



Radiation Treatment Haumanu Iraruke



Understanding Cancer

A guide for people having radiation treatment

ANY CANCER, ANY QUESTION

0800 CANCER (226 237)

Cancer Information Helpline

Your general practitioner: phone _____

Your nurse: phone _____

Your local Cancer Society phone: _____

24-hour emergency: phone 111

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Publications statement

Our aim is to provide easy-to-understand and accurate information on cancer and its treatments. Our Living with Cancer information booklets are reviewed and updated by cancer doctors, specialist nurses and other relevant health professionals to ensure that the information is reliable, evidence based and up to date. The booklets are also reviewed by consumers to ensure they meet the needs of people with cancer and their carers.

Other titles from the Cancer Society of New Zealand/Te Kāhui Matepukupuku o Aotearoa

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Brochures

Being Active When You Have Cancer

Questions You May Wish to Ask

Cancer Society information and support services

The Cancer Information Service is a Cancer Society phone line where you can talk about your concerns and needs with specially trained health professionals. Phone the Cancer Society Information Helpline **0800 CANCER (226 237)**.

Your local Cancer Society offers a range of services for people with cancer and their families/whānau. These may include:

- information and support
- volunteer drivers providing transport to treatment
- accommodation while you are having treatment away from home.

The range of services offered differs in each region, so contact your local Cancer Society to find out what is available in your area.

“*When I was diagnosed I was very frightened and vulnerable to misinformation and suggestion by well-meaning people. I wanted, and mostly got, information and positive encouragement, which gave me hope.” Phil*

Questions you may wish to ask your doctor

When you first learn you have cancer you may have many questions. We suggest you think about the questions you would like to have answered and what you do not want to be told before you visit your cancer doctor. You may want to have a support person with you when you visit. Here is a list of questions you may wish to ask.

- What are the advantages and disadvantages of radiation treatment for me?
- Are there any other treatments I can have instead?
- Will radiation treatment cure me or keep my cancer under control?
- What difference would it make if I waited?
- Can I have a second opinion?
- Can I have radiation treatment at my local hospital or will I have to travel?
- If I need to travel away from home for my treatment appointments, what financial support and accommodation are available?
- How long will my treatment last and how often will I have to have it?
- Will I have to stay in hospital?
- Which part of my body will be treated?
- How long will each treatment take?
- Will I be able to carry on with my normal life when I am not at the hospital?
- If I can have the treatment privately, how much will it cost?
- What side effects can I expect?
- Can the side effects be managed?
- How long after my treatment ends will it take for the side effects to go?

Will there be any permanent side effects?

- Will I still be able to have children?
- Should I keep taking my usual medicines?
- Do I need a special diet?
- What is the waiting list for this treatment?
- If I have to wait to have treatment, will it affect my health?
- Will the treatment affect my sex life?

“I wasn't ready to hear much and I'd let them know when I wanted more information.” Syd

If there are answers you do not understand, it is okay to say, for example:

- would you explain that again please?
- I am not sure what you mean by...?
- would you draw a picture, or write it down please?

Visit the Cancer Society's website www.cancernz.org.nz for more information about specific types of cancer and treatments, or call the Cancer Information Helpline **0800 CANCER (226 237)**.

About this booklet

This booklet has been written to support you during radiation treatment (sometimes called radiotherapy or radiation therapy). It provides information about treatment, practical support and the emotional impacts of cancer. We cannot tell you which treatment is best for you. You need to discuss this with your own doctors and family/whānau. However, we hope this information will answer some of your questions and help you to think about the questions you may want to ask your doctors.

The booklet is divided into sections:

- Section one explains what radiation treatment is.
- Section two covers the side effects of treatment.
- Section three is about making treatment decisions.
- Section four talks about looking after yourself during treatment and beyond.

Information is summed up in key points at the end of each section. We have translated our key points into te reo Māori.

For those who want more in-depth information about radiation treatment, we have included a section on the technology involved in radiation treatment in the appendix (page xx).

Ngā kōrero mō te pukapuka nei

I tuhia tēnei pukapuka hei āwhina i a koe i te wā e whai ana koe i te maimoatanga iraruke (kīia ai ko te haumanu iraruke i ētahi wā). Kei roto, ko ngā kōrero e pā ana ki te maimoatanga, ki ngā āwhina whaitake me ngā papātanga ā-ngākau o te matepukupuku. Kāore mātou e āhei ana ki te kī atu ko tēhea te maimoatanga pai rawa mōu. Me kōrero kē koe i ēnei i te taha i tō rata me te whānau hoki. Heoi anō, ko te tūmanako, ka whakautu ēnei pārongo i ētahi o ōu pātai, me te āwhina i a koe ki te whakaaroaro i ētahi pātai tērā pea ka hiahia koe ki te whiu ki o rata.

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Section one: About radiation treatment



What is radiation treatment?

Radiation treatment is the use of radiation beams to destroy cancer cells or stop them growing. Radiation treatment only affects the part of the body at which the beams are aimed. About half of all people with cancer need radiation treatment at some point. For some types of cancer this is the main treatment. It might also be used in combination with surgery, chemotherapy or hormone therapy.

He aha te maimoatanga iraruke?

Ko te whakamahi i ngā hihi iraruke ki te patu i ngā pūtau matepukupuku te mahi a te maimoatanga iraruke, ki te whakamutu rānei i tō rātou tipu. Ka whai pānga anake te maimoatanga iraruke ki te wāhi o te tinana ka tuhia ngā hihi. Awhiawhi ki te hāwhe o ngā tangata mate i te matepukupuku ka whai i te maimoatanga. Mō ētahi o ngā matepukupuku koina tonu te maimoa matua. Whakamahia ai i ētahi wā ki te taha o te hāparapara, te hahau, te haumanu taiaki.

Why is radiation treatment used?

- To cure cancers, often in addition to other treatment.
- To shrink a tumour so that surgery is more effective - neoadjuvant radiation treatment.
- To treat any cancer cells remaining after surgery - adjuvant radiation treatment.
- To slow the growth of cancer or relieve symptoms such as bone pain - palliative treatment.

He aha te take whakamahia ai te maimoatanga iraruke?

- Hei whakaora matepukupuku, he nui tonu ngā wā ka tāpiria ki ētahi atu maimoatanga.
- Hei tīngongo i tētahi pukupuku kia whai kiko pai ake ai te mahi hāparapara - neoadjuvant maimoatanga iraruke.
- Hei patu i ngā pūtau matepukupuku e mau tonu ana whai muri i te hāparapara - adjuvant maimoatanga iraruke.
- Hei whakatōmuri i te tipu o te matepukupuku, hei whakahirihiri tohumate rānei, pērā ki te mamae o te kōiwi - maimoatanga taurima.

How does radiation treatment work?

Radiation treatment destroys cancer cells that are dividing. It also affects dividing cells of normal tissue. The damage to normal cells is what causes side effects. For each person receiving radiation treatment, a decision is made about how much treatment to give without causing too much damage to normal tissue. Normal cells can repair themselves after this damage, but cancer cells cannot.

What are the ways of giving radiation treatment?

There are two ways of giving radiation treatment:

- **External beam radiation treatment** - this is given from outside the body (see page 13).
- **Internal radiation treatment** - this is given using a radioactive source placed inside the body (see page 20).

The way you have radiation treatment depends on the type of cancer you have and where the cancer is in your body. Some cancers are treated with both external and internal radiation.



Will radiation treatment make me radioactive?

This is a common question, and the answer will depend on the type of treatment you are having.

External radiation treatment does not make you radioactive. It is safe to be with your children, family/whānau and friends both throughout the treatment and after the treatment has been completed.

Internal radiation treatment can be given in two ways:

1. **Temporary** - a radioactive source is placed inside your body and then removed. You will only be radioactive when the source is present in your body. This is all done in hospital.
2. **Permanent** - a radioactive source is placed inside your body and not removed. You will be radioactive for a short time. There will be no outward appearance that you are radioactive, but it is important to follow any safety instructions given to you. This will ensure that your family/whānau and friends are not exposed to radiation.

Ka noho ira rukeruke au nā runga i te maimoatanga iraruke?

He nui ngā wā puta ai tēnei pātai, ā, ka hāngai te whakautu ki te momo maimoa kei te whai koe.

Kīhai koe e noho ira rukeruke nā runga i te maimoatanga iraruke ā-waho. He pai noa iho ki te noho me o tamariki, tō whanau, me ngā hoa hoki i te wā o te maimoatanga, whai muri hoki i te maimoatanga.

