

Radiosurgery for acoustic neuroma

i **Information for patients**
Stereotactic Radiosurgery



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What is an acoustic neuroma?

- An acoustic neuroma, also known as a vestibular schwannoma, is usually a slow growing benign (non-cancerous) tumour.
- They grow on the eighth, or vestibulocochlear, nerve. This nerve runs from the brain stem to the inner ear and carries signals from the sounds we hear and also gives us the sensation of balance. This is why patients with an acoustic neuroma may have symptoms of deafness, tinnitus (a ringing noise) and balance problems.
- The seventh nerve (facial nerve) runs alongside the eighth cranial nerve. This nerve enables us to move one half of our facial muscles. As the seventh and eighth cranial nerves are very close to each other, it means that a tumour growing on the eighth nerve can press on the seventh, causing a loss of movement on one side of the face (similar to a Bells Palsy).
- The fifth (trigeminal) nerve enables us to feel sensations in our face such as touch and heat. In rare cases the tumour can press on this nerve and cause numbness or, rarely, facial pain.

What options do I have?

There are three options, any of which may be appropriate for individual patients.

- **Watch and wait.** For this the consultant will check the tumour for signs of growth. This is usually done once a year with the aid of an MRI scan. The doctor can then compare the images to see if the tumour has changed in size, as sometimes these tumours stop growing for short periods of time. This observation time may continue for a number of years before any of the other treatment options have to be considered.
- **Open surgery** is a method used to treat this condition. It involves a major surgical operation and up to 10 days, or more, can be spent in hospital. Typically patients are off work for 2 to 3 months

whilst recovering. Although this operation is routine, there are risks with this procedure. You may already be aware of these risks, as your referring neurosurgeon will have already discussed this treatment option with you.

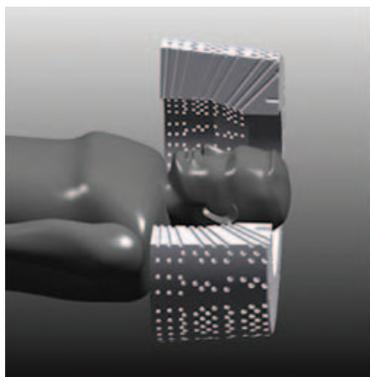
- **Radiation treatment.** There are different types of radiotherapy: fractionated (where the treatment is given Monday to Friday over a period of 4 to 5 weeks); or a single treatment given in one day as carried out on the Gamma Knife.

Treatment with the Gamma Knife

This is not a knife in the conventional sense, and the treatment does not involve anything being cut. During the treatment a high dose of radiation is delivered to the acoustic neuroma. This should stop the tumour from growing further and avoid the need for further surgery, but will not necessarily make it decrease in size.

How does the Gamma Knife work?

Gamma Knife PFX - Royal Hallamshire Hospital



The Gamma Knife works by focusing beams of gamma radiation on the target area. It has the ability to treat a very small target area without affecting any surrounding tissue.

Gamma Knife stereotactic radiosurgery is used exclusively for the brain, head and neck.

Success rates

We have completed a review of over 230 patients with this type of tumour who were treated with the Gamma Knife. Of these, 223 (97%) were successfully treated with the Gamma Knife, whilst only 7 (3%) had to have surgery after their treatment.

Neurofibromatosis (NF2)

This is a rare genetic condition that involves acoustic neuromas. If you have this condition, you will generally have been seen in a specialist NF2 clinic. Given the complexity of NF2, you are seen and advised on an individual basis with specialist support.

How many times do I have to come to Sheffield?

You may have had some of your questions answered by your referring consultant. You may also have had information from other sources (such as your GP, the internet, or other patients) which may need to be put into context. Indeed you may have had contact with our office and received some answers from our staff.

Although you may have received some information from these sources, it is usual to offer an outpatient appointment for everyone referred to us. Most patients find it worthwhile to come and see one of our consultants and meet other members of the treatment team. We would then plan on an admission for treatment which may involve a stay of up to two nights in Sheffield. Your accommodation whilst undergoing treatment will be discussed, if needed, with you at your consultation with a radiographer.

We must seek your consent (permission) for any procedure or treatment before it takes place. Staff will explain the risks, benefits and alternatives where relevant before they ask for your consent. If you are unsure about

any aspect of the procedure or treatment proposed, please do not hesitate to ask for more information.

When do I have to arrive at the ward?

You will be advised of your admission time to arrive at the ward. You will receive in the information pack a list of nearby hotels, bed and breakfasts and other accommodation.

What will happen on that day?

You will be received by a member of staff who will show you to the ward. You will meet with the radiosurgery team who will take your history, check you for general medical problems (if this was not done at your outpatient appointment) and will prescribe any additional medication necessary. Some radiosurgery patients are prescribed a short course of Dexamethasone and Lansoprazole. These will be fully explained to you when you attend. It is usual for patients to continue with their own medication whilst undergoing radiosurgery. We may also require blood tests in preparation for the treatment day.

You will have a chance to meet the therapy radiographer, who will go over the procedure with you. If you did not complete your consent form at clinic this will be completed by the medical staff on your admission.

What will happen on treatment day?

We need to target the tumour accurately. In order to guide us, we use a metal frame as a reference. On the morning of the treatment, one of the medical staff will attach the frame to your head. This involves giving you four local anaesthetic injections into your scalp (two in the forehead and two in the back). When the area feels numb, four pins will be tightened to hold the frame rigidly to the skull. This causes pressure but the feeling wears off after a few minutes.

