



# Stereotactic radiotherapy for meningiomas using CyberKnife

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This leaflet has been given to you to provide some written information about the treatment that is being planned for you in addition to the explanations that you have received from your doctor. If you have any questions, please get in touch with the specialist radiographers (contact details can be found at the end of this leaflet).

## What is a meningioma?

A meningioma is a tumour of the meninges, which are the protective membranes around the brain and spinal cord. A meningioma can start in any part of the brain or spinal cord. The majority of meningiomas are benign which means they do not spread and typically grow slowly over years. However it is often difficult to accurately predict the rate of growth of benign meningiomas. Meningiomas make up nearly a quarter (25%) of all primary brain tumours. They are most likely to be found in middle-aged or elderly people. Meningiomas are more common in women than in men. Symptoms vary according to the location of the meningioma.

## What is stereotactic radiotherapy?

Radiotherapy is a treatment which involves precisely targeting high energy X-rays (ionising radiation) at a specific area with the aim of destroying any abnormal cells there.

Some patients may benefit from having highly focussed and accurate radiotherapy known as stereotactic radiotherapy (SRT). If only one treatment is given, it is often referred to as stereotactic radiosurgery (SRS).

At the Queen Elizabeth Hospital Birmingham, stereotactic radiosurgery has been given for many years using a head frame and a modified conventional radiotherapy machine (linear accelerator). We are now giving stereotactic radiosurgery and stereotactic radiotherapy using a CyberKnife unit. This unit has a radiotherapy machine, which can generate high energy X-rays, mounted on a robot arm. This means that the treatment can be delivered from many different angles, so that the normal tissue around the area being treated receives a much lower dose than with conventional radiotherapy. It enables high doses of radiation to be delivered with sub-millimetre accuracy, as the CyberKnife has the ability to track the tumour's position throughout the treatment.

It is extremely important that you are not pregnant or become pregnant during your course of radiotherapy. Even a small amount of radiation may

damage an unborn foetus so it is very important to let the radiographers know at once if you think there is even a possibility that you may be pregnant before any radiation exposures are given on the CT scanner or CyberKnife unit.

Having radiotherapy does not make you radioactive. There is no need to restrict your contact with other people, including children and pregnant women.

## Why do I need to have stereotactic radiotherapy?

Stereotactic radiotherapy and radiosurgery are suited to small clearly defined tumours which are difficult to remove. Having considered your case, the team of doctors (surgeons, oncologists and radiologists) involved in treating meningiomas have proposed stereotactic radiosurgery or radiotherapy as a treatment option. If you are unsure why this option has been suggested to you, please feel free to ask.

## Are there any alternative treatments to stereotactic radiosurgery or stereotactic radiotherapy?

In many cases meningiomas are treated with surgery alone or observation. You can discuss with your consultant (neurosurgeon or oncologist) whether such alternative options are suitable for you. Stereotactic radiotherapy may be the treatment of choice if the tumour is difficult to remove surgically, or if surgery is likely to be associated with high risks of side effects. Other forms of radiotherapy can be used to treat meningiomas including conventionally fractionated radiotherapy (delivered over many weeks) or image-guided intensity modulated radiotherapy known as IG IMRT. If you would like any further information on these techniques please ask your clinical oncologist.

## What are the benefits of stereotactic radiosurgery or stereotactic radiotherapy?

For most patients the aim of stereotactic radiotherapy is to stop the meningioma from growing and prevent further disability. This disability will depend upon the location of the meningioma. Your consultant will discuss this in more detail when you first see them. If you do decide to have stereotactic radiotherapy, you will be asked to sign a consent form, stating that you have been informed of the risks and benefits. This does not mean

that you cannot change your mind about your treatment choices.

## When is stereotactic radiosurgery or stereotactic radiotherapy given?

Stereotactic radiosurgery is given in a single treatment on a weekday and stereotactic radiotherapy is given on consecutive weekdays. The treatment is delivered in the CyberKnife suite in the radiotherapy department in the Cancer Centre at the Heritage Building (Queen Elizabeth Hospital Birmingham).

## What needs to happen before I start stereotactic radiosurgery or stereotactic radiotherapy?

Stereotactic radiotherapy requires appropriate preparation and has to be carefully planned. Firstly, you will have an appointment with a radiation oncologist in an outpatient clinic who will explain the details of the planned therapy. After this appointment, we will organise some imaging which you will need to have done in addition to any previous imaging you may have had. This will include a planning CT scan which is done within the radiotherapy department and a MRI scan which is done in the new QE.

## What needs to happen for my stereotactic radiosurgery/stereotactic radiotherapy to be planned?

Your first visit to the radiotherapy department is to the Mould Room where the mask is made. This mask is made several days or weeks prior to starting radiotherapy. It fits over your head and is attached to the treatment couch. The mask is needed to ensure that you are in exactly the same position as you were for your planning CT scan so that the treatment can be given very precisely to the correct area.

Making the mask involves warming a sheet of a thermoplastic material so that it softens and can be gently draped over your head and moulded to you. The mask then needs to stay in position for about ten minutes whilst it hardens and sets. The plastic is warm and feels a little like having a warm flannel over your face. The plastic has small holes in it so that you can still breathe easily. The mask must be a close fit in order to be effective but it should not be painful.