Ka āhei te hoatu i te maimoatanga iraruke ā-roto ma ngā huarahi e rua:

1. **Rangitahi** - ka raua he pū ira-rukeruke ki roto i tō tinana ā, katahi ka tangohia. Ka noho anake te ira-rukeruke ki roto i a koe i te wā e noho ana te pū ira rukeruke i roto i tō tinana. Ka mahia katoa ēnei mahi i te hōhipera.
2. **Tūturu** - ka raua he pū ira rukeruke ki roto i tō tinana ā, kāre e tangohia. Ka noho ira rukeruke koe mō te wā poto. Kāre e kitea i tō tinana mehemea kei noho ira rukeruke koe engari, he mea nui kia whai koe i ngā tohutohu haumarua ka hoatuna ki a koe. Mā tēnei e whakarite, kia kore ai tō whanau me o hoa e noho mōrearea ki te iraruke.

Where will I have radiation treatment?

Radiation treatment is available in specialist treatment centres in Auckland, Hamilton, Tauranga, Palmerston North, Wellington, Christchurch and Dunedin.

Is there help available with transport and accommodation?

Help may be available for transport and accommodation costs if you are required to travel some distance to your medical and treatment

appointments. Your treatment centre or local Cancer Society can advise you on what sort of help is available, such as Cancer Society accommodation or National Travel Assistance.

Cancer Society accommodation

The Cancer Society provides accommodation for people having cancer treatment away from home. If you are interested in using this service, contact your local Cancer Society or the Cancer Information Helpline **0800 CANCER** (226 237) for more information. If you meet specific criteria there may be no cost to you for this accommodation.

“*It's like a home away from home. We do all our own cooking and washing. You still have to look after those things yourself. It's not like hospital. It's really good to meet people, talk about it, but you've got your own room and your own time.”* **Melinda**

National Travel Assistance

If eligible, you can get financial help towards your travel and accommodation costs. To find out if this applies to you, speak with a social worker or your hospital travel office. For more information, see the Ministry of Health website (www.health.govt.nz/new-zealand-health-system/claims-provider-payments-and-entitlements/national-travel-assistance) or phone 0800 281 222.

Who is involved in my care?

A team of health professionals will provide your treatment and care. The team may include a:

- **radiation oncologist** - specialises in the use of radiation to treat cancer. This doctor is responsible for your overall treatment
- **registrars and house surgeon** - doctors who are part of your medical team

- **medical physicist** - is responsible for ensuring the quality of radiation equipment, your treatment plan and the software used to deliver your treatment
- **radiation therapist** - plans and delivers your treatment. They specialise in the care of patients who are receiving radiation treatment
- **oncology nurse** - specialises in the care of patients with cancer
- **dietician** - gives nutritional advice to those who are affected by cancer and the side effects that treatment may cause
- **social worker** - helps to provide emotional and practical support to you and your carers
- **speech language therapist** - helps with your rehabilitation if cancer or treatment has affected your ability to talk or swallow. Students may be present at times during your radiation treatment, but only if that is okay with you.

“When I was having my treatment I used to ask a lot of questions, but staff were always happy to answer, even if I'd asked them before.” Garry

What happens when I have treatment?

This section explains what happens during radiation treatment with either external or internal radiation treatment.

External radiation treatment

The machine you are treated with will depend on the type of cancer you have and what part of your body is affected. For example, superficial therapy machines are better at treating cancers on or near the surface of the skin. Linear accelerators are used to treat cancers deeper in the body. See page 60 for more information about the types of treatment machine.

During treatment you will lie still and the machine will move around you so that the radiation can be directed at the tumour from different

The radiation therapist will explain your treatment to you.



angles. It is similar to having an X-ray taken. You will not see or feel anything during this treatment.

Maimoatanga iraruke ā-waho

Ka hāngai te mīhini ka whakamahia mōu ki te momo matepukupuku kua pā ki a koe, me te wāhi hoki o tō tinana kua pā taua matepukupuku. Hei taurira atu, he pai ake ngā mīhini haumanu kirimoko mō nga maimoa matepukupuku kei runga i te mata o te kiri. Whakamahia ai ko ngā whakatere ā-rārangi hei maimoa i ngā matepukupuku e noho hōhonu ana ki roto i te tinana. Tirohia a whārangi XX mō te roanga ake o ngā korero e pā ana ki ngā momo mīhini maimoatanga.

I te wā o te maimoatanga ka takoto pahoho koe, ka huri te mihini huri noa i a koe kia hāngai ai te tuku o te iraruke ki te pukupuku mai ngā koki rerekē. He rite ki te mahi a te whakaata roto. Kīhai koe e kite, e rongō rānei i tetahi mea i te wā o te maimoatanga.

Before radiation treatment

You will meet with a radiation oncologist, who will explain why you need this treatment and when it will take place. They will also answer any questions you may have.

Planning your treatment

The first part of treatment planning is called simulation, and is sometimes referred to as marking up or a **CT planning** session. You will have a CT scan as part of the planning process. You will need to visit the cancer treatment centre at least once before you begin treatment, so that the team can work out the position you will be placed in when having radiation.

The doctors and radiation therapists will use the information gathered from your planning appointment to develop an individualised treatment plan. Treatment usually begins two weeks or more after your planning session. In special circumstances people may have planning and treatment on the same day.



A CT scanning machine is used to get 3D information to help plan radiation treatment.

It is important to follow any instructions that you are given to prepare for your planning appointment. If you are unsure about the preparation instructions, call the radiation treatment department.

CT planning: Part one

During your appointment a radiation therapist will explain what is going to happen and ensure that you have all the required information. This is usually a good time to ask any questions you may have. Once everything has been explained, they may ask you to get changed into a gown or trousers, depending on what area of your body is to be treated.

You will be asked to lie down on the planning couch in a position that is as comfortable as possible. The radiation therapist may use a range of special supports to ensure that you stay in the same position for treatment. Let the therapist know if it is too uncomfortable.

“It’s like an X-ray machine. No worries. You’ve got a comfortable room, music going, then it’s over.” Milly

The radiation therapist will draw some pen marks on your skin (these will wash off). The radiation therapist will leave the room and you will automatically move through the scanner. While the radiation therapist is out of the room, they can see and hear you at all times. If you need



Here a radiation therapist is showing a patient her plastic mask, which will help her stay in position as she has treatment.

them you can call out or wave and they will come straight back in.

You will move through the centre of the scanner a few times during the scan. While you are having your scan you will not be able to feel or see anything, but you will hear a whirring noise when the scanner is on. Once the scan is finished the radiation therapist will come back into the room. You will be asked if they can make some small, permanent tattoo dots on your skin to show where the radiation will be given.

Making a mask (shell)

If you are having radiation treatment to your head, neck or throat, you may need to have a mask made. It is hard to keep your head still, so a mask is used to keep you in the right position for treatment. Pen marks will be drawn on the outside of the mask, not on your face.

Some people find the thought of wearing a mask throughout treatment quite distressing. Your doctor and radiation therapist can talk to you about your concerns, and are experienced in helping you to manage any feelings of claustrophobia.

“When they made the mask they were really good about talking to me and telling me what they were doing.” Anne-Marie

CT planning: Part two

For the next part of the planning process you do not need to go to the hospital. The doctor and the radiation therapist will use the information from your scan to plan your treatment.

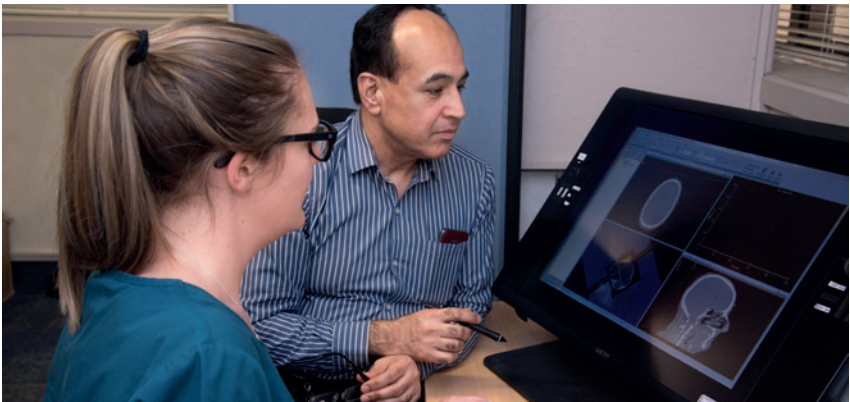
The radiation treatment team considers many factors, including:

- the type of radiation to use
- the size and shape of the area on your body that will be treated
- your position and the position of the machine
- how much radiation is to be given in the course of treatment.

Once the plan has been created it is checked by a team of experts to ensure that it is all correct. This part of the process can take up to three weeks. Once your treatment plan has been completed, you will be contacted with the date your treatment starts.

How long is a course of treatment?

External radiation is usually given in a number of treatments. Each treatment is known as a **fraction**. Fractions are usually given daily from Monday to Friday, with a rest at the weekend to help normal cells to recover. Sometimes treatment is only given on three days each week. It depends on several factors including your general health and the site and type of your cancer.



