



Information for Patients Receiving Stereotactic Ablative Radiation Therapy to the Lung

This information sheet has been written to provide answers to some questions you may have about stereotactic radiation therapy treatment at Auckland Radiation Oncology (ARO).

The following topics will be discussed:

- What is SABR/SBRT?
- Auckland Radiation Oncology Team
- Treatment Planning Appointment & CT
- Treatment Delivery and Doctor Appointments
- Potential Side Effects
- Follow-up Arrangements

ARO TREATMENT TEAM

Your radiation treatment will be given at Auckland Radiation Oncology located on the Mercy Hospital campus in Epsom. ARO is a partnership between MercyAscot and Southern Cross Hospitals. You will meet various members of the ARO team during your visits. The following is a brief description of who we are and what we do.

Radiation Oncologist: A specialist doctor who is qualified in the treatment of cancer with radiation.

Radiation Therapists: Qualified technical professionals involved in the planning and operation of the radiation equipment during your treatment.

Medical Physicist: A scientific officer who performs regular checks to ensure the safety of radiation equipment and treatment plans.

Registered Nurse: A nurse whom has advanced knowledge of caring for cancer patients. The nurses, along with the radiation therapists, will advise you on how to look after yourself while you are on treatment.

Receptionist/Scheduler: These people will help you with scheduling your appointments, and will be able to discuss your account details.

Engineer: This is a person whom has been trained on the operation and maintenance of the equipment.

As this is also a training facility, there may be students involved in your treatment. You have the right to ask that students not be present during your procedures.

We aim to give you the best possible care during your treatment, so if there is anything else you need to know, please ask any one of us at ARO.

WHAT IS STEREOTACTIC BODY RADIATION THERAPY (SBRT) OR STEREOTACTIC ABLATIVE RADIATION THERAPY (SABR)?

Radiation therapy works by damaging tumour cells causing them to die off and to stop them from spreading. The aim is to deliver doses of radiation that will destroy the tumour and achieve local control.

Stereotactic Body Radiation Therapy (SBRT) has been more recently and appropriately named Stereotactic Ablative Radiation Therapy (SABR). This is a non-invasive procedure that delivers precisely targeted radiation at very high doses, in only a single or few treatments (or fractions), as compared to conventional radiation therapy. No incision is made, minimizing the chance of infection or excessive bleeding and general anaesthesia is not required for adults. SABR is therefore an important alternative to surgery, especially for patients unable to undergo surgery and for tumours or malignancies that are hard to reach.

SABR directs beams from more angles than other types of radiation therapy, so the treatment can target the tumour very precisely. Advances in imaging and highly accurate radiation delivery have made possible the safe delivery of radiation doses that truly can remove or destroy tumour tissue, which has revolutionised radiation therapy for early stage lung cancer. SABR can also be used to treat secondary cancers (cancer that started in another part of the body) in the lung, spine, liver and other sites.



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Each of the individual beams gives a small dose of radiation therapy. Because all of the beams meet at the tumour, the cancer cells get the full dose. A team of Radiation Therapists plan the treatment so that each beam is aimed very precisely. This allows delivery of a very high dose of radiation to the tumour but at a much lower dose to the surrounding normal tissues.

The benefit of having SABR is that it can be completed in fewer treatment sessions than conventional radiation therapy, depending on the type and location of cancer being treated. There is also the potential for better local control because an ablative dose is delivered with precision using image guidance.

Three-dimensional scans, such as CT, MRI, and PET-CT are used to locate the malignant tissue within the body and define its exact size and shape. These images will determine the treatment planning as well as allow for careful patient positioning for all treatment sessions.

TREATMENT PLANNING & CT

In order to deliver the treatment accurately and at the correct dose, we need to be able to locate the exact area to be treated in relation to the surrounding normal tissues. This process is called treatment planning.

