



Information for Patients Receiving Radiation Therapy to the Thorax

THORACIC RADIATION

Thoracic radiation may be recommended for the treatment of various types of cancers occurring in the chest cavity.

This information sheet has been written to provide answers to some questions you may have about External Beam Radiation Therapy to the thorax.

WHAT IS RADIATION THERAPY?

Radiation therapy is a treatment in which an x-ray beam, coming out of a machine called a linear accelerator, is aimed specifically at the site of the cancer. The x-rays damage the DNA (genetic code) in the cancer cells, and this damage then results in the death of the cancer cells. Radiation therapy is planned to treat as little of the normal body as possible. You do not feel the radiation as it is being delivered.

Treatments are usually extended over a period of weeks, which allows the normal cells to recover between successive treatments. Depending on the type of cancer and the intent of treatment (curative vs symptom relief), treatment prescriptions may vary from a single fraction up to 7 weeks. On the whole, almost everyone is treated as an outpatient.

ARO TREATMENT TEAM

Your radiation treatment will be given at Auckland Radiation Oncology (ARO) located on the Mercy Hospital campus, 98 Mountain Road in Epsom. ARO is a partnership between MercyAscot and Southern Cross Hospitals. You will meet various members of the team at ARO 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 by radiation

Radiation Therapists - qualified technical professionals involved in the planning, scheduling and operation of the radiation equipment in your daily treatment.

Medical Physicist - a scientific officer who performs regular checks to ensure the safety of radiation equipment and treatment plans. The physicist also makes certain that all radiation safety guidelines are implemented and followed.

Registered Nurse - a nurse that has completed their training and has advance knowledge of caring for cancer patients. They will look after you during your visits to ARO. 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 that has 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.

The therapists, nurses and students work under the direction of your radiation oncologist.

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.



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TREATMENT PLANNING & CT

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

The planning process may require you to have a CT scan of the thorax. Small permanent tattoo marks will be made on your skin to assist in the daily set-up for treatment. Using the information obtained during CT, a “target volume” is determined by your oncologist on a computer planning system. We calculate the best method of giving a dose of radiation to the target volume, whilst avoiding as much normal tissue as possible.

Measurements are recorded and checked routinely throughout the course of treatment to ensure the treatment is accurately delivered. The treatment beam can be delivered from many different directions in relation to the thorax.

TREATMENT DELIVERY

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

Treatment is usually given once a day, five times per week, with the exception of public holidays. You will spend about 10-30 minutes in the treatment room where the linear accelerator is housed. Plan to spend 30-60 minutes within the centre each day.

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 treatment. 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.

You will be required to lie in the same position as during the planning process, and we ask that you try to keep as still as possible during the procedures. Your daily treatment requires specific positioning, so it is best if you relax, breathe normally, and allow the therapists to move you as necessary. Once the therapists have positioned you correctly, you will be required to keep still until the treatment is completed.

The 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 if you needed assistance, call out or give an indication.

The direction of the beam is set by moving the machine and the table on which you will be resting, to the correct position. Each day an electronic image is captured from the x-ray beam and assessed for accuracy. Some days, adjustments to the bed position will be made before continuing with the treatment.

You are welcome to bring support persons with you when you come for appointments. They may accompany you into the room, but will be asked to return to the waiting room before the therapists begin positioning you for treatment.

DOCTOR CLINICS

You will see your oncologist in a review clinic 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.



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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 the radiation damage, and most of the normal tissues will recover.

With improvements in technology, including modern planning systems and treatment delivery methods, the side effects of External Beam Radiation Therapy have been reduced remarkably. However, some people may be affected to some extent and the severity of the side effects varies from person to person. There can be “acute” (short term) or “chronic” (long term) side effects.

You will not necessarily be at risk of all the side effects described in this booklet (e.g. if your heart is not in the radiation field you will not have any cardiac side effects).

Please be re-assured that most severe side-effects are rare. Please discuss any particular concern you have with your treating Oncologist.

Acute Side Effects (Short Term)

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, except perhaps, some tiredness. At about half way through and then increasing toward the end, the acute side effects may appear.