A radiation therapist and radiation oncologist working together to create an individualised treatment plan.

Curative (radical) radiation treatment

This type of radiation treatment is given with the aim of curing the cancer and is usually used in early stage cancer. This treatment may be given over two to eight weeks.

The damage to normal cells is mainly temporary (known as acute side effects). This is what causes the side effects of radiation treatment.

Palliative radiation treatment can be used when your cancer is no longer curable, to reduce and slow the growth of your cancer or to help relieve any symptoms you may be experiencing.

For example, palliative radiation treatment can be used to:

- help control pain
- reduce coughing
- help to control bleeding or swelling.

Palliative radiation treatment may be given in one or two sessions or it can be given over a longer period of time. When treatment is given in one or two sessions, it may cause short-term side effects.

Whakamahia ai te maimoatanga iraruke taurima i te wā kāre e taea te whakaora i tō matepukupuku, hei whakaiti, hei whakatōmuri hoki i te tipu o tō matepukupuku, hei āwhina rānei ki te whakahirihiri i ngā tohumate e rongo ana koe

Hei taurira atu, ka āhei te whakamahi i te maimoatanga iraruke taurima hei:

- āwhina i te mamae
- whakaiti ake i te maremare
- āwhina ki te whakahaere i te heke toto, i ngā pupuhitanga rānei.

Ka āhei te hoatu i te maimoatanga iraruke taurima i te wā kotahi, i ngā wā e rua rānei. Ka taea hoki te hoatu mō te wā roa ake rānei. Tērā pea, ka puta he pānga ki te taha mō te wā poto i ngā wā ka hoatuna i te wā kotahi, i ngā wā e rua rānei.

Having treatment

When you arrive each day, you may be asked to change into a hospital gown or trousers. The radiation therapist will take you to the treatment room. You will be asked to lie down on the couch in the same position you were in during your planning appointment. If you have had a mask made, this will be placed on you. The total time you spend in the treatment room will be around 10-20 minutes each treatment.

The radiation therapist will position you for your treatment and then leave the room. You will be able to call or signal them to come back into the room if you need to.

Even if you think the treatment has finished, it is important to stay still until you have been told it is okay to move.

Internal radiation treatment

If you have internal radiation treatment, radioactive seeds or wires (such as caesium, iridium or iodine) will be placed into the body close to your cancer, or into the cancer itself. By doing this, high doses of radiation can be delivered exactly where the cancer is without having to go through healthy tissue.

Your doctor might suggest treatment using internal radiation treatment alone or in combination with external radiation treatment and/or chemotherapy.

The types of internal radiation treatment include:

- **brachytherapy** - a radioactive source is placed inside the body, either close to or inside your cancer. The type of source depends on the type of cancer
- **radioisotope therapy** - a radioactive liquid is injected, or you swallow it, to target the cancer
- **intra-operative radiation** - radiation is given during surgery.
- These types are explained in more detail below.

A linear accelerator (pictured) is used to deliver radiation treatment.



Brachytherapy

There are two types of brachytherapy sources: temporary and permanent. The method used will depend on the type of cancer you have and the area of your body being treated.

Temporary sources

A temporary source is a very small radioactive source (inside an applicator that is not radioactive) that is placed in or near your cancer for a short amount of time. It is removed once each radiation treatment is complete. It is known as a high-dose-rate brachytherapy source.

Placing the applicator may take anything from 20 to 60 minutes and may require a small operation.

You will have your radiation treatment once or twice a day. The total amount of time spent in the treatment room is usually less than an hour.

The staff will leave the room for your treatment, but you will be able to talk to them if you need to. You may hear a slight buzzing noise and some beeps.

Planning your temporary source treatment

Before you start treatment, you will need a planning appointment where you will have a CT scan so that the radiation treatment team can create an individualised plan for you. You may also need an MRI scan. This process can take up to four hours. Your treatment plan is checked before each day of treatment, and may include a CT scan.

After each treatment you will not be radioactive, so you will not need to take any special precautions at home.

Temporary source treatment can be used for a number of cancers, such as:

- prostate cancer
- skin cancer
- gynaecological cancers of the cervix and endometrium
- oesophagus and bronchus cancer
- ocular (eye) cancers.

Maimoatanga iraruke ā-roto

Mehemea ka whai koe i te maimoatanga iraruke ā-roto, ka purua he kākano ira rukeruke, he waea kē rānei (pērā ki te caesium, iridium or iodine) ki roto i te tinana kia noho pātata ki tō matepukupuku, ki roto tonu rānei i te matepukupuku. Mā tēnei mahi, ka āhei te tuku i ngā horopeta kaha rawa, hāngai pū ki te wāhi e noho ana te matepukupuku me te karo i ngā kikokiko hauora.

Anei ētahi o ngā momo maimoatanga iraruke ā-roto:

- **brachytherapy** - ka purua he pū ira rukeruke ki roto i te tinana, tērā pea ka noho tata ki tō matepukupuku, ki roto kē rānei i tō matepukupuku. Ka hāngai te momo pū ki te momo matepukupuku
- **haumaru radioisotope** - ka werohia he wai ira rukeruke, ka horomia rānei e koe, hei whakawhāiti i te matepukupuku.
- **Iraruke intra-operative** - ka hoatuna te iraruke i te wā o te hāparapara.

E kore koe e noho iraruke whai muri i ia maimoatanga, nō reira, ehara i te mea me whai whakatūpatō motuhake koe ki te kainga.



A room equipped with a machine that is used for high-dose-rate brachytherapy temporary source treatment.

Permanent sources

A permanent source is a very small radioactive source (smaller than a grain of rice) that is placed, during a short surgical procedure, inside or near your cancer to deliver your radiation treatment. The radiation is released during the following few weeks and gradually reduces until there is no radiation left. This is known as low-dose-rate treatment.

Planning your permanent source treatment

Permanent sources are placed directly into your cancer, so the planning stage is one of the most important parts of your radiation treatment. You will need to go to the hospital to have an ultrasound or a CT scan so that the radiation treatment team can decide where to place the permanent source. You may require an anaesthetic and an overnight stay. Permanent source treatment can be used for some types of localised cancer, such as prostate cancer.

After each treatment you will be radioactive. You will need to take special precautions at home. Your radiation treatment team will advise you on what you need to do.

E kore koe e noho iraruke whai muri i ia maimoatanga, nō reira, ehara i te mea me whai whakatūpato motuhake koe ki te kainga.

Radioisotope therapy

Radioisotopes are given as liquids in capsules that are swallowed or given by injection into a vein in your arm.

The most common type of radioisotope treatment is radioactive iodine. It is used to treat tumours of the thyroid gland. You may be required to stay in hospital for two or three days in isolation after the treatment is given.

Radioactive iodine does not usually cause side effects, but you might feel very tired for a few weeks after having this treatment.

Please refer to the booklet *Understanding Thyroid Cancer* by Cancer Council Australia for more information. The booklet is available online at www.cancer.org.au

After being treated with radioactive iodine, you will be radioactive for about one week. You will need to take special precautions at home. Your radiation treatment team will advise you on what you need to do.

Whai muri i te maimoa iodine iraruke, ka noho iraruke koe mō āwhiwhi ki te kotahi wiki. Me whai whakatūpato motuhake koe i te kainga. Mā tō rōpū maimoa iraruke koe e tohutohu ki ngā whakaritenga me whai koe.

Radioisotope treatment for secondary bone cancer

Radioisotope treatment can be given for some cancers that have spread to people's bones (secondary cancer in the bone). A radioisotope is injected into a vein and is absorbed into the bone, so that the radioactivity damages the cancer cells. The aim of this treatment is to reduce pain and slow the growth of the cancer. You are likely to be given this as an outpatient.

It is important to follow the advice of your doctor after radioisotope treatment.

He mea nui kia whai koe i ngā tohutohu o te rata whai muri i te maimoa radioisotope.

Intra-operative radiation treatment

In intra-operative radiation treatment, low-energy radiation is given in a single dose during surgery for low-risk, early breast cancer. This is a new treatment and has limited availability in New Zealand.

Selective internal radiation therapy

Selective internal radiation therapy (SIRT) uses tiny radioactive beads to treat liver tumours that can't be removed by surgery. It is a recognised treatment option for hepatocellular carcinoma (HCC), cholangiocarcinoma, and colorectal cancer. SIRT is most often used to treat secondary tumours (metastases) in the liver from cancer that started in the large bowel.

SIRT isn't funded or available in New Zealand and you would have to travel to have the treatment. Your doctor will be able to advise you if this treatment is an option for you.

Most people have few side effects, but some may have more. These side effects go away in time.

Combining radiation treatment with chemotherapy

Chemotherapy can be given before, during, or after a course of radiation treatment. Chemotherapy and radiotherapy given together is called chemoradiation.

