

v) When can I get back to normal activities?

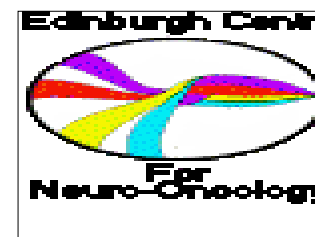
You should probably take a few days off work, as having the treatment can be quite stressful. However, once you are back to normal, there is no reason to stay off work.

vi) When is my follow-up appointment?

You will be seen in the Neuro-Oncology clinic 4-6 weeks after your treatment. This is to make sure you are well. If, however, you have any problems before this clinic appointment do not hesitate to contact us. After this appointment you will usually be seen at six months and then every year. The doctor will let you know when you should have any more scans.

Edinburgh Centre for Neuro-Oncology

Stereotactic Radiotherapy



1) What is stereotactic radiotherapy?

“Stereotactic radiotherapy” uses a 3-dimensional co-ordinate system and a special head-frame to very accurately treat small abnormalities in the head. Very small beams of powerful x-rays (less than 4cm diameter) are then used to treat the lesion. You may have also read about stereotactic radiosurgery; this is the same technique.

We use this to treat a number of conditions, the three commonest indications are:

- 1) Arteriovenous malformations (AVM) -a condition where abnormal blood vessels develop in the brain.
- 2) Acoustic neuroma (vestibular schwannoma) – a benign growth that occurs on the balance and hearing nerve.
- 3) A solitary brain metastasis – when this is a single area of spread of a cancer to the brain from somewhere else in the body.

Planning of stereotactic radiotherapy is a complex process, which involves several stages and a whole team of people.

Who is on the stereotactic team?

Doctors Sara Erridge
 Anna Gregor

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Physicists Carolyn McKerracher
 Linda Carruthers

Lead Radiographer
 Nicola Ace

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You will then be taken round to the treatment unit. You will lie on the treatment table and the box will be attached to the frame. The radiographers will aim the treatment machine at the centre marks on the box. The box will be removed before the beam is switched on.

During the treatment you should lie still, but you can breathe and swallow as normal. You will not feel anything, but you will hear the noise of the treatment unit when the x-rays are on. You will notice that the machine will slowly move around your head. It will not touch you. Each arc takes about four minutes to deliver, but as the treatment table has to be moved between each arc it takes between 20-40 minutes to complete your treatment.

The radiographers must leave the room when the X-rays are switched on, but will watch you on a TV monitor. If at any time you wish to stop the treatment or wish the radiographers to come in, just lift your hand.

iii) How often will I need to come for treatment?

Most conditions treated with stereotactic radiotherapy are treated in a single treatment. However, sometimes your doctor will recommend that the treatment is delivered in several shots or fractions; for example, we often use six fractions to treat an acoustic neuroma. Your doctor will tell you how many fractions are recommended.

iv) How will I feel after treatment?

You may feel tired for a day or two, but people often feel nothing. If the treatment area is near the surface of the brain there is a small risk of a seizure (fit) in the days following the treatment. This is usually only a problem in people with a history of seizures. If this happens and you are worried contact us on the numbers above.

iv) How is my treatment planned?

A treatment plan is made especially for you, on the special stereotactic planning computer. All the data from the various scans you have had (CT, MR, angiogram) are entered into the computer, and the physicists design the treatment plan. Your plan will use between 3 and 6 beams of x-rays, which move around your head during the treatment, like an arc. Each arc is aimed at the lesion from different directions. These directions are chosen to avoid the sensitive parts of your head, such as your eyes and eye nerves. By using several moving beams of X-rays we can concentrate the treatment on the abnormality, but limit the dose to healthy parts of your brain.

4) The treatment itself

i) How should I prepare for treatment?

