Southern District Health Board

Southern Blood and Cancer Service, Dunedin Hospital

Stereotactic Radiotherapy (General)

This patient information booklet is designed to help you and your family gain a better understanding of Stereotactic Radiotherapy and its effects. We hope that it will be of benefit. If you have any queries, please do not hesitate to contact us.

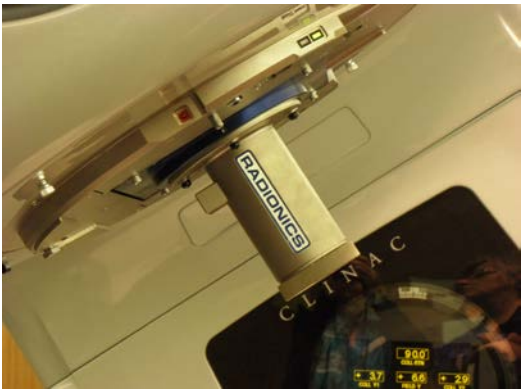
What is Stereotactic Radiotherapy?

Stereotactic Radiotherapy (SRT) is a non-surgical procedure that is designed to treat small abnormal lesions in the brain.
SRT treatment may be the recommended treatment or an alternative to surgery:

- For patients who are not surgical candidates due to co morbidities, the location of the lesion or other medical conditions
- To improve and enhance surgical outcomes
- If patients do not want invasive surgery

The procedure uses precisely-targeted radiation beams directed at the lesion from a number of different angles. The beams intersect in the lesion.
A relocatable headframe needs to be made (to stop your head from moving) so we can accurately locate the lesion and deliver the treatment with precision.
This means that a high dose of radiation can be given to the abnormal tissue in the brain whilst the dose to the surrounding area can be kept to a minimum.

In Dunedin we use a Linear Accelerator (LINAC) for the procedure. The part of the LINAC that rotates while delivering the treatment is called the gantry.
Attached to the gantry is a cylindrical device that can house cones that narrow the radiation beam so it fits the size of the lesion.



The LINAC attachment

Risk of complications and side effects

You are unlikely to feel unwell during or after the treatment and you can continue with your normal activities.
However, there is a small risk of side effects. Side effects of radiation treatment occur as a result of the treatment of the lesion as well as from radiation damage to healthy cells within the treatment area.

Radiation therapy may cause early side effects during or shortly after treatment. These side effects are normally well managed with medication. Depending on the location of the lesion within your head, **early side effects** may include:

- Tiredness
- Headaches
- Nausea and vomiting
- Swelling (oedema) of the lesion

Late side effects, which are rare, occur months or years following treatment. Long term side effects occur in about 3-5% of patients as a result of the treatment. They can include:

- Hair loss in the treatment area if the lesion is close to the skull
- Swelling (oedema) of the treated area

- On rare occasions necrotic or dead tissue that can cause further problems and may require removal
- Other side effects, that depend on the functions of the brain immediately surrounding the lesion and the dose of radiation received

The referral process

Our Stereotactic Radiosurgery Service receives referrals from throughout New Zealand.
Once a referral is received your case will be discussed at the monthly Stereotactic Radiosurgery referral meeting. This multidisciplinary meeting is attended by a team of Radiation Oncologists, Neurosurgeons, Neuroradiologists and Radiation Therapists.

A letter with the recommended treatment will be sent to your Specialist and General Practitioner.
You will be contacted by a Stereotactic Radiation Therapist if you have been accepted for treatment. This normally happens about 3 to 4 weeks before your appointment date.
The referral meetings are held on the third Tuesday of the month.

How to get to Dunedin and where to stay?

After you have been contacted with a date for treatment, the Radiation Therapist will contact the Travel Coordinator at your local hospital. The Travel Coordinator will then get in contact with you to arrange the flights and accommodation. You can have a support person accompany you if you wish.
The Ministry of Health (MOH) funds the transport for you and your support person.

You will have to make your own way to the airport from which you are leaving. However, the transfer to and from the airport in Dunedin will be paid for by the Ministry of Health (MOH). The MOH funds your accommodation in Dunedin up to a maximum of $100 per night.

You will be required to pay the extra if your accommodation costs more than $100 per night.

Who will be involved in your treatment?

