional option to many patients diagnosed with previously inoperable or surgically complex tumors, and those patients who have previously been exposed to the maximum allowable dose of radiation.

Advantages of CyberKnife

For the patient:

- *Treats tumors anywhere in the body*
- *Delivers treatments with sub-millimeter accuracy, minimizing damage to surrounding healthy tissue*
- *Utilizes the skeletal structure of the body as a reference, eliminating the need for invasive frames typically used with traditional radiosurgery systems*
- *Offers an option for inoperable or surgically complex tumors*
- *Successfully treats patients in single or multiple fractions*
- *Allows soft-tissue fiducials to be placed as a minor outpatient procedure using local anesthetic*
- *Features a patient-centric design providing a relaxed treatment experience*

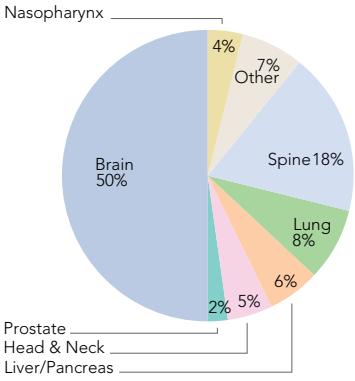
For the physician:

- *Continuously tracks, detects and corrects for tumor and patient movement throughout the treatment*
- *Provides unsurpassed linac maneuverability and complete access and coverage for any tumor volume*
- *Complements existing radiation therapy, IMRT or IGRT programs*
- *Enables superior flexibility in treatment planning:*
  - *Forward or inverse treatment planning*
  - *Isocentric or non-isocentric treatment plans*
  - *Simultaneous treatment of multiple tumors*

What CyberKnife® Treats

- ***Malignant brain tumors:*** *astrocytomas, gliomas, intracranial metastases, nasopharyngeal carcinomas*
- ***Benign brain tumors:*** *acoustic neuromas, benign intracranial, craniopharngiomas, hemanioblastomas, menigiomas, pituitary adenomas, schwannomas*
- ***Vascular malformations:*** *arteriovenous malformations (AVMs), cavernous malformations*
- ***Extracranial tumors and lesions:*** *base of skull, head and neck, spine/bone (cervical, lumbar, thoracic, sacrum, pelvis), liver, lung, pancreas and prostate*

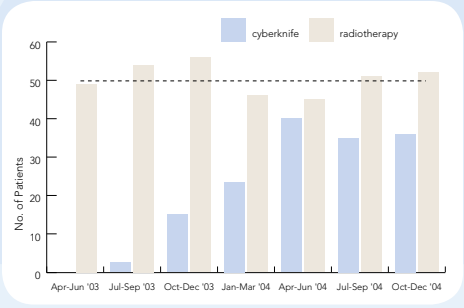
*Treatments by Tumor Location**



CyberKnife vs. Traditional Radiosurgery

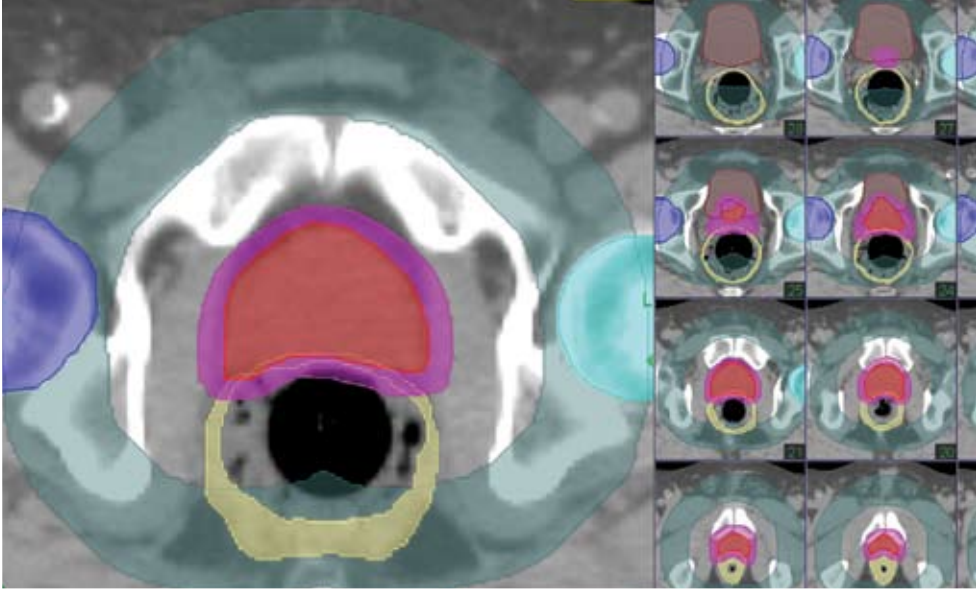
Traditional radiosurgery—or stereotactic radiosurgery—has been used to treat tumors in the head for more than 30 years. It utilizes high doses of radiation targeted at the site of the tumor and typically delivered in one treatment session. The treatment relies on a rigid metal frame that is fixed to a patient's skull, immobilizing the head so that damage to the healthy tissue surrounding the tumor is minimized when the radiation is delivered.

