

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 optimized 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
Dominican Republic



CENTRO GAMMA KNIFE DOMINICANO

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**GAMMA KNIFE
STEREOTACTIC RADIOSURGERY**

PITUITARY TUMOUR



CENTRO GAMMA KNIFE DOMINICANO

CEDIMAT
Plaza de la Salud

KNIFELESS NEUROSURGERY



What is a pituitary tumour?

The pituitary gland, a small gland near the base of the skull, is the master gland which controls the hormones within your body. It regulates the hormones produced by the thyroid and adrenal glands as well as those released from the sex organs. Tumours that grow in the pituitary gland may affect the hormonal balance within your body.

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 surgery?

Conventional brain surgery is an alternative, depending on the location of the tumour, and radiotherapy or chemotherapy may be used for small tumours or tumours not suitable for 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 treatment for a pituitary tumour is to stop further growth of the tumour.

If your tumour produces too much of any of the pituitary hormones your hormone levels will be monitored. You will know if the treatment has worked when the hormone levels return to normal, which can take up to two years. Your doctor will give you details but it is usual to have follow-up appointments, with an MRI scan and blood tests, every six months. Depending on your circumstances you may need to have hormone and visual field checks more frequently than this. These will generally be done by your endocrinologist and ophthalmologist.

If you have a tumour that doesn't produce hormones then you will be monitored by MRI scans after one, two, three, five, seven and ten years. You will know the treatment has been effective if, after several years, the tumour has remained the same size or shrunk.

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.

As the tumour is close to your optic system, there is a very small risk you will have some disturbance to your vision after treatment.

The dose of radiation that your pituitary gland will receive during gamma knife surgery may affect your hormone levels. You may have a hormonal deficiency even several years after the radiosurgery and you may require hormone replacement treatment.

Any exposure to radiation (as in gamma knife surgery) carries the small risk of a malignant tumour developing in the future. However the risk is considerably lower than for a serious complication occurring following conventional surgery.

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



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