



CYBERKNIFE®  
RADIOSURGERY

PAINLESS TREATMENT FOR TUMORS  
AND LESIONS ANYWHERE IN THE BODY

## WHAT IS CYBERKNIFE RADIOSURGERY?

CyberKnife® radiosurgery is a precise, painless, non-invasive radiation treatment that can be an alternative to open surgery in certain cases.

Multiple beams of high energy radiation are delivered from multiple points outside the body and converge precisely at the tumor or lesion inside the body. Each



individual beam is not sufficient to cause harm, but the convergence of all the beams at the tumor results in the lesion receiving a very high dose of radiation while sparing nearby normal tissue.

CyberKnife radiosurgery is so precise, radiation beams can be sculpted to small, complex-shaped tumors near critical structures, such as hearing and vision nerves. This ability to accurately irradiate only the tumor and protect healthy tissue allows the CyberKnife to treat many lesions which may be considered inoperable or untreatable with other radiosurgery systems....giving many patients hope. CyberKnife radiosurgery may also be used for other benign conditions such as trigeminal neuralgia and arteriovenous malformations.

## HOW DOES THE CYBERKNIFE WORK?

The CyberKnife is a revolutionary new way of performing stereotactic radiosurgery—it combines two advanced technologies:



■ The first innovation is a lightweight radiation delivery system mounted on a multi-jointed robotic arm. The robotic arm provides unparalleled access to tumors anywhere in the body, reaching areas of the body that are untreatable with other radiosurgery systems and allowing more flexible delivery of radiation for optimum treatment.

■ The second innovation is an image guidance system. This advancement allows the CyberKnife System to locate the tumor throughout treatment and correct for small patient movements, which allows radiation to be delivered without the use of a stereotactic frame.

## WHO WILL BE INVOLVED IN MY TREATMENT?

CyberKnife treatment utilizes a team approach where medical experts collaborate with you as their central focus. Team members may include your surgeon, radiation oncologist, medical oncologist, physicist, radiation therapist and other team members within the hospital.



## WHAT MAKES CYBERKNIFE SO UNIQUE?

### ■ 100% Frameless

The ability of the CyberKnife System to correct for patient movement during treatment spares you from the pain and inconvenience associated with the conventional head frame that must be affixed to the skull with screws. Published studies have shown that frameless CyberKnife radiosurgery is as accurate—if not more so—than traditional frame-based radiosurgery.

## ■ Full Body Capability & Staged Treatment

The unique design of the CyberKnife System allows it to deliver precise high dose radiation not just to lesions in the brain, but to lesions in the spine and other organs throughout the body. In addition, because no frame is required, the CyberKnife System can perform “hypo-fractionated” or staged radiosurgery—where the total radiation dose is divided into 3-5 smaller doses. This is especially beneficial for treating lesions near sensitive structures and larger tumors because it better protects surrounding healthy tissue.

## PAINLESS SURGERY

The CyberKnife System allows you to be treated in a unique radiosurgery suite where painless “surgery” is performed on an outpatient basis, eliminating the risk of complications and lengthy recovery time associated with traditional open surgery.

## BETTER QUALITY OF LIFE DURING & AFTER TREATMENT

The simple outpatient CyberKnife procedure allows you to undergo your treatment and immediately resume normal activities.



## IS THE CYBERKNIFE CLINICALLY PROVEN?

The CyberKnife System is based on radiation technology that has been proven for over 30 years. Thousands of patients have received CyberKnife treatments worldwide, and many clinical studies with the CyberKnife have been published in medical journals.

## WHAT TYPES OF TUMORS CAN BE TREATED?

The CyberKnife System is cleared by the FDA to treat tumors and lesions anywhere in the body when radiation treatment is indicated. Consult with your physician to see if the CyberKnife treatment is right for you.

## WHERE CAN I FIND MORE INFORMATION ON THE CYBERKNIFE?

To learn more, please see the CyberKnife page under the Cancer heading on Baptist's website ([www.mbhs.org](http://www.mbhs.org)). You can find links to a number of resources, including The CyberKnife Society ([www.cksociety.org](http://www.cksociety.org)), a coalition of physicians and affiliated healthcare professionals specializing in CyberKnife radiosurgery. You'll also find links to the CyberKnife Patient Support Group ([www.cyberknifesupport.org](http://www.cyberknifesupport.org)), to Accuray ([www.accuray.com](http://www.accuray.com)), manufacturer of the CyberKnife and to Jackson Neurosurgery and Spine Associates ([www.jacksonneurosurgery.com](http://www.jacksonneurosurgery.com)).



# SIMPLE ..... OUTPATIENT TREATMENT .....

## Step 1: Treatment Setup

### Fiducial Placement

If you are undergoing CyberKnife treatment for a spinal or body (non-head) lesion, you may require a short outpatient procedure to implant several small metal markers (fiducials) near the tumor to enable the CyberKnife System to track tumor position throughout treatment. Lesions in the head do not require this step.

### Making a Mask or Body Mold

A custom soft mask (for head/neck treatments) or body mold is formed and used to help minimize movement during the treatment and ensure your comfort. The process is simple and painless.

### Imaging

A CT scan is performed. Your physicians use the scan to identify the exact size, shape and location of the tumor along with the surrounding vital structures to be avoided.

## Step 2: Treatment Planning

The CT data is downloaded to the CyberKnife treatment planning computer where physicians will use advanced software to customize the number, intensity and direction of radiation beams the robot will send to the target. You do not need to be present during this step.

## Step 3: Treatment Delivery

### Arriving

Wear comfortable clothing and no jewelry. Try to relax knowing this will be a painless procedure. The treatment room is equipped with a flat panel TV and surround sound. If you wish you may bring a DVD to watch or a CD to listen to during treatment. Feel free to bring a list of questions to ask the CyberKnife team. They are there to ensure your comfort and safety.

### Positioning

You will be asked to lie on the treatment table and will be fitted with the custom mask or body mold made earlier during the set-up process. Generally, no sedation or anesthesia is required because the treatment is painless.



### Painless Treatment

During treatment, you will need to lie still. You will be awake throughout the entire procedure, which typically lasts 30-90 minutes depending on the complexity of your tumor. The image guidance system periodically takes x-ray images and compares them to data from the CT scan to ensure the radiation is targeted accurately to the tumor.

### Completion

If you are undergoing single-session radiosurgery treatment, your treatment is complete, and you can usually leave the hospital and resume normal activity immediately. If your physician prescribes a “hypo-fractionated” or staged treatment, you will need to return for additional daily treatments (typically no more than 2 to 5).

### Follow-up

As with any radiosurgery or radiation therapy procedure, follow-up imaging and physician consultation is required to monitor your tumor’s progress.





# Baptist

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