The planning process will require you to have a CT scan. Small permanent tattoo marks will be made on your skin to assist in the daily set-up for treatment. Using the information obtained during planning we calculate the best method of giving a dose of radiation to the treatment area, whilst avoiding as much normal tissue as possible. The treatment beam can be delivered from several different directions in relation to the area to be treated.

After your scan, you will have the opportunity to view your treatment plan with a member of your treatment team.

The planning session is the most important part of your treatment and may take up to 2 hours, due to the precise and careful nature of the process.

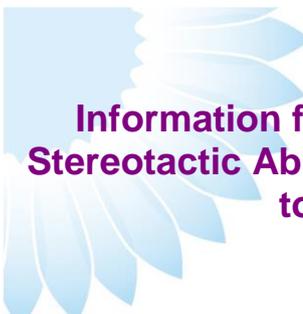
TREATMENT DELIVERY

After the treatment planning appointment, time is required to complete the planning and calculations for your treatment. Treatment is started as soon as possible following the completion of this process.

At Auckland Radiation Oncology you will receive this treatment on one of our Linear Accelerators (LINACs) which has been specially designed to deliver SABR. Treatment course usually consists of a few treatments (fractions) over 1-2 weeks; your oncologist will discuss with you the exact treatment prescription as this can vary depending on tumour characteristics and location. Each treatment (fraction) generally takes 30-60 minutes to complete. Every effort is made to treat you within your scheduled time, but sometimes delays may be unavoidable.

You will be required to come in to ARO for an appointment before your treatment begins to have a practice run through of the treatment. This will involve a team of Radiation Therapists, Radiation Physicists as well as your Radiation Oncologist. Depending on the complexity of your treatment, this can take 30 minutes to an hour to complete. A series of X-ray images (CBCT) and measurements will be taken to ensure your treatment will proceed smoothly.

On treatment you will be required to lie in the same position as during the CT scanning, and we ask that you try to keep as still as possible during the procedure. During your treatment it is best if you relax, breathe normally, and allow the radiation therapists to move you as necessary. A CBCT will be taken before your treatment every day to verify your position, and allows your treatment team to make necessary adjustments to ensure the accuracy of your



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treatment. Part of the LINAC (called a gantry) will then rotate around you to deliver the beams of radiation from different angles.

The radiation therapists must leave the room during the treatment; however they monitor you on a camera from outside the room. There is also an intercom system, so call out or give an indication if you need assistance.

You are welcome to bring support people with you when you come for appointments. At a convenient time your support person may accompany you into the room to see the machine, but will be asked to return to the waiting room before the therapists begin positioning you for your treatment.

When scheduling appointment times, effort is made to accommodate you in regards to work, travel times and your other commitments, but unfortunately this is not always possible. You will receive a copy of your complete schedule on the first day of attendance. We advise you to check these times against your calendar and let us know where there are areas of conflict. We will do our best to change your scheduled times to meet your needs. The more notice you can give us, the more likely we are to be able to assist you with this.

DOCTOR APPOINTMENTS

You will see your oncologist for review while you are on treatment. Clinic days and times are specific to each doctor and every effort will be made for these times to coincide with your treatment times.

Please feel free to speak to the therapists about any questions, concerns or problems you may have; it is not necessary to wait for your visit with the doctor. If the therapists feel you need further, immediate management, they will have you seen by a nurse and/or doctor.

POTENTIAL SIDE EFFECTS

As stated previously, the x-rays used in radiation therapy can damage the DNA (genetic code) of cells. The radiation also affects the normal tissues of the body, and this can cause side effects. However, we know that normal tissues are better able than cancer cells to heal from the radiation damage, and most of the normal tissues will recover.

While SABR in general has fewer side effects than conventional radiation therapy, as less healthy tissue is exposed to radiation, some side effects can still occur and can be categorised as Acute (short term) or Chronic (long term) side effects. The number and severity of side effects from radiation therapy will depend on the dosage you receive as well as on the part of your body being treated. Some of the potential side effects are only applicable to specific tumour locations and your oncologist will discuss these with you in detail during the consultation if applicable. You should speak to your ARO Radiation Oncologist or a patient care specialist about any side effects you may be experiencing so that they can help you to manage them.