After the mask is made, you will have a CT scan which is done with the

mask on. The radiographers will put some marks on the mask so that when you return for your radiotherapy treatment it will be possible to have you lying in exactly the same position. It is important that if you are uncomfortable or struggling with the position, you tell the radiographers.

After your CT scan the radiographers will give you the details of your first radiotherapy treatment appointment and show you where the CyberKnife suite is.

The radiographers will ask if you have a preference for a morning or afternoon appointment for your treatment and they will pass this onto the treatment radiographers. Please be aware that although the treatment radiographers will always try their best to give you appointments around your preference, it may not always be possible to accommodate these requests. If you require hospital transport for your treatment, please discuss this with the CT radiographers.

In between having your CT scan and starting treatment a lot of work needs to be done, by your doctors and the team of radiographers and physicists, to plan and check your treatment.

## What happens when I come to the CyberKnife unit?

Your treatment will be on a weekday. This appointment normally takes between 1–1.5 hours. The radiographers will explain what is going to happen and show you the CyberKnife unit. The machine moves around the room and can make some noises. The radiographers will position you in the same way you were for your planning CT scan. The radiographers will then move you into the correct position.

The radiographers will then take some X-ray images to confirm your position before they start the treatment. They may come in and out of the room and adjust your position slightly. The treatment machine will then move around you so that the treatment can be delivered from lots of different angles. The machine will only be on for brief periods before moving to the next position. You will not feel anything whilst you are having radiotherapy, but you may hear the machine buzzing on and off and see the CyberKnife moving around you.

An example of a mask



## CyberKnife



Whilst you are on the treatment couch, the radiographers will continue to take and assess X-ray images during your treatment to ensure your position remains perfect. Assessing these images may take some time and necessitate discussion with other members of the team such as physicists and doctors.

These images are taken to ensure that you are in the correct position; they cannot be used to assess how well the treatment is working. These images involve a very small additional dose of X-rays. However these images are essential to ensure accurate treatment and overall serve to reduce the risk of side effects.

The radiographers will ask you to stay as still as possible so that the treatment can be given to the correct place. The radiographers cannot stay in the room with you whilst the machine is on but they are operating the machine and watching you all the time via cameras. If for any reason you need the radiographers, just raise a hand and they will immediately stop the treatment and come in. You are welcome to bring a CD with you so you have something to listen to whilst you have your treatment.

## CCTV Use

The treatment rooms are monitored during your preparation, positioning and treatment delivery by television cameras. This is part of ensuring the accuracy of your treatment and your safety and wellbeing in the rooms at

all times. We assure you that the camera image feed is live and it is not possible to make a recording. The images are viewable on screens situated in the machine control areas. The control areas are only accessed by authorised radiotherapy staff, some of whom may not be directly involved in your care at the time. If you have any concerns about your privacy or dignity, that you have not already discussed then please do not hesitate to highlight your concerns during the information discussion with the radiographers at your first appointment.

## What side effects may occur during my stereotactic radiosurgery or stereotactic radiotherapy treatment?

Stereotactic radiosurgery or stereotactic radiotherapy has fewer side effects than conventional radiotherapy as less healthy tissue is exposed to high doses of radiation. However, you may experience some side effects.

Side effects will not happen or be the same for all people and will depend upon the location of the meningioma. Short term side effects may include tiredness and nausea.

Swelling of the meningioma can occur following treatment. This can be weeks to months after treatment. The symptoms associated with the swelling will depend upon the location. Short term treatment with steroids or occasionally a surgical procedure may be required under these circumstances. Long-term side effects are classed as those that are present more than three months after radiotherapy. Severe effects are relatively infrequent but can include damage to parts of the brain close to the meningioma leading to disability. This will very much depend upon the location of the meningioma. Your consultant will discuss the possible side effects in more detail before you consent to treatment and these will be detailed on your consent form, which you will be given a copy of. If you are unsure about any of these side effects, please ask to discuss them further with your consultant (oncologist or neurosurgeon). Any treatment given using ionising radiation carries a very small risk of causing a cancer many years after treatment.

When you come for treatment you will be seen by the radiographers and you will be given the CyberKnife radiographers telephone number. If you have any concerns or questions, please speak to the radiographers.

## Driving after treatment (DVLA guidelines)

Please speak to the CyberKnife Radiographers/Clinician to check how long you should not be driving for after treatment.

## What happens after my treatment?

You will have a follow up appointment with the oncology consultant (radiotherapy doctor) around six weeks after treatment. You will then go back to seeing your referring consultant at about six months after you have had your treatment. They will organise follow up scans; the first of which is normally carried out about one year after your treatment.

## Other information

Car park D is directly opposite the doors to the Cancer Centre on the hospital drive. Please park here and bring in the ticket you have taken to access the car park with you. The radiographers in the treatment room will exchange this for a prepaid ticket so that you can exit the car park without paying. This free car parking arrangement has been negotiated for patients who are attending for radiotherapy planning or treatment appointments only. The radiographers will not be able to give you a ticket if you are attending for a follow up appointment.

## Contact details

**CyberKnife radiographers telephone: 0121 371 5060**

**Mitchell Hickman, CyberKnife/SRS Lead Radiographer**

**Telephone: 0121 371 7703**

If you cannot get through to a radiographer, please leave a message so one of the radiographers can call you back. This telephone will be checked regularly throughout the week but is not checked at weekends.

CyberKnife website: [www.uhb.nhs.uk/cyberknife](http://www.uhb.nhs.uk/cyberknife)

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