STEREOTACTIC RADIOSURGERY FOR BRAIN METASTASES

PATIENT INFORMATION LEAFLET
**Stereotactic Radiosurgery for Brain Metastases**

You have recently been diagnosed with one or more brain metastases. This leaflet will explain what brain metastases are and how they can be treated.

**What are Brain Metastases**

A brain metastasis is when cancer cells from a primary tumour in the body move through the blood stream to the brain and start to grow, producing a secondary tumour. Up to half of patients with advanced cancer eventually develop brain metastases.

**How are Brain Metastases Treated?**

The treatment recommended for you depends upon the following factors:

- Your primary cancer diagnosis
- The extend of your primary cancer
- Any other cancer treatments that are planned for you
- The number and size of your metastases
- How fit and well you are

However, the options include:

- **Surgical resection:** This is an operation to remove the lesion. It is used for metastases that lie close to the surface of the brain making it easier to remove them. It is important that the patient has good overall fitness and that there are only one or two metastases. It is a good option if a metastases is causing symptoms from swelling (oedema) as surgical resection will often give quick relief of these symptoms.

- **Whole brain radiotherapy:** This is using standard radiotherapy to treat the whole brain. The treatment is usually given as 5 or 10 daily treatments over 1 to 2 weeks. It is probably the most common treatment for brain metastases because it can treat multiple metastases of any size in any part of the brain. It is quick to arrange and very easy to cope with.

- **Stereotactic radiosurgery (SRS):** This uses very focused X-ray radiation beams. Some patients are not suitable for an operation because they are not fit enough or because of where the metastases are in the brain. A patient may have SRS if they have up to 3 small metastases that are usually less than 3cm in size. The treatment is usually given in a single treatment (fraction). It can be given on its
own or in combination with whole brain radiotherapy. Occasionally larger lesions maybe treated in several fractions.

The neuro-surgeons, neuro-radiologists, neuro-oncologist (who delivers the SRS), your main oncologist (who is responsible for your primary tumour) and a neurologist will discuss the best way to treat your brain metastases at a multi-disciplinary meeting. We will then discuss these options with you in the clinic.

A diagnosis of brain metastases means you must surrender your driving licence to the DVLA as you are not permitted to drive for a period of 2 years. This is due to the increased risk of seizures with a diagnosis of brain metastases.

**What does the planning of the SRS involve?**

Preparing for your treatment involves a number of steps. You will need more than one appointment for this planning process.

First you have to have a special mask made (see picture). You will need to wear this during the planning and delivery of the treatment to keep your head perfectly still.

**How is the mask made?**

The mask is made from three pieces of plastic sheeting heated in warm water to make them flexible. It takes about an hour to make your mask. The back part is made by taking an impression of the back of your head with the warm plastic. We then wait for it to cool down and become rigid. This takes about 15 minutes. The straps on the front are made in the same way and again left to cool for another 15 minutes. Finally, the front part is made. Ideally this should be left for 30 minutes so it does not shrink once it is removed.

The mask has to be tight to do its job, but it should not be uncomfortable. There are small holes in the plastic and you will be able to breathe normally. Though you will probably want to close your eyes for the final stage you can open them in the mask and see out.

You might want to bring a music CD with you for this appointment to help you relax.
You will then have a CT scan wearing the mask. This involves putting the mask on and going through a scanner shaped like a large doughnut ring. It is painless and takes about 15 minutes. This gives us the shape of your head for the planning calculations. Sometimes we may give an iodine contrast injection.

MRI scan

You should already have had an MRI scan to check that you do not have any more than 3 metastases. We will also use this to help us plan where the SRS treatment needs to be given.

It is important that we have all both sets of images (planning CT scan and MRI scan) to decide exactly where we need to target the SRS treatment.

Producing your treatment plan

Over the next few weeks the SRS team will design your treatment.

The CT and MRI images are fused in a computer system. The neuro-radiologists and radiation oncologists identify the metastases that we need to target. They add a small (3mm) margin to this. They will also outline any structures that can be sensitive to radiosurgery (eye nerves, brainstem). The physicists then select the best way to treat your metastases.
The system we have in Edinburgh (Brainlab / Novalis Tx) allows us to treat either with beams that move around your head (arcs) or static (fixed) beams. We will select the one which shapes the area receiving the highest doses as close as possible to the shape of your metastasis. Once the plan is ready radiation oncologist will check it and prescribe your treatment.

For larger lesions we may decide to give the treatment in a number of shots (up to five) instead of a single treatment. The treatment data is then transferred to the radiotherapy machine (Linear Accelerator).

**WHAT HAPPENS ON THE DAY OF TREATMENT?**

The SRS can sometimes cause swelling and we use steroids to reduce the risk of this. Most patients with brain metastases will have been started on steroids when they were diagnosed. If this is the case we normally advise you to double the dose of steroids on the day(s) of treatment and the day after. If you are not already on steroids we advise a dose 6mg twice daily of dexamethasone on the day of and the day after treatment. We will arrange your steroids when you attend for clinic.