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. Also, you may be more emotional than usual and wish to call on family and friends to help during this time.

Usually an afternoon sleep and an earlier bedtime will solve the problem. Mild exercise e.g. walking has also been shown to be of benefit. In general we suggest you keep to your normal routine until your body tells you otherwise. If the problem persists or becomes severe, please inform a member of the treatment team.

Skin reddening and irritation within the treatment area

The timing of the skin changes depends on the course of treatment prescribed, but commonly slight reddening occurs by the second or third week of treatment. The skin becomes increasingly red towards the end of treatment, with the peak of the reaction occurring 7-14 days after the completion of treatment. Please let your treatment team know if you experience any of these problems. We will provide advice and prescribe medication as necessary. Please do not use any creams or ointments on your skin unless recommended by your treatment team.

Aches and pains

These are often described as ‘stabbing’ or ‘shooting’. Most patients feel minor twinges and do not require any pain medication.

Hair loss

This may occur within the treatment field only, and may be permanent.

Tracheitis, bronchitis, pneumonitis (inflammation of the airways)

This may become noticeable during or shortly after your radiation course. It may result in an increased cough, sometimes with greater sputum production or blood streaking. Usually it is of no consequence and



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will settle a few weeks after completing radiation. If your sputum becomes red, brown or green tell your doctor, as you may need antibiotics.

Oesophagitis (inflammation of your gullet)

This results in increased sensitivity as food passes through the inflamed part of your oesophagus. It usually starts after 2-3 weeks of treatment and will reach a peak by week 5-6. It can be very severe, preventing any food or liquids from being taken and could require morphine for the pain.

Some patients may need supplemental feeding through a tube placed directly through the skin into the stomach. This is called a PEG tube. Your doctor will explain this in greater detail should you require one.

For most people the oesophagitis will settle between 2-6 weeks after the completion of treatment and one's diet should return to normal. Significant oesophagitis affects 1 in 4 patients who have high dose radiation to the chest.

Chronic Side Effects (Long Term)

Most people return to 'normal' after completion of their treatment, but a few may experience some long-term side effects. Chronic side effects may arise many months or even years *after* the completion of radiation therapy. These side effects relate to the 'scarring' effects of the radiation therapy on normal tissues within the area of treatment.

Skin changes

The skin within the treatment field may appear darker (tanned) for a while. *Telangiectasia* may develop. These are tiny blood vessels under the skin that may become swollen. These can be unsightly but do not require treatment.

Pneumonitis (inflammation of the lung): This may present as a cough and shortness of breath 6 weeks - 6 months after the completion of radiation therapy. Pneumonitis can be treated with prescription medications and will settle.

Oesophageal Stricture (narrowing) can occur due to scarring in the wall of the oesophagus. This is a rare complication.

Tracheal or bronchial strictures can also occur rarely.

Lung fibrosis (scarring) can occur and is usually permanent. This may result in a reduction in your breathing capacity (usually an approximate 10-15% reduction).

There is a small risk **of damage to the heart vessels and muscle** in the long term. The lining of the heart may become inflamed after radiation, again this is rare and is less likely to happen greater than 3 months after completing radiation.

There is a small risk of developing **rib fractures** due to the weakening of these bones after radiation.

There is an extremely small risk of **damage to nerves or spinal cord** in the long term.



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There is a theoretical risk of developing **second cancers**, usually many years after radiation. This is again an extremely rare side effect (<1/1000).

FOLLOW-UP ARRANGEMENTS

At the completion of your treatment, an appointment 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.

CLINICAL RESEARCH

Medical professionals at Auckland Radiation Oncology study the nature of disease and try to develop better methods of diagnosis and treatment. This is called clinical research. We are committed to clinical research with the expectation that we will ultimately improve patient care patient outcomes. In the discussion of your treatment, your doctor may invite you to participate in clinical research.

We are constantly looking for ways to improve our cure rates. Some of the features of your cancer may make you eligible to participate in a clinical study. If you are interested and eligible, these trials will be discussed with you in detail.