The Stereotactic Radiosurgery Service consists of the following team members:
Radiation Oncologist
Neurosurgeon
Neuroradiologist
House Surgeon (Junior Doctor)
Radiation Therapists
Medical Radiation Technologist (Radiographer)
Registered Nurse
Medical Physicist
Physics Technician

Planning appointments

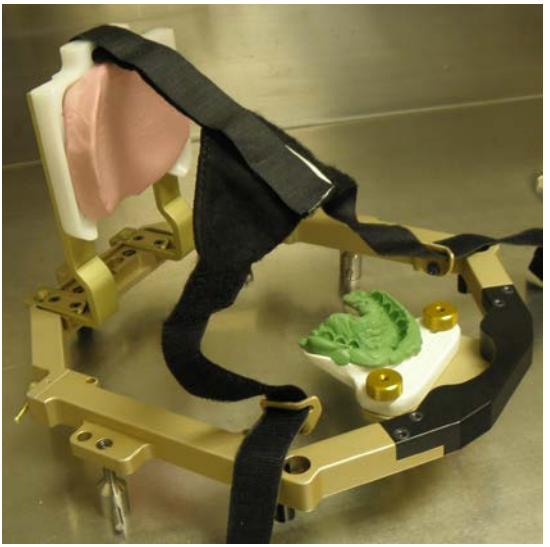
You will be required to come to Dunedin for one to two days for treatment planning appointments.
You can return home afterwards, as the treatment will start one to two weeks after your planning appointments.

During your initial appointments you will be seen by the Radiation Oncologist. They will explain the procedure and make sure that you understand the treatment and the potential side effects.
It is helpful to write down any questions you have before you come to Dunedin.
You should ask the Radiation Oncologist about taking your regular medications and bring all medications with you to your appointments.

The Radiation Therapist will make a relocatable headframe that is needed for the treatment. You may also have an MRI scan to help us plan your treatment. The Radiation Oncologist will decide beforehand if an MRI is needed.

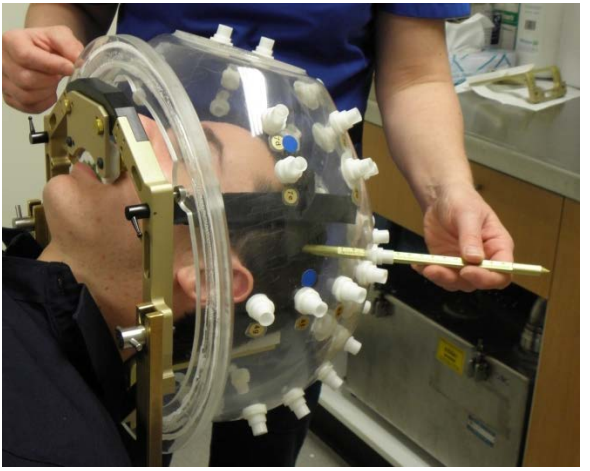
Making the relocatable headframe

The Radiation Therapist will make the headframe. The frame is used during the CT scan and all the treatments.
Making the frame involves taking an impression of your teeth/gums and of the curve on the back of your head.
These impressions are then attached to the frame which has straps to hold the frame in place on your head.
The frame needs to fit well as we need it to relocate into the same position each time it is used.



The relocatable headframe

The frame's position is checked by taking a series of measurements using a depth helmet. We measure the distance from the depth helmet to your scalp so that the exact location of your head is known with reference to the headframe.



Taking depth helmet measurements

CT scan

A CT scan is needed to locate the lesion and get the information required to plan your treatment.

First you will need a cannula in your arm to be able to give you the dye (contrast) that is needed for the CT scan.

Once you lie on the couch with the headframe fitted, we repeat the depth helmet measurements.
The measurements are repeated daily before we start your treatment to make sure the relocatable headframe is in the same position as it was at the CT scan.

A localiser frame will be attached to the headframe. *The rods on the localiser frame show up on the CT images. It enables us to locate the lesion in our Stereotactic Radiotherapy planning system, by transferring the two-dimensional (2D) CT information into a three-dimensional (3D) coordinate.*