Chemotherapy can make cancer cells more sensitive to radiation treatment and is used to treat several types of cancer, for example rectal cancer and cervical cancer. The combination of treatments may be more effective than having either chemotherapy or radiation treatment alone.

Section one: Key points

1. Radiation treatment is the use of radiation beams to destroy cancer cells or stop them growing.
2. Radiation treatment only affects the part of your body at which the beams are aimed.
3. Radiation is used to:
 - cure cancers, often in addition to other cancer treatment
 - shrink a tumour so that surgery is more effective (neoadjuvant radiation treatment)
 - treat any cancer cells remaining after surgery (adjuvant radiation treatment)
 - reduce and slow the growth of cancer or relieve symptoms (palliative treatment).

4. There are two ways of giving radiation treatment: external beam radiation treatment and internal radiation treatment.
5. External beam radiation treatment does not make you radioactive.
6. Some types of internal radiation treatment can make you radioactive for a short time after you leave the hospital.

Tekiona tahi: Ngā kōrero matua

1. Ko te whakamahi i ngā hihi iraruke ki te patu i ngā pūtau matepukupuku te mahi a te maimoatanga iraruke, ki te whakamutu rānei i tō rātou tipu.
2. Ka whai pānga anake te maimoatanga iraruke ki te wāhi o te tinana ka tuhia ngā hihi.
3. Ka whakamahia te iraruke hei:
 - whakaora matepukupuku, hei nui ngā wā ka tāpiria ki te taha o ētahi atu maimoatanga.
 - hei tīngongo i tētahi pukupuku kia pai ake mō te mahi hāparapara - neoadjuvant maimoatanga iraruke.
 - Hei patu i ngā pūtau matepukupuku e toe ana whai muri te hāparapara - adjuvant maimoatanga iraruke.
 - Hei whakatōmuri i te tipu o te matepukupuku, hei whakahirihiri tohumate rānei, pērā ki te mamae kōiwi - (maimoatanga taurima).
4. E rua ngā momo huarahi hoatu ai i te maimoatanga iraruke: ko te maimoatanga iraruke hihi ā-waho me te maimoatanga iraruke ā-roto.
5. Kīhai koe e noho ira rukeruke nā runga i te maimoatanga iraruke hihi ā-waho.
5. Ka noho iraruke koe mō te wā poto nā runga i ētahi momo maimoatanga iraruke ā-roto whai muri i tō noho i te hōhipera.

Section two: Side effects of radiation treatment



No matter which area of your body is being treated, it is likely that you will experience some side effects. Your side effects will depend on:

- the amount of radiation you are given
- the area of your body being treated
- your individual response
- the type of radiation you receive
- other treatments you are having (for example chemotherapy).

Acute side effects are caused by the inflammation created by radiation beams passing through normal tissue. These side effects develop during the course of treatment, and are most noticeable a week to ten days after your treatment has finished. Most side effects will be greatly reduced around four to six weeks after the treatment has finished.

“I felt great for the first few weeks, but when I started to notice side effects in my second-to-last week, it was good to know this was normal.” Jiao Jiao

Chronic or late side effects may develop many months and sometimes years later.

Your treatment will be carefully planned to minimise both acute and chronic side effects, but some side effects are still possible. Your radiation treatment team will tell you what you may experience before you start treatment. If you are concerned about the side effects of your treatment, you can ask questions at any time.

Ka ata maheretia tō maimoatanga ki te whakaiti i ngā pānga tārūrū me ngā pānga mau tonu ki te taha, engari, tērā pea ka puta tonu he pānga ki te taha. Mā tō rōpū maimoatanga iraruke koe e kōrero mō ngā āhuatanga ka pā ki a koe i mua i tō tīmata i te maimoa. Mehemea kei te āwangawanga koe mō ngā pānga ki te taha i te wā o tō maimoatanga, e āhei ana koe ki te whakatakoto pātai, ahakoa te wā.

Feeling tired or fatigued

Most people having radiation treatment will experience tiredness or fatigue during their treatment. This can be caused by a number of factors:

- the radiation treatment and its side effects
- other treatments you may be having
- travelling to and from the hospital each day
- changes to your routine
- anxiety about treatment.

You may need to take time off work during and after your treatment. If this is going to be a problem for you, your radiation treatment team can refer you to a social worker. If you are having difficulty sleeping, let your radiation treatment team know.

Tips for coping with tiredness and fatigue:

- ask friends and family/whānau for help with chores and preparing meals
- take regular rests
- regular, gentle exercise is known to help
- let your treatment team know if you are not managing at home as there may be help available
- relaxation techniques can be helpful. See the section *Relaxation techniques* on page 56.

The Cancer Society information sheet *If you're having difficulty sleeping* is available on our website www.cancernz.org.nz.

Effects on your skin

Skin in the treatment area might become dry, flaky, red, itchy or sore - similar to sunburn. If you are unsure which parts of your skin will be affected, ask your radiation treatment team.

Your skin might also be more sensitive than usual to the sun and changes in temperature. Once your skin has healed, it is



recommended that you keep the area out of the sun and ask your doctor about using a sunscreen (at least SPF 30).

It is also recommended that you do not go into a swimming pool during your treatment, as you are likely to develop a skin reaction.

If you have a skin reaction, it will usually settle down four to six weeks after your treatment has finished. The treated area may be slightly darker than the surrounding skin.

Your radiation treatment team will teach you how to look after your skin during your treatment.

Only use products on your skin that have been recommended by your radiation treatment team.

Me whakamahi anake koe i ngā panipani mō tō kiri kua tūtohutia e tō rōpū maimoa iraruke.

Pain

Some people experience some pain or discomfort during radiation treatment. This can often be well managed with medication prescribed by a doctor.

Hair loss

You may lose some or all of the hair on the part of your body that is being treated, for example the scalp, chest, pubic area or face. This might be temporary or permanent.

If you have lost or are losing hair from your head, you could consider wearing a wig, hairpiece, hat, turban or scarf. If you decide to wear a hairpiece or wig, it is a good idea to get one fitted before you start losing your hair, so that it matches your style and colour as closely as possible. The Ministry of Health can help to pay the cost of a hairpiece, wig or head covering. Ask your doctor for a certificate that states your entitlement.

For more information, see the Cancer Society's information sheet *Coping with hair loss* on our website www.cancernz.org.nz.

Not wanting to eat

During radiation treatment you may notice changes to your appetite. Your sense of taste might also change, especially if you have radiation treatment to your head and neck. Please let your radiation treatment team know if you do not feel like eating, are losing weight or are having difficulty eating or swallowing food. They can recommend ways to make this easier for you. This may involve seeing a dietician.

For more information, see the Cancer Society's booklet *Eating Well During Cancer Treatment / Kia Pai te Kai te wā Maimoatanga Matepukupuku* on our website www.cancernz.org.nz.

Feeling sick and vomiting

You may feel sick if you are having radiation to the oesophagus (food tube), stomach, bowel, brain or pelvic area. Make sure you tell your radiation treatment team if you are feeling sick or vomiting. Your radiation oncologist can prescribe medication to help relieve these side effects.

Tips to help if you are feeling sick:

- avoid food with strong smells, or have it cold

- avoid food that is fatty, fried, spicy or very sweet
- eat small meals often rather than three large meals, as an empty stomach can make you feel sicker
- some people find that ginger and peppermint help
- drink plenty of fluids - having small amounts regularly may be easier to manage.

Tips to help if you have been sick:

- try taking small sips of fluids or suck on an ice cube
- try to eat something plain like crackers or dry toast
- if you continue to feel sick, let your radiation treatment team know.

Bowel problems

During radiation treatment to the pelvic area, the large bowel (colon and rectum) and anus can become inflamed.

You might find that you have some of the following symptoms:

- diarrhoea or loose stools
- needing to rush to the toilet, or leaking from your bowel
- feeling that your bowel has not emptied properly
- passing lots of wind
- passing blood from your bowel.

It is important to let your radiation treatment team know if you are experiencing any of these side effects.

Once radiation treatment has ended, the inflammation usually settles down over a few weeks or months. You may be left with long-term bowel changes.

Bladder problems

During radiation treatment to the pelvic area, you may experience some of the following bladder problems:

- needing to pass urine often (frequency)

- a burning sensation when you urinate
- feeling that you cannot wait when you need to empty your bladder (urgency)
- blood in your urine (haematuria)
- a weak flow of urine and your bladder not emptying completely
- needing to get up at night to urinate.

Less common symptoms include:

- a small amount of urine leaking (incontinence) - especially when you laugh, sneeze or cough
- pain when urinating
- passing blood clots
- difficulty passing urine.

It is important to let your radiation treatment team know if you are experiencing any of these side effects so that they can help you to manage them.

Mouth and throat problems

The lining of your mouth will react to radiation treatment. It may become sore, red and ulcerated, and you may develop a dry mouth and taste changes.