There is no drilling involved and we do not need to remove any hair. You will have the frame attached for the rest of the day, as all measurements are taken using the frame as a reference.

You will then be taken to the MRI scanner to have images taken. You will be familiar with these from your previous experience. Next the radiographer will take you to the Gamma Knife Suite. There you will wait for the treatment plan to be ready. This may take an hour or two. When the plan is finished, the radiographers will carry out the treatment.

You are welcome to have a family member with you all day if this would make you feel more comfortable.

Can the treatment 'miss' its target?

No. There are many safety measures in place which ensure that the lesion is accurately targeted. The frame is the single most important part in ensuring this.

What do I feel during the treatment?

The frame, which at this point will still be attached to your head, will be positioned and fixed into the Gamma Knife. The treatment will be similar to having another scan. You will lie on a couch, listen to music/audio books and will feel no pain. Claustrophobic patients may find the confined space difficult but the space is larger than the MRI scanner. We have an intercom system so it is possible to talk to the radiographers at any time.

What happens after?

We will remove the frame, clean the points where it was attached and take you up to the ward. You may feel tired or even have a headache that afternoon, as a result of the frame application and the long and busy day. Local patients may go home that evening but people from

further away may need to stay in Sheffield overnight. This may involve an overnight stay in hospital or nearby accommodation dependent on your consultant's wishes and your preferences. In the morning, if you are in hospital, you will be visited by a member of the team and discharged home. Your follow-up will be carried out either in Sheffield (if you are a local patient) or by your referring clinician (if you came from another unit). We usually recommend a clinical review by your consultant about 6 months later and MRI scans annually, at least initially.

The consultants in the radiosurgical unit will continue to advise you on the management of your case and we remain interested in your progress. As a centre with over 35 years' experience treating many rare conditions, we regularly carry out clinical audit, service evaluation and research projects. The information we gather in these exercises helps to build on our understanding of radiosurgery and allows us to better inform both you and future patients, and may improve our service and treatment. The use of anonymised data about your treatment and follow-up may be used in these activities. If you wish to opt out of us using your anonymised data in this way, please tell a member of the radiosurgical team when you attend the clinic. They will record this on your records and it will in no way affect the treatment or follow-up that you receive from us.

Are there any side effects and complications?

Apart from the effects of the local anaesthetic used for the frame application, most patients will have no immediate side effects. You may have a headache by the end of the long day of treatment, mainly due to the frame.

As an acoustic neuroma is outside of the brain, although inside the skull, oedema or swelling in the brain after a Gamma Knife radiosurgical treatment is rare.

The ear however, can be affected. Around 75% of patients maintain their hearing at its pre-treatment levels but 25% may experience some continued deterioration. Some patients do describe a variety of ear symptoms that are hard to quantify such as a 'fullness' in the ear or a change in tinnitus. These typically settle without treatment.

The risk of damaging nearby nerves (such as facial and trigeminal) is very low, only around 1%.

Hydrocephalus, which is a build-up of fluid in the brain, is a rare complication of acoustic neuromas and can occur with or without a radiosurgical treatment. It is only really seen in tumours which are at least 2cm in diameter. If this occurs, it can be treated with a shunt (thin tube) which is a relatively small neurosurgical procedure.

We believe that with the very high rates of tumour control we are achieving, and the very low rate of side effects and problems, that more patients are choosing radiosurgery as their preferred way of managing acoustic neuromas.

We are already seeing this, with an increasing demand for this service. As a result, we are currently treating around 150 acoustic neuromas each year, and are very happy to offer this service in Sheffield.

(The results discussed above are for single acoustic neuromas which is the majority of our patients. We would advise NF2 patients of risks on an individual basis.)

Will I lose my hair?

No. Your hair is not shaved for the treatment and you will not lose any hair afterwards.

Will I take any tablets?

You will continue your usual medication. Please bring all your own medication from home with you when you attend.

During your stay, you may also receive Dexamethasone, a steroid used to add extra protection to the brain during treatment but you will not take any home. This is generally combined with Lansoprazole (antacid).

Frequently asked questions

Q. Will the treatment cause the tumour to become a cancer?

A. This is a theoretical risk with any form of radiation to any part of the body, tumour or not. The vast majority of acoustic neuromas are benign (non-cancerous), but malignant (cancerous) changes have been described with or without radiation. This may affect less than 1 in 1000 acoustic neuromas and, as acoustic neuromas themselves are rare, the overall risk in a population is extremely low. In a study tracing all of our UK patients and totalling 60,000 patient years of data, we could find no increased risk of malignant tumours after radiosurgery.

We conclude that the risk of malignant change with radiosurgery is extremely small, especially when this is compared with the risks of open surgery.

Q. Will I be radioactive after treatment?

A. No. When the machine is switched off after your treatment is completed, the radiation stops and does not stay in your body.

Q. Can I drive following radiosurgery?

A. There are no DVLA restrictions from driving after radiosurgery for treatment of acoustic neuromas. However, we would not recommend patients drive themselves home on the day of treatment.

For further information

Refer to our web site:

- www.gammaknife.org.uk

Email us at:

- Gamma.Knife@nhs.net

Contact the self help group

British Acoustic Neuroma Association (BANA):

- 01246 550011
- www.bana-uk.com
- admin@bana-uk.com

Please use this space to jot down any questions you may have for the consultant when you come to the clinic.



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