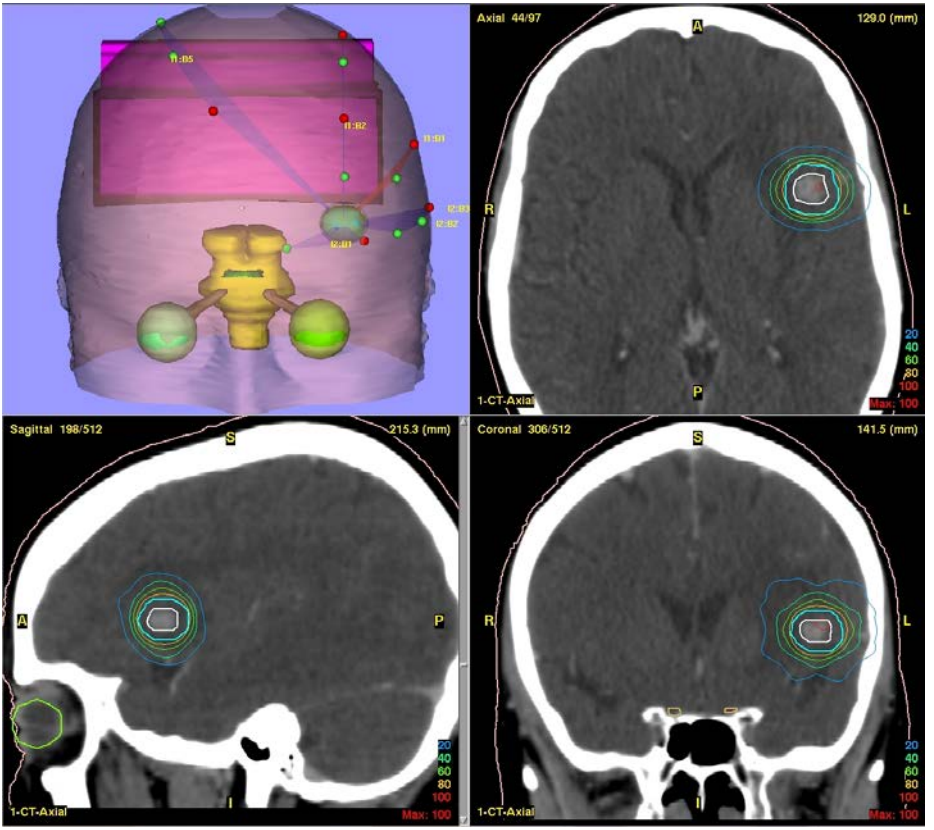
Localiser frame

The Radiation Therapist will now connect the pump with the dye to the cannula in your arm.
Then we can start the CT scan.

You may find the dye makes you feel warm and flushed. This is a completely normal reaction which will only last a minute or two.

Treatment planning

With your imaging done, we can now start with the computerised planning process.
The lesion will be outlined on the CT images.
The Radiation Therapist will then plan the treatment.
Different radiation field angles and the correct cone size are chosen to give the best radiation dose coverage of the lesion.
The dose is the amount of radiation prescribed by the Radiation Oncologist.
The radiation dose cover can be visualised as a 2 Dimensional (2D) dose lines or 3 Dimensional (3D) dose cloud on the planning system.



3D & 2D dose Views

The Radiation Oncologist will check the plan. They will make sure that the radiation dose to the critical structures in your brain will be kept as low as possible.
The plan will then be checked by a second Radiation Therapist and a Medical Physicist.

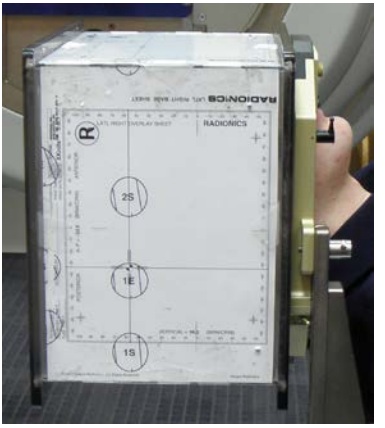
The treatment

The Radiation Oncologist will decide how many treatments you will need.
The number of treatments you need depends on the type of lesion, the size and its location. The number of treatments can range from 5 to 30.

You will receive treatment once a day, Monday to Friday. There is no treatment at the weekend.
Your first treatment appointment will take 45 minutes, with the following treatments taking approximately 30 minutes.

You will have a moment to familiarise yourself with the Radiation Therapists' involved in your treatment and the treatment area when you come in for your first treatment.

The headframe is fitted and the depth helmet measurements will be taken.
Once you are in the correct treatment position, a target localiser box is used to align your head with the planned treatment center by moving the couch that you are lying on.
It is important that you keep very still during the set up and the treatment.



Target Localiser Box

You will be in the treatment room by yourself during the treatment. However, you will be watched all the time on TV monitors. There is also an intercom system so we can hear you and talk to you if needed.

The treatment fields are delivered separately from different directions. You will be lying still; the treatment machine and/or treatment couch will move.

The Radiation Therapist will come into the room when the couch needs to be moved (rotated) in between the treatment fields.
The LINAC makes a "humming" sound when it delivers the treatment.
You won't feel anything during the delivery of the treatment.