A sore mouth and throat

Let your radiation treatment team know if you have a sore or dry mouth. A dietician and speech language therapist may see you during your treatment.

“I did get a few ulcers in the back there, though spicy foods didn't set it off. It was strawberries and berries that did it.” Melinda

Tips to help:

- try to drink nutritious liquids such as milkshakes and smoothies
- let food and drink cool down before you eat/drink them
- if it is painful to chew or swallow, choose softer foods such as soup, yoghurt and porridge
- if you have a dry mouth, gravies and sauces will help you to chew and swallow food
- take pain relief as prescribed
- avoid smoking and alcohol
- avoid spicy foods such as chilli and curry
- avoid acidic foods such as kiwifruit, tomatoes and berries
- avoid foods with a rough texture, such as toast, chips and pastry.

For more information, see the Cancer Society's information sheet *Managing a sore mouth, dry mouth or mouth infections* on our website www.cancernz.org.nz.

Dry mouth

Saliva helps to protect your teeth from decay and helps you to eat. A dry mouth is caused by damage to the salivary glands from radiation treatment, and it can be permanent. This is most likely to occur when you are having radiation to your head and neck.

Tips to help manage a dry mouth:

- drink water often, carrying a water bottle with you can help you to remember to drink
- chewing sugar-free gum may help saliva flow
- there are products available to keep your mouth moist, speak to your radiation treatment team about these products and where to purchase them
- there are products that help to prevent dental decay and you will need to keep using them if your mouth is dry

- only use recommended mouthwashes
- you will need to have dental check-ups more often if your mouth is dry.

For more information, see the Cancer Society's booklet *Living with Dry Mouth/Te Noho me te Waha Maroke* on our website www.cancernz.org.nz.

Taste changes

Taste changes are caused by damage to your taste buds from radiation treatment, and the changes are usually temporary. This may mean you need to try different foods while you are having your treatment. Taste usually begins to recover several weeks after treatment finishes, but it may take many months to return, or it may be permanently changed.

If you are having radiation treatment to your mouth, your teeth will be more likely to decay. Discuss dental care with your doctor and dentist before your treatment starts, so that any dental work can be arranged before your radiation treatment begins.

For more information, see the Cancer Society's information sheet *Taste changes and chemotherapy and radiation treatment* on our website www.cancernz.org.nz.

Effects on your pelvic area

Radiation treatment to the pelvic area in women can cause inflammation of the walls of the vagina. When inflammation reduces, scar tissue can form, which can make the vagina narrower and shorter. The vaginal walls might be dry and thin and can stick together. Less vaginal lubricant may be produced. This can have three effects:

- make you more likely to get vaginal infections such as thrush
- make pelvic examinations uncomfortable
- make having vaginal intercourse painful and difficult.

To prevent scar tissue forming, you may be advised to use vaginal

dilators. Vaginal dilators are tampon-shaped plastic devices with rounded ends. There are a number of types available, and they come in varying sizes. You can also use a vibrator or your fingers to gently stretch the vagina to keep it supple. Instructions for using dilators/vibrators will be given to you by your radiation treatment team.

Regular sex can also help to keep the vagina healthy, but this may be uncomfortable at first. Positions where you are more in control of the pace and depth of penetration may be more comfortable. Ask your doctor or radiation treatment team for more information.

Men who undergo radiation treatment to the pelvis might experience erection problems and have less desire to have sex. This can be distressing, and may be a long-term side effect of radiation treatment. Talk to your radiation oncologist, as sometimes erection problems are permanent.

“*Through the treatment I lost all my sex drive. It's a real downer. Luckily I can talk to my partner about this.***”** Brent

Anal penetration may not be recommended during treatment to your pelvis, as your anus and rectum may also be affected by the treatment.

Ongoing concerns with intimacy, sex and sexual relationships

Talk to someone you trust if you are experiencing difficulties or ongoing concerns with intimacy and/or sexual relationships. Friends, family/whānau members, radiation therapists, nurses or your doctor may be able to help.

Your local Cancer Society can also provide information about sexual counselling services. You may also wish to read our booklet *Sex and Cancer*, which is available on our website www.cancernz.org.



Fertility

If you are having pelvic radiation and/or some chemotherapy combinations, you might become infertile either temporarily or permanently. Talk to your doctor about this before you start treatment.

Contraception during and after radiation treatment

While you are having radiation treatment you will need to use a reliable form of birth control. It is important that neither you nor your partner becomes pregnant, as radiation treatment may harm a developing baby. If you are pregnant now, talk to your doctor immediately.

Side effects of skin cancer treatment

Radiation treatment affects only the skin in the area being treated and it will not make you feel unwell. For a few weeks after treatment the treated skin will be red and inflamed. During this time it will look as though the treatment has made things worse rather than better. Try not to worry about this. After a few weeks the area will dry up and form a crust or scab. In another week or so the scab will peel away, leaving new skin underneath. It is important to not pick at the scab. At first the new skin will look pinker than the skin around it.

For some patients, the skin will have a tan in the area where radiation was given. This will gradually fade, and the treated area will look like the skin around it.

Lymphoedema

If you have radiation treatment to or near your lymph nodes, you will have an increased risk of developing lymphoedema.

Lymphoedema is a swelling of one or more parts of the body, caused by a build-up of lymph fluid in the surface tissues of the body. It can happen as a result of damage to the lymphatic system (for example, because of radiation treatment and/or surgery to an area of lymph nodes in the body). If this happens for you, talk to your doctor or nurse about ways to manage it.

For more information, see the Cancer Society's information sheets *Understanding lymphoedema* and *Living with lymphoedema* on our website www.cancernz.org.nz.

Section two: Key points

1. Your side effects will depend on:
 - the amount of radiation you are given
 - the area of your body being treated
 - your individual response
 - the type of radiation you receive
 - other treatments you are having (for example chemotherapy).
2. Side effects are often grouped into those that develop early on, during and at the end of your treatment (acute side effects), and those that develop many months and sometimes years later (late side effects).
3. Most side effects will be greatly reduced around six weeks after the treatment has finished. Your radiation treatment team will tell you what you are likely to experience.

Tekiona rua: Ngā kōrero matua

1. Ka hāngai ō pānga ki te taha ki runga i ēnei:
 - te nui o te iraruke ka hoatuna ki a koe
 - te wāhi o tō tinana e maimoatia ana
 - tōu ake urupare
 - te momo iraruke ka whiwhi koe
 - ētahi atu maimoa e whai ana koe (pērā ki te hahau)
2. I te nuinga ō te wā, ka whakarōpūhia ngā pānga ki te taha ki era ka puta moata, ki ērā ka puta i te wā o te maimoa, me ērā ka puta i te mutunga ō te maimoa (ngā pānga tārūrū ki te taha), tae noa ki ērā ka whanake i ngā marama, i ngā tau rānei ki muri (ngā pānga tōmuri ki te taha)
3. Ka tino heke te nuinga o ngā pānga ki te taha āwhiwhi ki te ono wiki whai muru i te maimoatanga. Mā tō rōpū maimoatanga iraruke e kōrero mō ngā āhuatanga tērā pea ka puta ki a koe.

A close-up photograph of a vibrant red flower, likely a species of Grevillea, featuring numerous long, slender stamens radiating from a central yellow-green base. The background is a soft, out-of-focus green.

Section three: Making decisions about treatment

While some people feel overwhelmed with information, others feel that they do not have enough. Understanding your illness, its possible treatment and its side effects will help you to make decisions.

Your treatment has been designed for your personal situation - the outcomes and side effects of your treatment will be different from those experienced by other people. Discuss your situation with a member of your radiation treatment team.

Sometimes it is difficult to make decisions about what treatment is right for you. You might feel that everything is happening so fast that you do not have time to think things through. Occasionally a decision will need to be made within a short timeframe to ensure that your treatment can begin as soon as possible. It is important to be fully informed before making a decision - it must be the right one for you.

For more information, see the Cancer Society's information sheet *Making decisions about your cancer treatment* on our website (www.cancernz.org.nz).

“*At first I wondered if ignorance was bliss, but after a week I thought, ‘No’. It’s my body and I want to know what was going to happen, and I want to know if I make a decision what will happen.” Silei*

A second opinion

You might want to ask for a second opinion from another specialist. Your specialist or general practitioner (GP) can refer you. You can ask for your records to be sent to the second doctor.

Talking with others

Once you have discussed treatment options with your doctor, you might want to talk them over with someone else. Talking it over can help to sort out what course of action is right for you.

The Cancer Society runs a peer-support programme called **Cancer Connect NZ**, which you may find helpful. Cancer Connect is a free peer-support programme that puts you in touch with a trained volunteer who has had a similar cancer and treatment. This person may be able to offer you practical advice and emotional support. Call the Cancer Information Helpline **0800 CANCER (226 237)** for more information.



