What is Gamma Knife Radiosurgery?

Gamma Knife surgery is a unique method that delivers extremely focused radiation beams to targets in the brain. The radiation source used is called cobalt. The shape and dose of the radiation is opti mized to hit only the target, without damaging surrounding healthy tissue.

If you have any questions or need further information, please contact your doctor or the

Gamma Knife Center
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GAMMA KNIFE STEREOTACTIC RADIOSURGERY

ACUSTIC NEUROMA

CENTRO GAMMA KNIFE DOMINICANO
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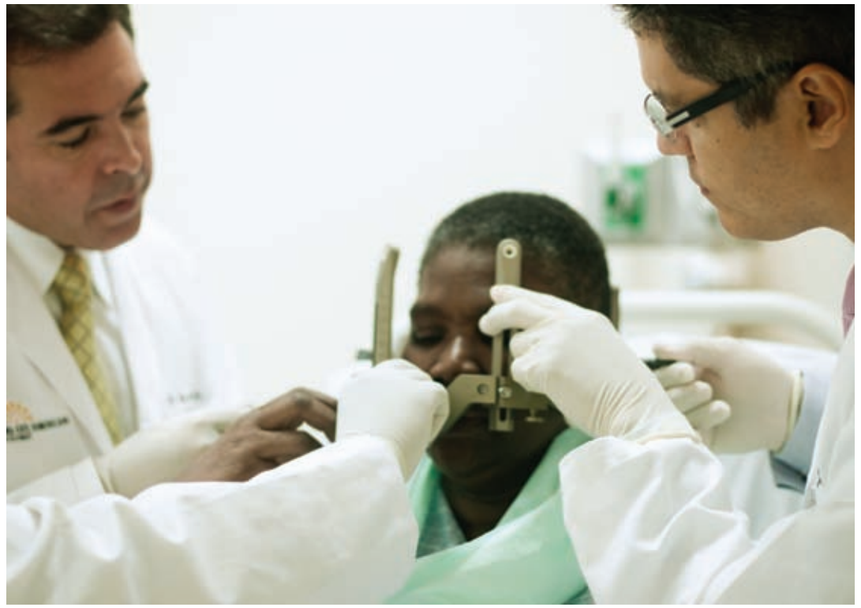
KNIFELESS NEUROSURGERY



What is an acoustic neuroma?

An acoustic neuroma, also known as a vestibular Schwannoma, is a cranial nerve tumour which is benign (non cancerous) and, in most cases, slow growing. The cells that form an acoustic neuroma are called Schwann cells. Unknown events lead to an overproduction of them and as they multiply they form a small tumour which fills the canal that connects the inner ear to the brain.

This pear shape tumour puts pressure on the nerves and the brain. The symptoms of an acoustic neuroma are generally hearing loss, difficulty with balance or tinnitus.

The Benefits of Gamma Knife Radiosurgery

The accuracy of the Gamma Knife Radiosurgery system enables a high dose of radiation to be focused on a very precise area. This means one treatment is generally all that is needed.
One of the major benefits of gamma knife radiosurgery is that it is non-invasive.

Other benefits include the following:

- There is no incision. This means you won't need to shave your head and you'll have no scars to heal. It also avoids the risks that can be associated with open surgery, such as bleeding and infection.
- You're unlikely to have hair loss or nausea
- The procedure is relatively painless and in most cases a general anaesthetic isn't needed.
- We find that most people get back to their normal activities in a day or two (compared to two to six weeks of recovery time with conventional brain surgery).
- Gamma Knife Radiosurgery usually has minimum complications. Indirect comparisons suggest it produces fewer complications than other treatment techniques.

What are the alternatives to gamma knife radiosurgery?

Depending on your general health and the size and position of your acoustic neuroma, the main alternatives are observation (waiting to see what happens) and conventional surgery.

About the Gamma Knife Procedure

There are several steps to the procedure but these will all be done in one day. You will be asked not to eat or drink anything for four hours before your procedure (unless you have diabetes).

1. The Head Frame

One of the key components of Leksell Gamma Knife - the tool that allows your doctor to precisely pinpoint your tumor or problem - is the special stereotactic head frame. This lightweight frame, which is attached to your head with four small screws, ensures that the radiation beams are precisely targeted. The frame also prevents your head from moving during the treatment procedure, which ensures that only the target area in your brain receives radiation.

2. Imaging

After your head frame is in place, a number of advanced imaging tests - such as an MRI or CT scan will be required to precisely locate the size, shape and location of your tumor, lesion or abnormality. If your physician is treating a blood vessel abnormality, an angiogram may also be required. The coordinate markers on your head frame, which are part of the images taken, will help your physician develop an exact plan for your procedure.

3. Treatment Planning

Once your images have been taken, you can sleep, rest or relax while your physician develops your specialized treatment plan. First, your brain images are computerized. Then, using Leksell Gamma Knife 3-D planning software, a treatment protocol is planned. No two treatment plans are alike; every patient's plan is specifically designed to address his or her specific medical condition.

4. The Treatment

Once your treatment plan is complete, you'll lay down on the treatment table and your head frame will be attached to the helmet for your first treatment. You'll be awake during the procedure and able to communicate with your Gamma Knife team through a video and audio connection.

When Gamma Knife Surgery begins, the treatment table, which is much like the one you were on for your MRI or CT scan, will move into the dome section of the unit.

The team will be monitoring your procedure at all times. There may be several treatments lasting anywhere from two to forty-five minutes during your Leksell Gamma Knife session.

Follow Up

The aim of gamma knife surgery for an acoustic neuroma is to stop further growth of the tumour. In some cases the acoustic neuroma shrinks slightly after the procedure but the outcome can be positive even if this doesn't happen.

The majority of small to moderate size acoustic tumours do not need any further treatment after gamma knife surgery.

Your doctor will give you details but it is usual to have a follow-up appointment, with an MRI scan, at one, two, three, five, seven and ten years after gamma knife surgery.

What are the Risks?

As with every procedure, there are some risks associated with gamma knife radiosurgery. In order to make an informed decision and give your consent, you need to be aware of the possible side effects of this procedure.

Gamma knife treatment can sometimes increase the size of the tumour. This is a temporary reaction and is a sign that the procedure is working. It usually occurs about six to twelve months after treatment but can appear up to two years later.

Hearing loss is a natural feature of acoustic neuromas and the aim of gamma knife surgery is to prevent this loss. Two published studies give evidence that gamma knife surgery is successful in preserving the hearing of 60-70% of people who have hearing prior to the treatment. This is significantly better than the outcome among those who do not have treatment. However, these

results also mean that for 30-40% of people a deterioration in hearing cannot be avoided despite gamma knife surgery. This is unavoidable due to the way in which acoustic neuromas naturally develop; it is not a result of any complications from the gamma knife radiosurgery.

The tumour may be in close proximity to other cranial nerves. There is a very small risk of facial weakness, facial numbness or temporary balance problems.

Any exposure to radiation (as in gamma knife surgery) carries the small risk of a malignant tumour developing in the future.

Your doctor will talk to you about the potential risks and side effects of gamma knife surgery for your individual circumstances. If your doctor recommends that your tumour is treated with gamma knife surgery, this will be based on

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