What is pancreatic cancer?
The pancreas is a gland that is located behind the stomach and in front of the spine. Pancreatic cancer develops when cancer cells form in the tissues of the pancreas. Each year there are 33,730 people diagnosed with pancreatic cancer, and 32,300 people die each year from the disease. By the time of diagnosis, many patients with pancreatic cancer are not candidates for surgery.

What conditions can the CyberKnife® treat?

Only your surgeon can tell you if you are a candidate for CyberKnife® treatment, but around 80 percent of patients with pancreatic cancer have been eligible for the CyberKnife®. Conditions that can be treated include:

- Tumors that cannot be surgically removed
- Tumors that have returned after prior surgery, chemotherapy or radiation
- Those who have medical problems and cannot have an operation
- Those with uncontrollable pain

Simple Outpatient Treatment Process

**Step 1: Pre-Treatment Prep**

Prior to radiosurgery, markers are implanted in or near the tumor. The markers are implanted with a small needle without making an incision. They can be seen on the X-ray and the CyberKnife® uses them to locate the precise location of the tumor throughout the treatment.

Four to five days after the markers are implanted, a CT scan and a PET scan are done. The surgeon and radiation oncologist will use the scans to identify the exact size, shape and location of the tumor along with the surrounding vital structures to be avoided. On occasion, additional scans such as MRI or PET maybe required.

**Step 2: Treatment Planning**

Your physicians will discuss how much radiation will be sent to the targeted area. This will help ensure that a sufficient dose is administered to the tumor to destroy it while avoiding the adjacent normal tissue.

**Step 3: The Treatment Arrival**—

Wear comfortable clothing and no jewelry.

**Positioning**—During the CyberKnife® procedure, you will need to lie still. Generally, no sedation or anesthesia is used because the treatment is painless. Patients may be given anti-nausea medication ahead of time.

**Painless Treatment, Verification and Targeting**—The treatment itself involves the administration of radiation beams delivered from different directions. There may be between three and five treatments where the radiation is delivered. Prior to the delivery of each radiation beam, the image guidance system takes X-ray images and compares them to the original CT scan. This information is used to ensure the radiation is targeted directly at the tumor.

**Completion**—Patients usually leave the hospital and resume normal activity immediately following the treatment. CyberKnife® treatment is done as an outpatient procedure.

**Follow-Up**—Follow-up imaging is generally performed to monitor the tumor’s progress. While waiting for your results, stay busy and keep a positive mental state of mind.
Painless Radiosurgery Treatment

The CyberKnife® System from Accuray is the world’s most accurate stereotactic body radiation therapy device. It establishes a new gold standard in stereotactic body radiation therapy by using technology to precisely treat tumors and other lesions anywhere in the body. The CyberKnife® flexible robotic arm provides unparalleled access to previously unreachable tumors. And, because CyberKnife® is noninvasive, doctors can treat multiple lesions and tumors without making a single incision. The CyberKnife® also provides a viable option for those patients previously diagnosed with inoperable tumors.

Here at the Alvin & Lois Lapidus Cancer Institute of LifeBridge Health, the CyberKnife® is used in the treatment of pancreatic tumors. Patients benefit from:

- No incisions
- No pain
- Bloodless procedure
- No anesthesia
- No recovery time
- Quick return to normal activity

How Does the CyberKnife® Work?

CyberKnife® uses a lightweight radiation delivery system mounted on a multi-jointed robotic arm, which provides unique access to tumors. Since it is precise and less invasive, the CyberKnife® is able to reduce harm to areas of the body that surround the tumor or lesion. This increases safety and helps reduce side effects.

CyberKnife® uses guided imagery that allows for unparalleled tumor tracking capabilities. This revolutionary advancement allows the CyberKnife® system to track, detect and correct for slight human movements, such as respiration, during the treatment.

What makes CyberKnife® Unique?

1. **Total clinical accuracy**
   The CyberKnife® System has proven to be the most accurate, real-time, image-guided stereotactic body radiation therapy system in the world. Radiation beams can conform to small, complex-shaped tumors, but mostly avoid an impact on surrounding healthy tissue or organs.

2. **Painless surgery**
   The CyberKnife® System allows patients to receive painless radiation therapy with no incisions, no blood, no anesthesia and no recovery time.

3. **Better quality of life**
   The simple outpatient CyberKnife® procedure allows patients to undergo their treatment and immediately resume normal activities.

Is the CyberKnife® clinically proven?

The CyberKnife® utilizes radiation technology that has been proven for over 30 years. Additionally, over 20,000 patients have received CyberKnife® treatments worldwide.

At Sinai’s CyberKnife® Center, we have treated over 50 patients with pancreatic cancer, the largest group of patients anywhere in the world. We have found that 85 percent of patients who started with severe pain had relief of their pain. Also, 91 percent of the patient’s tumors either stopped growing or shrunk.

Are there any side effects?

Side effects related to CyberKnife® are very few. Some patients experience mild stomach upset after the treatment that an anti-nausea medicine can alleviate.

What types of tumors can be treated?

The CyberKnife® received clearance from the FDA in July 1999 for the treatment of brain and spine tumors. In October 2001, the FDA extended its clearance to include the treatment of tumors and other conditions anywhere in the body. To date, we have treated over 1,000 patients with CyberKnife® at Sinai Hospital and 20,000 patients have been treated worldwide.

Who will be involved during my treatment?

The CyberKnife® Center team will include your surgeon, radiation oncologist, radiation therapist, CyberKnife® nurse navigator, medical physicist and other dedicated team members.

For more information about CyberKnife® and what it can do for you, call 410-601-WELL or visit the website at www.lifebridgehealth.org.