Taking part in a clinical trial

Research into the causes of cancer and ways to prevent, detect and treat it is continuing. Your doctor might suggest that you consider taking part in a clinical trial. You could also ask if there is a clinical trial for your particular cancer. Clinical trials are a vital part of the search to find better treatments for cancer. They are done to test new or modified treatments, and to see if they are better than existing treatments.

Many people all over the world have taken part in trials that have resulted in improvements to cancer treatment. If you are asked to take part in a trial, make sure you fully understand the reasons for the trial and what it means for your treatment. You might wish to ask your doctor:

- Which treatments are being tested and why?
- What tests are involved?
- What are the possible risks or side effects?
- How long will the trial last?
- Will I need to go to hospital for treatment?
- What will I do if any problems occur while I am in the trial?
- If the treatment I receive on the trial is successful for my cancer, is there a possibility of carrying on with the treatment afterwards?

If you join a clinical trial, you will be given either the best existing treatment or a new treatment. The treatment you receive will be chosen at random and will be appropriate for your condition. Your health and progress will be carefully monitored throughout the trial.

If you join a trial, you have the right to withdraw at any time.

For more information, see the Cancer Society's booklet *Cancer Clinical Trials* on our website (www.cancernz.org.nz).



Experiences of people who have had radiation treatment

“Towards the end of my treatment, the side effects were pretty bad but, by noting what I could and couldn’t do each day, I could see progress, not just the setbacks.” Brian

“My only advice is to talk about it. Be very careful to listen to everyone. Be very careful because some are very forceful. If you listen to everyone, the right information will become apparent whilst the unusual advice may be the stuff you tend to ignore.” Gerald

“The big thing is to surround yourself with positive people, music, and quiet.” Silei

“One woman shared with me the tools of writing and I’ve still got that in the back of my mind – to actually sit down one day to do that. It’s a need to leave something. If I go tomorrow I want to leave a footprint.” Alofa

“Be yourself through this. Be optimistic. I think my judo has helped my whole mechanism. My discipline and training [from judo] has helped me focus and keep strong.” Milly

“Well, one of the things I thought about was that when you have the seeds they say you are not supposed to sit next to a pregnant woman, but how the hell do you know that she’s pregnant [in the early stages]? So I told Human Resources at work and it was a bit like a safety and health issue.” Paul

“At my last appointment they said, ‘See you later’ and I said, ‘Hang on a minute, I want to know this, this and this’, and they said, ‘Oh, okay, let’s start at the beginning’.” Melinda

Other treatments and therapies

Traditional Māori healing

Traditional healing has been an integral part of Māori culture for generations. Values, belief systems and teachings from kaumātua and tohunga alike have seen Māori focus on total wellbeing encompassing taha tinana, taha hinengaro, taha wairua and taha whānau (the physical domain, the domain of mind and behaviour, the spiritual domain and the family/whānau or social domain).

When Māori are faced with tough decisions on health care or treatment, some opt for traditional healing methods. These can include rongōā Māori, romiromi or mirimiri to name a few customary remedies based on native plants, massage therapy and spiritual healing.

If you are thinking about using these treatments, please talk about them with your radiation treatment team. Both parties aim to provide you with the best possible care that has minimal side effects. If you have difficulty expressing your needs to your treatment providers, find someone to advocate on your behalf so that both traditional

Māori healers and hospital treatment specialists are able to work together to support you on your cancer journey.

Hauora Māori

Mai rā anō te hauora Māori i noho ai hei wāhanga o te ahurea Māori. Nā ngā uaratanga, te pūnaha whakapono me ngā akoranga a ngā kaumātua me ngā tohunga i kitea ai te arotahi a te Māori ki te oranga kotahi e rarawhi ana i te taha tinana, te taha hinengaro, te taha wairua me te taha whānau.

Ka huri ētahi Māori ki ngā kaupapa hauora Māori i ētahi wā mēnā he uaua ki te whakatau ko tēhea, ko tēhea o ngā momo maimoa me whai. Tae noa rā ki te rongoā Māori, te romiromi, te mirimiri rānei, hei tauira atu. Ka hāngai katoa ki tarutaru otaota whenua me ngā rākau, te haumanu romiromi me te whakaoranga ā-wairua.

Mehemea he uaua ki te korere i o hiahia ki ngā kaiwhakarato maimoatanga, rapua tētahi tangata hei kaitaunaki mōu, kia āhei ai ngā tohunga hauora me matanga maimoa o ngā hōhipera ki te mahi ngātahi.

Pacific traditional healing

Traditional healing has long been used by Pacific people to help in their recovery. It involves taking a holistic approach to treating the person, where their mental, emotional, physical and spiritual needs are looked after together, rather than as separate parts. The treatment offered to each person can vary, depending on their needs. Medicinal plants and herbs may be used during the treatment process, as well as stones and massage.

The area of your body receiving radiation treatment should not be massaged during treatment and for several weeks afterwards. Massage may make side effects worse.

It is possible to use both Western and traditional medicine as part of your healing journey. Each has its place and benefits.

You may think that the doctor and the traditional healer do not need to know about what each other is doing. But it is important that they do in order to make sure that the medicines you are taking are working well together and they are not causing any problems. Traditional plant medicines can sometimes react with Western medications.

If you find it hard to tell your doctor or nurses about the traditional healing methods being used by your healer, it may be helpful for your doctor or nurses to talk directly to your healer or even a close family/whānau member who knows what treatments you are receiving.

Complementary and alternative therapies

Complementary therapies are massage, meditation, acupuncture and other methods that are used **alongside** medical treatments. They may help you to feel better and cope more easily with your cancer treatment.

“*When it was painful I transported myself to the market at home with fresh fruit. I remembered songs that have no words that reminded me of home, like streams and natural sounds. I imagined myself at moments throughout my lifetime – special places on the beach, certain things we did as children. I took myself there.” Silei*

Alternative therapies include some herbal and dietary methods, which are used **instead** of medical treatment. Many are promoted as cancer cures; however, none of these methods have been proven to be effective in treating cancer.

It is important to let your doctors know if you are taking any complementary or alternative therapies, because some treatments may be harmful if they are taken at the same time as medical treatments. For more information, see the Cancer Society’s booklet *Complementary and Alternative Medicine* on our website www.cancernz.org.nz.

Section three: Key points

1. While some people feel overwhelmed with information, others feel that they do not have enough. Understanding your illness, its possible treatment and its side effects will help you to make decisions.
2. Your treatment has been designed for you - the outcomes and side effects of your treatment will be different from those experienced by other people.
3. Sometimes it is difficult to make decisions about what is the right treatment for you. It is important that you understand the risks and benefits of treatment.

Tekiona toru: Ngā korero matua

1. Ahakoa ki ētahi, kei te pokea rātou e te maha o ngā pārongo, ara ētahi atu ka whakaaro kare i te rahi rawa a rātou pārongo. Ma te whai māramatanga mō tō mate, ki ngā maimoa tērā pea ka tarekatia, me ngā pānga ki te taha, e āwhina i a koe ki te whakarite whakataunga.
2. Ka whakahoahoatia tō maimoatanga mōu - ka rerekē ngā putanga me ngā pānga ki te taha o tō maimoatanga ki era ka pā ki ētahi atu tāngata.

I ētahi wā he uaua tonu ki te whakatau, ko tēhea te maimoatanga tika mōu. He mea nui kei te mārama koe ki ngā mōrearea me ngā painga o te maimoatanga.



Section four:
Looking after yourself
during radiation
treatment and beyond

Cancer can cause physical and emotional strain. Eating well, exercising and relaxing may help to reduce stress and improve wellbeing. Addressing changes in your emotions and relationships early on is also very important.

There are a number of things that might help you to cope, such as:

- preparing simpler meals
- being more relaxed about housekeeping
- asking children, family/whānau or friends to help more around the house.

“I had to allow myself not to feel guilty that the house was messy. It doesn't matter that the floor was not shiny or spick and span. After a month I realised all these things [a clean house and total order] did not matter. It's the people inside these walls that mattered.” Silei

For more information, see the Cancer Society's booklets *Coping with Cancer and Eating Well During Cancer Treatment* / *Kia Pai te Kai te wā Maimoatanga Matepukupuku* on our website www.cancernz.org.nz.

Te tiaki i koe anō

Tērā pea ka puta he taumahatanga ā-tinana, ā-kāre nā te matepukupuku. Mā te kai pai, me te korikori tinana, me te whakangohe e āwhina i a koe ki te whakaitit ake i ngā taumahatanga me te whakapiki i tō oranga. He mea nui te tere whakatau i ō kāre-ā-roto me ōu nā hononga tangata.

Mō te roanga o ngā pārongo e pā ana ki tēnei kaupapa, pānuihia te puka a Te Rōpū Matepukupuku o Aotearoa *Coping with Cancer*.