Follow up

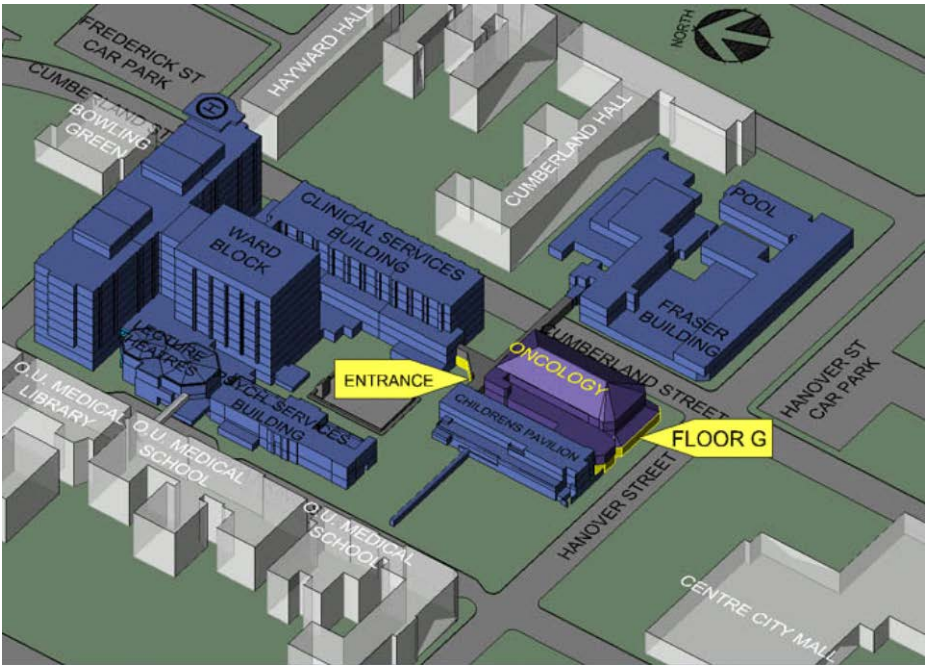
While you are on treatment with us you will be seen once a week by an oncology nurse. Once you finish your treatment you can return home.

Your ongoing care will be provided by the Specialist who referred you to the Service. A letter with the SRT treatment details will be sent to your referring Specialist and to your GP.

Useful phone numbers

Stereotactic Radiosurgery Service 03 470 9511
Email: Stereotacticradiosurgery.service@southerndhb.govt.nz

Cass Stornoway - Oncology Social Worker 027 434 4365
Email: Cassandra.Stornoway@southerndhb.govt.nz



The Oncology building can be entered from either Cumberland St or Great King St.

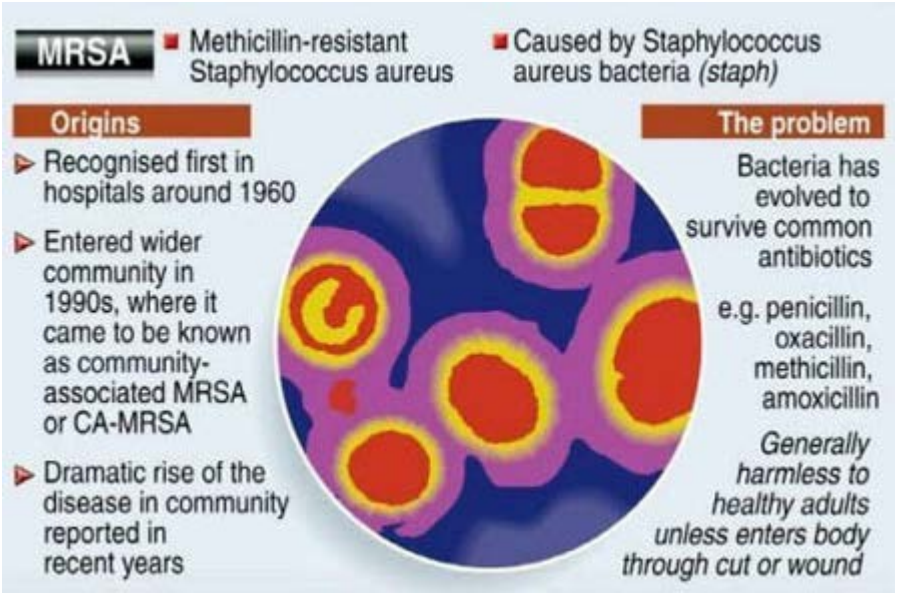
If entering from **Cumberland Street** turn left as you go under the building to the car park and take the lift up to the ground floor.

If entering from **Great King Street** then walk up the concourse towards the emergency department and enter the red sliding doors opposite the ward block and emergency department.

MRSA (Methicillin Resistant Staphylococcus Aureus)

Our hospital has a policy of screening patients for MRSA if they have attended a NZ medical facility within 6 months of their visit or an overseas hospital within the last 2 years.

MRSA is a germ that like many others can cause an infection. It is resistant to most antibiotics. The bacteria lives on your skin.
Many healthy people carry MRSA but it can cause an infection in those with weakened defenses.
MRSA is hard to stamp out once it is present. People can "carry" this germ for a long time. People who have prolonged or repeated hospital stays are more at risk of getting MRSA.



If you require the test, we will send you a laboratory request form. The skin swabs can be done by your Practice Nurse or at your local Laboratory.

Notes/Questions