Acute Side Effects (Short Term/Early)

These are side effects that occur *during* the treatment course and usually take a few weeks to resolve after completion of treatment. At the beginning of the course you may notice little change. The acute side effects may appear at about half way through your treatment course and then become increasingly apparent toward the end.

Please speak to your treatment team if any of the following reactions occur so that these can be managed.



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Fatigue

General tiredness may occur during and after the treatment course. Some people may still be able to work and only take time off for the daily appointment, but others may find it too tiring and prefer to stay at home.

Advice to help combat fatigue includes:

- Keep well hydrated - The recommended consumption is 1.5-2.5L of fluid per day. Limit those with caffeine (eg coffee, tea and cola) as this is a diuretic and will actually make you lose fluid you have drunk throughout the day.
- Perform some gentle exercise, such as a 30 minute walk several times a week. However, it is important that you listen to your body and do not over exert yourself.
- Getting plenty of rest each day helps the normal body tissues to recover on a daily basis from the effects of the radiation therapy.

If the problem becomes severe, please inform a member of the treatment team.

Skin Reddening and Irritation

The timing of the skin changes depends on the course of treatment prescribed. Your skin, in the treatment area may become red, dry, or itchy throughout the treatment course. On rare occasions these skin changes can be chronic, your oncologist will discuss this with you if this apply to you.

The team at Auckland Radiation Oncology understands that being treated for cancer can be frightening at times, and we are committed to making your time with us as comfortable and stress-free as possible. If you have concerns about your treatment or any side-effects, please do not hesitate to talk to the ARO patient care specialists or your Radiation Oncologist.

The peak of any reactions/side effects you may experience will occur approximately 7-14 days after the completion of your radiation treatment. This is due to the cumulative nature of the treatment.

Late Side Effects

Most people return to “normal” after completion of their treatment, but a few patients experience some long term side effects. These can develop gradually over several months or years. The changes that result may cause no clinical symptoms. With more advanced treatment techniques and individualised planning the risk of long term side effects are kept to a minimum. Your oncologist will discuss these with you before you start your treatment as part of the informed consent process.

Please speak to your radiation oncologist about these long term side effects if you are concerned.

Shortness of Breath

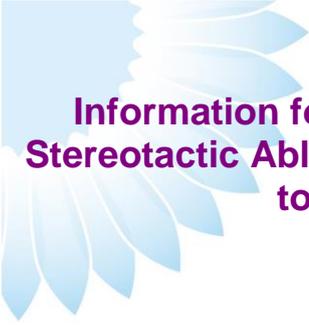
Sometimes radiation treatment can cause the lung tissue to become inflamed post treatment (Pneumonitis). This can result in symptoms of breathlessness, wheezing, and cough. This can occur within the first six months after treatment. Your RO will be able to prescribe you medications to assist with symptoms if this occurs.

Chest Pain

If the area being treated is close to the chest wall, you may experience pain following SABR. It is usually mild, and can be resolved with painkillers such as paracetamol. If your pain is more severe, please discuss with your treatment team.

Lung scarring/collapse

Occasionally a small part of the lung may collapse. If this occurs, it can cause shortness of breath.



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Chest wall pain/rib fractures

If the tumour is situated close to the chest wall, there is a small chance that it can cause the ribs to weaken, resulting in pain and rib fractures. This does not cause symptoms in some patients, but some may require pain medication.

Radiation induced cancers

These are exceptionally rare (less than 1%).

FOLLOW-UP ARRANGEMENTS

At the completion of treatment, you will be instructed how to arrange an appointment or one will be made for you to have a follow-up visit with your oncologist. The interval between finishing treatment and this appointment varies depending on the area you are having treated.