*Steroid instructions:* Take **6mg dexamethasone (or double your normal dose)** after breakfast and then again after lunch on the day of your treatment and the day after your treatment.

**THE TREATMENT**

When you come for your treatment you should go to the stereotactic radiotherapy machine (called LA7). The treatment radiographers will ask you to lie on the treatment couch. They will put on your mask. The radiographers will then place a frame over your mask. This has special balls which are used to realign you into exactly the same position as you were in when we performed the CT scan. The treatment couch will move a few millimetres.

Once the radiographers are happy you are in the correct position they will leave the room and the treatment starts. It can be controlled completely from outside the room but the radiographers watch you on a camera – wave your hand if you have a problem.

If arcs are being used the machine will slowly move around your head. If static beams are being used it will stay put for about 60 seconds then move. The machine buzzes but you should not feel anything. Some patients occasionally smell ozone (smells like the sea). The treatment should take about 20 minutes in total.
WHAT HAPPENS AFTER THE TREATMENT?

Immediately and up to one month: You can go home afterwards. It is probably a good idea to take it easy for a few days. Take your steroids as directed. Some patients feel a bit tired. Some patients get a bit of a headache. If this does not settle with simple pain killers (e.g. paracetamol) please contact us (see details below). Very occasionally patients need steroids for longer because the treatment causes swelling in the brain. Also there is a small risk of a seizure (epileptic fit) following the procedure. This is most common in people who already have seizures but can occur for the first time after SRS. If this happens contact us. Some patients with a metastasis close to the surface of their brain temporarily lose a small amount of hair over that area. If you have any concerns about side effects, please contact us.

One to 12 months: We will see you in the clinic 4-8 weeks after your treatment. This is just to check how you got on and to answer any questions. Sometimes in the first twelve months a reaction to the treatment occurs which requires steroids.

The main complication is radionecrosis. This is where the part of the brain that was treated with the x-rays is damaged. This can cause local swelling. We can treat it with steroids but occasionally patients need an operation to remove this area. Sometimes a permanent problem develops.

Further follow-up: You will continue to be seen by the oncology team looking after your primary tumour for on-going assessment and treatments.

WHAT ARE THE SIDE EFFECTS OF THE TREATMENT?

Most have been mentioned above, but in summary

Immediate: occasionally tiredness, headache, seizures and hair loss
First year: swelling needing steroids
One year to ten years: radionecrosis

WILL THE SRS WORK?

If you have a single metastasis treated with stereotactic radiotherapy you will benefit both in terms of living longer and with good quality of life. Treatment for more than one metastasis will help you to maintain a good quality of life. There is currently no evidence for use of SRS for patients with more than three metastases.
**WHO DO YOU CONTACT IF THERE IS A PROBLEM?**

During the planning stage / prior to treatment contact the stereotactic radiographer. The radiographer can also answer questions about the treatment and explain in more details the treatment process.

After the treatment contact Dr Erridge and Dr People’s secretary (Mon-Fri 8.30-16.00). If however, it is a problem that cannot wait, then contact the on-call Oncology Specialist Registrar via the WGH switchboard 0131 537 1000

**OTHER SOURCES OF INFORMATION**

CancerHelp UK  [http://www.cancerhelp.org.uk/](http://www.cancerhelp.org.uk/) : this is a website run by CRUK and provides comprehensive information on all cancer types.

Scottish Adult Neuro-Oncology Network Website  [http://www.neurooncology.scot.nhs.uk](http://www.neurooncology.scot.nhs.uk) – this is a clinical network of all professionals working in the brain tumour field in Scotland. There are links to some more pictures of the Novalis Tx with Dr Erridge as the model.

**THE SRS TEAM**

Radiation Oncologists (Clinical Oncologists) – doctors trained in the use of therapeutic X-rays

Dr Sara C Erridge  Dr Sharon Peoples

Telephone: Secretary 0131 537 3266

Therapy Radiographers – trained in the delivery of therapeutic X-rays

Joanna Henderson  John Burton

Telephone 0131 537 3744 (LA7)  Email: SRSRad@nhslothian.scot.nhs.uk

Medical Physicists – trained in the planning and quality assurance of therapeutic X-rays

Linda Carruthers  Barry O’Connell

Neuro-Radiologists – doctors trained in the imaging of brain lesions

Dr Rod Gibson  Dr David Summers  Dr Susan Kealey

Neurologist – doctor trained in the medicine of brain and nerve disorders

Dr Robin Grant

Neuro-surgeon – doctor trained in brain and spine surgery

Professor Ian Whittle  Mr Michael Fitzpatrick  Mr Ioannis Fouyas
Miss Lynn Myles  Mr Jerard Ross  Mr Patrick Statham