Psychological, social and counselling support

After your diagnosis you may experience many feelings: anxiety, fear, sadness and sometimes anger. You may never have felt this way before, and it can be overwhelming.

No matter how you are feeling, support services are available to you. If you speak to your GP, radiation treatment team or local Cancer Society they can refer you to someone such as a counsellor or psychologist, who can help you to manage these feelings by:

- encouraging you to talk about any fears, worries or emotions you may be feeling
- helping you to work through feelings of loss or grief
- teaching you ways to cope with any anxiety or stress
- showing you meditation or relaxation exercises
- suggesting ways to talk with your partner, family/whānau and friends.

During radiation treatment you will see your team every day. When treatment ends you may feel a little anxious or worried because you are no longer getting their regular reassurance and support. This is normal. You may find it helpful to talk about how you are feeling with your family/whānau, a friend, a counsellor or a cancer nurse.

For more information, see the Cancer Society's booklet *Getting on with Life after Treatment* on our website (www.cancernz.org.nz).

I te wā o tō maimoatanga iraruke, ka kite koe i tō rōpū ia rā, ia rā. Ka mutu ana te maimoa, tērā pea, ka āhua manawa popore koe, ka māharahara rānei koe nā te mea kua kore koe e whiwhi i ō rātou taunaki, i ō rātou tautoko hoki. He māori tērā. Tera pea, mā te kōrero mō ōu kare ā-roto ki tō whanau, ki tetahi hoa, ki tetahi kaitohutohu, ki tētahi tapuhi matepukupuku rānei, e āwhina i a koe.

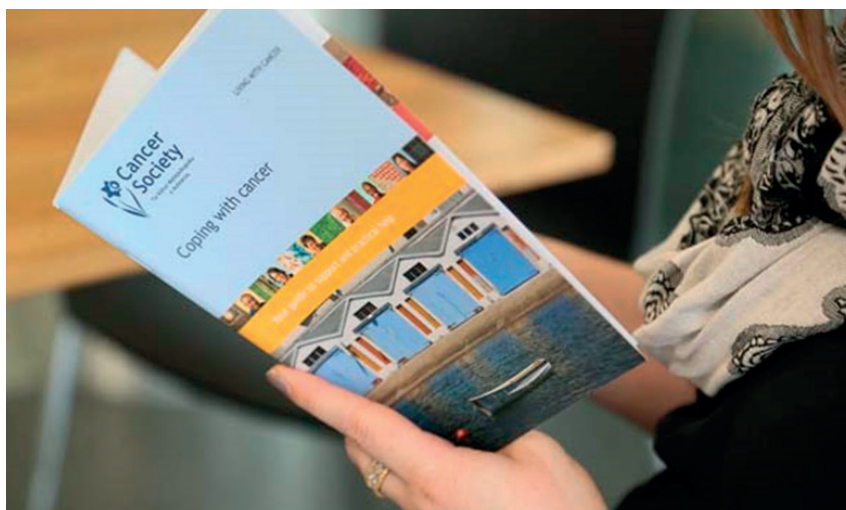
Mō te roanga ake o ngā kōrero, tirohia te pukapuka a te Kāhui Matepukupuku *Getting on with Life after Treatment* kei runga i tō mātou paetukutuku (www.cancernz.org.nz).

Social workers

Social workers are available to help support you and your family/whānau through the social and emotional changes that a cancer diagnosis brings. If you do not already have a social worker, your hospital doctor, GP or nurse can arrange a referral.

Social workers:

- provide information and support to help you and your family/whānau to cope with your cancer diagnosis
- help set up support services so that you can stay independent at home
- help with accommodation if you need to travel away from home for treatment
- help make travel arrangements if you are having treatment out of town
- offer advice and information about financial support available
- make referrals to other support agencies
- take part in multidisciplinary meetings that include different health professionals.



Cultural and spiritual support

Hospitals throughout New Zealand have trained health workers available to support your spiritual, cultural and advocacy needs. They may include Māori and Pacific health workers who will work with you and your family/whānau.

Hospital chaplains are available to people of all faiths and no faith, and offer support through prayer and quiet reflection.

Community-based health workers at your local marae and Pacific health services may also be good sources of support.

Interpreting services

New Zealand's Code of Health and Disability Services Consumers' Rights states that everyone has the right to have an interpreter present during a medical consultation. If you do not speak English as your first language or you are deaf, you may find it helpful to use an interpreter when you have your hospital appointments. Speak to a member of your health care team about arranging an interpreter in your local area.

For families/whānau and friends

Cancer can affect your whole family/whānau. When a friend or family/whānau member is diagnosed with cancer, you are also learning to cope with your own feelings and emotions. You may want to help but not know what to do. Here are some suggestions that may be useful:

- Learn about their type of cancer and its treatment. This will help you to understand what the person you are supporting is facing. But be careful about offering advice.
- Talk about your feelings together and be honest about what worries you.
- Try not to worry about what to say. Often listening while they talk or just being there with them is a good way to show that you care.
- Offer to go to appointments with them as a support person. You can take part in the discussions, take notes or simply listen.

- Respect that your family/whānau member or friend may want to talk to their doctor alone.
- Try not to do too much. Give them the opportunity to do things for themselves - they will probably appreciate the chance to be useful.
- Look after yourself and give yourself time to rest. Taking care of yourself will help you to take good care of them.
- It may be useful to ask one person to be a spokesperson for your family/whānau rather than talk to everyone yourself.
- Accept that sometimes you will need help from others - do not be afraid to ask for help from other friends or relatives.
- Consider joining a local support group.
- Seek counselling if you think it will help you.

For more information, see the Cancer Society's booklet *Supporting Someone with Cancer/Te Manaaki i Tētahi e Māuiui ana nā te Matepukupuku* on our website www.cancernz.org.nz.

Palliative care services

Palliative care is not just about care at the end of life. It is for people with advanced cancer and the focus is on improving their quality of life. Support can be offered in a hospital, a rest home, your own home or a hospice, and care is provided by specialist doctors, nurses, social workers and spiritual care workers.

It is a good idea to ask about palliative care early. Being able to deal with any problems or concerns early rather than waiting until they become difficult to manage can help to reduce stress for both you and your family/whānau.

In general, palliative care services are free. However, there may be a charge for the hire of some equipment for home care.

For more information on palliative care, see the Cancer Society's booklet *Advanced Cancer/Matepukupuku Maukaha* on our website www.cancernz.org.nz.

Atawhai Taurima

Ka arotahi te atawhai taurima ki te whakapiki i te kounga oranga - kua ko te atawhai anake mō te wā e whakamatemate ana rātou. Ka taea te whakarato i roto i te hapori, i tētahi hōhipera, tētahi kāinga whakatā, ki te kāinga, ki tētahi ratonga ‘hospice’ rānei.

Relaxation techniques

Some people find relaxation or meditation helps them to feel better. There are many relaxation resources and programmes available. Talk to your local Cancer Society about services in your area.

The Cancer Society has some relaxation resources that are available on CD or through our website:

- **Wellington Division’s *Relaxation and Visualisation* see the link:**
<https://wellington.cancernz.org.nz/en/how-we-can-help/want-local-support/relaxation-and-meditation-cd>.
- **Auckland Division’s *Relaxation and mindfulness* see the link:**
<https://auckland-northland.cancernz.org.nz/en/how-we-can-help/want-local-support/relaxation-and-mindfulness-cd>.

Exercise

Research indicates that regular, gentle exercise may help with fatigue and lift your mood. Talk with your doctor about what exercise is best for you.

For more information, see the Cancer Society’s pamphlet *Being Active When You Have Cancer* on our website www.cancernz.org.nz.

Home care

You may be entitled to assistance with household tasks or nursing care at home during your treatment. Your GP or social worker can refer you to community/district nursing services for assessment.



Cancer support groups

You may find that it helps to talk with others who have had cancer treatment. Cancer support groups offer practical and emotional support and information to people with cancer and their families/whānau. Ask your hospital or local Cancer Society for information about the support groups available in your area.

Financial assistance

Work and Income (0800 559 009) has pamphlets and information about the benefits and entitlements you may be eligible for while receiving cancer treatment.

For more information, see the Cancer Society's information sheets: *Benefits and entitlements* and *Benefits and entitlements: What happens when you apply for Work and Income support?* on our website www.cancernz.org.nz.

You may also be eligible for assistance with travel and accommodation costs if you need to travel long distances for your radiation treatment. For more information, see the Ministry of Health website (www.health.govt.nz/new-zealand-health-system/claims-provider-payments-and-entitlements/national-travel-assistance) or phone 0800 281 222.

Talking with your children

How much information you share with your children about your cancer and its treatment will depend on how old they are. The Cancer Society's booklet *Cancer in the Family* (www.cancernz.org.nz) gives a detailed summary of the likely level of understanding and possible reactions your children may have according to their age.