In contrast to traditional radiosurgery, The CyberKnife System combines image-guidance technology and computer-controlled robotics, which enable the system to deliver high doses of radiation without a metal head frame while maintaining sub-millimeter accuracy. Because of this accuracy, other areas of the body become treatable with robotic radiosurgery, such as the spine, lung, prostate, liver and pancreas. Additionally, because CyberKnife is non-invasive, treatments can be delivered in single or multiple fractions, at the patient's convenience.



CyberKnife vs. Radiotherapy

**Estimates only.*



Xsight™ Spine Tracking System

Southwest's CyberKnife® System includes the revolutionary Xsight Spine Tracking System, making it possible to treat tumors in or near spinal structures without implanting radiographic markers or fiducials. An important differentiating feature of the CyberKnife System, the Xsight System relies on the unique bone anatomy of the spine to continuously track, detect and correct for tumor and patient movement along the spinal column.

The Synchrony™ Respiratory Tracking System

Southwest's CyberKnife system also features Synchrony™, the first and only technology that allows patients to breathe normally throughout their treatment. It enables clinicians to track, detect and correct for tumor and patient movement throughout the treatment, minimizing damage to surrounding healthy tissue and critical structures.

Synchrony literally synchronizes the CyberKnife System's linear accelerator to the motion of the tumor, automatically adjusting and compensating for patient and tumor movements in real-time while delivering radiation. This advancement allows for significantly shorter treatment times compared to breath-holding and enables treatment of tumors throughout the body.

CyberKnife® Robotic Radiosurgery Components:

1. *Ceiling-mounted diagnostic X-ray sources*
2. *Compact linear accelerator mounted on multi-jointed manipulator*
3. *Automatic patient positioning system with 5 degrees of freedom (up/down, left/right, superior/inferior, pitch and roll)*
4. *Amorphous silicon image detectors mounted flush to the floor*

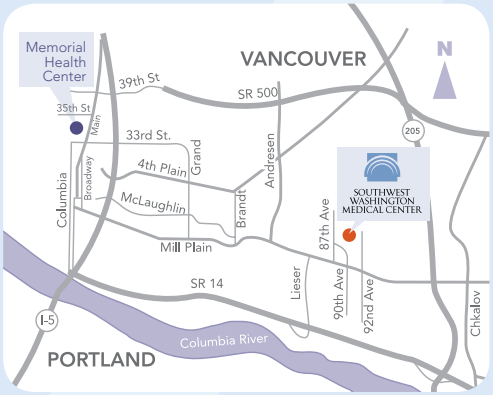
The CyberKnife System is the only radiosurgery system with a compact 6-MV X-band linear accelerator and a multi-jointed manipulator that enables unlimited beam positions — the greatest flexibility of approach available in any radiosurgery system, providing increased access to tumors anywhere in the body.

CyberKnife® Team (from left to right): S. Christopher Hoffelt, M.D.; Ashok Modha, M.D.; Robert Bloch, M.D.; Hoang Le, M.D.; Norman Rokosz, M.D. ***Not pictured:*** *John Holland, M.D.; Riyad Karmy-Jones, M.D.; Carol Marquez, M.D.*

The Southwest CyberKnife team

The Southwest CyberKnife team is led by radiation oncologist S. Christopher Hoffelt, M.D. In addition to his role in the Radiation Oncology department, part of Southwest's Cancer Center, Dr. Hoffelt is also on the faculty at Oregon Health and Science University (OHSU). Before joining Southwest's Cancer Center, Dr. Hoffelt was part of the team at Baltimore's Sinai Hospital that introduced the CyberKnife technology for tumor treatments.

CyberKnife®



Southwest Washington Medical Center
400 NE Mother Joseph Place
Vancouver, Washington, 98664

Campus Location:
The CyberKnife® Center is located within the Cancer Center building, located at the 87th Avenue entrance.

Find Out More About CyberKnife
The Southwest Washington Medical Center Web site offers more information about the CyberKnife System, including videos and images. Visit us at **www.swmedicalcenter.org/cyberknife** or call us at **(360) 514-CYBR (2927).**

You can also learn more about CyberKnife radiosurgery and get the patient's perspective by visiting the CyberKnife Patient Support Group Web site at **www.cyberknifesupport.org**

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