When stereotactic radiotherapy is given as a single radiotherapy treatment there is a risk of swelling of the area immediately after the treatment. To prevent this we recommend you take 4mg dexamethasone (a strong steroid) on the breakfast, lunch and teatime of the day of treatment, and the day after treatment. We will give you a letter to take to your GP to ask them to prescribe this for you. If you are already on dexamethasone, we usually recommend that you increase the dose by 8mg (4 x 2mg tablets) on these days. When the treatment is delivered over several days it is not necessary to take steroids. Other than this no special preparation is required.

We recommend that you do not drive home after the treatment, but suggest you ask a family member or friend to bring you for your treatment.

ii) What happens on the treatment day?

Your frame will be fitted and the measurements in the depth helmet taken. Pictures will then be taken on the simulator. The frame may be fitted one or two times but we will not proceed with treatment until the team is agreed that the frame fit is good.

2) Preparation for Treatment

i) The stereotactic frame.

The special frame is known as the GTC frame (named after the doctors in London who designed it). It fits to your head using a mouth-bite and an impression of the back of your head. During the radiotherapy it is attached to the treatment couch to allow treatment to be given very precisely.

The impressions of your mouth are made by the treatment radiographers. It is quite a lengthy procedure and can take two to three hours, but we need to make sure that the frame fits your head as perfectly as possible.



ii) Is the frame painful to wear?

The frame has to be fitted very tightly to your head. After about an hour, the top of your head can start to get a bit sore. You should normally not have to wear the frame for any longer than 1½ hours at any one time. The headache will disappear as soon as the frame is removed. At all times you will be able to move your lower jaw and you will still be able to speak and swallow. Your breathing will not be affected, although you may find it easier to breathe through your nose.

All of the radiographers, physicists and doctors who are involved in the stereotactic treatment have been fitted with the frame and you can ask them how it felt.

iii) What if I don't have any teeth?

The mouth-bite can only be made if your teeth and/or gums are in good condition and that is why we have to make sure that a dentist has assessed your mouth beforehand. We can make a mouth-bite if you have no teeth, but sometimes we may advise that it would be better if we used a different type of frame. This frame is temporarily attached to your skull, under local anaesthetic.

iv) How often do I have to wear the frame?

The frame will be custom-fitted to you on one or maybe two occasions. You will then be fitted again when you come for your CT scan. If you have an AVM you will need to wear it for your angiogram. You will also wear the frame every time you come for treatment.

v) How do you know the frame is fitted correctly?

When you are fitted for the frame for the first time, the radiographers will also fit you with something known as the "depth helmet":

The radiographers will take some measurements with a special ruler, in each of the holes around the helmet. This tells us the position of your head, inside the frame. Each time you come for a scan or treatment, the depth helmet will be used. You can also help us to make sure that your frame fits perfectly. Try to remember how the frame feels on your head and around your teeth. You should tell us if you think it feels any different from the time you were originally fitted.



As a final check, before any scans, and before your first treatment, we will also take some x-ray photographs of your head in the frame, on a machine known as the "Simulator". This machine "simulates" your treatment. When we take the photographs you will also wear a box, which helps us to check the position of your head inside the frame.

3) Planning the treatment

i) Why do I need a CT scan?

All patients having stereotactic radiotherapy need to have a CT scan wearing the frame so that the computer can calculate the coordinates of the whole of your head. We then use the information from the scan to design the treatment.

ii) Why do I need another MR scan?

An MRI scan is used in the planning of some types of conditions, which show up better on MR scans than on CT scans e.g. acoustic neuroma. Although you may have already had an MR scan, it may not have been the special type that we need to plan your treatment. You do not need to wear the GTC frame for the MR scan because the MR scan is then "fused" (i.e. combined with) with the CT scan using a special computer programme to make one very useful scan:

iii) Why do I need another angiogram?

An angiogram is the best way to see an AVM and is only needed for stereotactic radiotherapy for this condition. Patients with an AVM will already have had an angiogram to make the diagnosis. Though you will have had previous angiograms, we need to carry one out while you are wearing the frame, so that we can get the correct coordinates of the AVM. This time you will wear the GTC frame and the box and we will take x-ray pictures of your head and these will be scanned into the computer.