



# LEKSELL GAMMA KNIFE® ICON™ FRAMELESS STEREOTACTIC RADIOSURGERY

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## WHAT IS STEREOTACTIC RADIOSURGERY?

Stereotactic radiosurgery (SRS) is a form of radiation therapy in which radiation is delivered to the patient in one treatment session. Although the procedure is called surgery, there is no actual incision and the procedure is performed on an outpatient basis. It is used to treat selected tumors and non-malignant conditions.

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## WHAT KIND OF RADIATION IS USED IN SRS?

Gamma x-rays are used to deliver SRS. A radioactive isotope called Cobalt 60 emits the radiation. These very small radiation beams are aimed at the treatment site from various angles to attack the target in a complete three-dimensional manner. The goal is to deliver the lowest dose possible to the surrounding tissue, reducing the chance of causing a radiation side effect, while still delivering the maximum dose to the intended site of treatment.

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## WHAT HAPPENS WHEN A PERSON IS TREATED WITH SRS?

The SRS treatment process involves four steps: mask, imaging, treatment planning and treatment delivery. The process begins by fabricating a custom mask and taking three-dimensional picture of your head with a CT and MRI scanner while in the mask. These are used to plan the dose of radiation received.

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## **FITTING THE FRAMELESS MASK**

In preparation for your SRS procedure, the physicist and CT technologist will fabricate a custom mask around your head. During the fitting, the mask is placed in a warming oven to soften the material, which is then shaped to your head. The mask works to minimize the motion of your head during imaging and treatment. The mask system typically takes 15 minutes to fabricate and cool. Patients with long hair should arrange to wear their hair down, straight, and smooth to the head without hair products. Men are encouraged to remove facial hair (i.e. mustache or beard) prior to the mask fitting. Patients should not cut their hair between the mask fitting and the treatment. All jewelry and necklaces should be removed for this procedure.

\*In certain cases, a frame may be necessary for treatment.

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## **IMAGING**

To determine the area of your brain to be treated, the physician will use images from a CT and MRI scanner. This process is called “virtual simulation”. The CT and MRI scanner images will allow your physician to pinpoint the location of your tumor or treatment site for treatment planning purposes.

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## **TREATMENT PLANNING**

The physician and medical physicist will use the three-dimensional images from the CT and MRI to “simulate” treatment by outlining your tumor or treatment site, adjacent critical normal structures and planning the position of the radiation beams. The treatment planning computer will then generate pictures of the dose to the tissue within the radiation beam. This SRS planning process usually takes several hours. When the plan is complete, you will be taken to the treatment room for treatment.

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## **TREATMENT DELIVERY**

The SRS treatment session may take 30 minutes to an hour. To begin, you will lie on the treatment couch inside the mask while x-rays are taken to ensure the placement of the radiation dose. Additional x-rays may be taken periodically throughout your treatment session to ensure accurate positioning. During the treatment delivery it’s important to lie very still, this will help your treatment team during the delivery process.

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## THE TREATMENT TEAM

The radiation treatment team involved in planning your SRS treatments includes the following specialists:

**Radiation Oncologist** – Your Gamma Knife Icon credentialed physician has had special training in using radiation to treat disease and will prescribe the amount of radiation that best suits your condition. Your radiation oncologist will work closely with your neurosurgeon.

**Medical Physicist** – Medical radiation physicists work directly with the radiation oncologist during treatment planning and delivery. They will plan your treatment with the physician and ensure the machine delivers the correct dose of radiation.

**RN or LPN** – Radiation oncology nurses are specifically trained to care for radiation patients. They work with your radiation oncologist to assist you at the time of consultation, during treatment and following treatment. They are available by phone or in person to answer any questions you may have about SRS.

**Radiation Therapist** – Radiation therapists work with the radiation oncologist to administer the radiation treatment under the physician's prescription and supervision. Your radiation therapists check the treatment machine to ensure its precision, properly align the radiation beam to the area of treatment and keep a record of your treatment.

**Neurosurgeon** – Your neurosurgeon works with your radiation oncologist and medical physicist to design the radiation treatment plan.

**Neuroradiologist** – A neuroradiologist is a doctor specializing in interpreting pictures of the brain and nervous system. A neuroradiologist may assist the radiation oncologist and physicist to determine the best placement of the radiation to deliver the highest radiation dose to the intended treatment site while sparing adjacent normal tissues.

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## WHAT ARE THE EFFECTS OF TREATMENT?

External radiation therapy does not cause your body to become radioactive. You do not need to avoid being with others because of treatment. Hugging, kissing and having sexual relations pose no risk of radiation exposure to others.

With SRS, most patients have no side effects. However, side effects may include temporary hair loss, headaches, dizziness, nausea, vomiting, hemorrhage, infection and seizures. These side effects are generally temporary.

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## **HOW IS SRS DIFFERENT FROM OTHER FORMS OF RADIATION THERAPY?**

The treatment is delivered using an advanced radiation treatment machine called Gamma Knife Icon. It is designed to treat relatively small targets in the brain. It is very useful in areas that require pinpoint precision to focus radiation near critical structures. Because the radiation is shaped to conform to the target and uses image guidance, some conditions can be treated more effectively and with fewer side effects than with other radiation technologies.

The Gamma Knife Icon will precisely match the contour of target by using up to 192 individual Co-60 beams to shape the radiation distribution. During treatment, Icon will move the treatment couch to reposition the focus of the radiation to different areas in the brain. While the target receives the full dose, the surrounding healthy tissue only receives a small percentage of the radiation dose.

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## **AFTER HOURS**

If you need immediate emergency medical attention, please dial 911 or go to the nearest emergency room. All other medical attention outside of the center's regular office hours (8 a.m. to 5 p.m., Monday – Friday) will be answered by our telephone answering service who will have a doctor from Mary Bird Perkins Cancer Center return your call.

**TELEPHONE: (225) 767-0847**