If you have concerns about changes to your children's usual behaviour, help and support are available. Speak with your child's teacher or school counsellor or ask your social worker for advice.

Section four: Key points

1. Cancer can cause physical and emotional strain. Eating well, exercising and relaxing may help to reduce stress and improve wellbeing. Addressing changes in your emotions and relationships early on is also very important.
2. In the time after diagnosis you may experience many feelings. Common reactions are anxiety, fear, sadness and anger.
3. No matter how you are feeling, support services are available to you. If you speak to your GP, radiation treatment team or local Cancer Society, they can refer you to someone such as a counsellor or psychologist who can help you to manage these feelings.

Tekiona wha: Ngā kōrero matua

1. Tera pea ka puta he riaka ā-kiko, ā-kare ā-roto na te matepukupuku. Tera pea ma te kai pai, ma te korikori me te whakaparohe, e āwhina ki te whakaiti i te kōhukihuki me te whakapai ake i te oranga. He mea nui me whakatau moata koe i ngā rerekētanga ki ō kare ā-roto me ō hononga.
2. I te wā whai muri i te whakatau mate, tērā pea ka puta te maha o ngā kare ā-roto ki a koe. Ko ētahi o ēnei, ko te mānukanuka, ko te matakū, ko te pōuri, ko te riri hoki.
3. Ahakoa tō āhua, kei te wātea ngā ratonga tautoko ki a koe. Mehemea ka korero koe ki tō GP, ki tō rōpū maimoatanga iraruke, ki tō Kāhui Matepukupuku ā-rohe rānei, ma ratou koe e tohu ki tetahi atu, pērā ki tētahi kaitohutohu, ki tētahi kaimātai hinengaro, e āhei ana ki te āwhina i a koe ki te whakahaere i aua kare ā-roto.

Appendix A: The technology involved in radiation treatment

Most external beam radiation treatment is given using a linear accelerator. However, it can also be delivered by a machine called a superficial machine SXR. This is used to treat things that are close to the skin surface. In this section we will concentrate on the linear accelerator.

The linear accelerator

The linear accelerator is a radiation machine that uses high-energy X-rays or electrons to treat cancer. It can be used to treat cancer in all areas of the body - in particular those that are not close to or on the skin surface.

The linear accelerator has an electron gun that propels a tiny charged particle (an electron) through a vacuum with an alternating magnetic field around it so that the particle reaches high speed. The speeding particle then hits a metal target within the machine, and its energy is changed to a beam of radiation that comes out and interacts with anything in its path. The higher the energy, the deeper the radiation's penetration into your body. The way a certain type of radiation behaves is important in planning radiation treatments.

During radiation treatment you will be positioned so the beam is directed to the part of your body that needs to be treated.

Different types of external beam radiation

Different types of external beam radiation treatment can be delivered by a linear accelerator. Below are some that are available in New Zealand. Not all centres in New Zealand use all these techniques.

Three-dimensional conformal radiotherapy (3DCRT) - where beams of radiation are used in treatment to match the shape of the area of the body being treated.



A radiation therapist will check your position before delivering your radiation treatment.

- **Intensity modulated radiation treatment (IMRT)** - uses a number of radiation beams to allow an even dose across the whole tumour. This means that the amount of radiation affecting normal tissue surrounding the tumour is reduced. As a result you may experience less long-term side effects.
- There are a number of ways to deliver IMRT:
 - Fixed-position IMRT (sometimes called static IMRT or step and shoot) is when the machine moves to a number of treatment angles and delivers radiation.
 - Continuous IMRT (called volumetric arc therapy) is when the radiation is delivered while the machine is moving slowly.

IMRT is useful in the treatment of cancers close to important organs or structures, such as treating pelvic tumours to reduce long-term bowel problems. It is used for head and neck tumours to reduce permanent mouth damage.

- **Image-guided radiation treatment (IGRT)** - uses images, taken using the linear accelerator, to check your position and compare it to your planning scan before giving your treatment. All radiation departments use some form of IGRT before your radiation treatment. How this is done varies around New Zealand.

For example the position of the prostate can change daily due to bowel and bladder movements. IGRT allows the treatment team to adjust the radiation to ensure it is always delivered accurately.

Special types of external beam radiation treatment

There are specialised types of radiation treatment for some types of cancer. These are available in some radiation centres in New Zealand. You may want to ask your radiation treatment team for more information about these types of treatment.

- **Four-dimensional planning and radiation (4D radiation)** - this allows both planning CT images and images taken just before treatment to capture movements of your tumour. It can be used during the planning of your treatment and also the delivery of your radiation. This is particularly helpful for a tumour that is in an area of the body that moves during the time of treatment, such as a tumour in the lung that moves as you breathe.
- **Deep inspiration breath hold (DIBH)** - this is used for treating tumours close to organs at risk of damage from any radiation dose. It is often used for left-breast and chest-wall cancer treatment due to the position of the heart. It involves holding your breath while the radiation is being delivered to increase the distance between the breast or chest and the heart. You will be assessed to see if this treatment is right for you.
- **Electron treatment** - sometimes the linear accelerator is used to produce a beam of electrons rather than x rays. These are used to treat cancers that are closer to the skin surface for example skin cancers.



Here a patient uses equipment for deep inspiration breath hold treatment.

- **Stereotactic radiotherapy (SBRT)** - this uses many small beams of radiation to deliver high doses to a very small tumour. It requires specialised positioning equipment and IMRT delivery. It allows a high dose to be given in one or a few fractions. This treatment is only suitable for a few people. SBRT can be used to treat small brain tumours and other small tumours within the body, such as in the liver or lung. Your radiation treatment team will discuss this with you.
- **Total body irradiation (TBI)** - this treats your whole body with radiation treatment. Radiation to the whole body damages bone marrow cells, so TBI is used for people who are having allogenic stem cell transplants as part of their treatment.

Internal radiation technology

In addition to radiation treatment that involves machines targeting cancer from the outside, internal radiation treats cancer from the inside.

Internal radiation treatment comes in two main forms: brachytherapy and radioactive liquid therapy also known as radioisotope therapy (see p 22).



Special devices are used to ensure that your position is correct for SBRT treatment.

Brachytherapy is a short-range therapy that closely targets the cancer through a radioactive source that is placed next to the tumour via surgery.

1. **High-dose-rate brachytherapy** uses a machine called an **after loader** and a series of tubes called catheters. The **after loader** stores the pieces of radioactive metal called Iridium. Each piece is about the size of a grain of rice.

There are a variety of ways these can be put into the body depending on which area needs treatment. For some areas, like the breast or prostate, they are inserted into the tissue and joined up with the catheters. For cervix patients an applicator might be used, and for skin patients a gel shell might be used. Again these are joined up with the catheters.

For each of these processes a CT scan is taken and a plan created. Once the plan has been done the iridium travels from the after loader, down the catheter and into the correct space in the applicator, needle or gel shell.

2. **Low-dose-rate brachytherapy** uses lower radiation doses for a longer time. In some cases the radioactive pellet is placed directly next to the tumour for a few hours or days. But sometimes it is inserted permanently. In this case the pellet slowly releases radiation, which fades over several months.

Radioactive liquid therapy treats cancer via the bloodstream. Treatment is given as a liquid containing radioactive molecules called radioisotopes. They travel through the bloodstream and accumulate in tumours where the radiation can penetrate and kill nearby cells. Some radioisotopes target tumours naturally, such as radioactive iodine. Iodine is naturally absorbed by the thyroid gland and doctors make use of this process to treat thyroid cancer.

In both brachytherapy and radioactive liquid therapy, the DNA-damaging radiation is delivered directly to tumour cells in a high dose, while surrounding healthy tissues receive a less damaging lower dose.

See www.cancerresearchuk.org for more information on internal radiation, or read more on page 20 of this booklet.

Appendix B: Suggested websites

You may be interested in looking for information about cancer and its treatment on the internet. While there are very good websites, be aware that others may provide incorrect information. We suggest that you discuss any information you find with your medical team.

We recommend that you begin with the Cancer Society's website www.cancernz.org.nz and follow our links. The following may also be helpful:

Cancer Council Australia (Australia)

www.cancer.org.au

Canterbury District Health Board (New Zealand)

This page includes a video that was made for the Christchurch Canterbury Regional Cancer & Haematology Service - Oncology Service. The video gives general information about what radiation treatment is, and how it is given.

www.cdhb.health.nz/Hospitals-Services/Cancer-Blood-Services/Canterbury-Regional-Cancer-Blood-Service/Radiation-Oncology/Pages/default.aspx

Centre for Medical Psychology and Evidence-based Decision-making (Australia)

Recovering after Pelvic Radiation Therapy, online PDF:
www.psych.usyd.edu.au/cemped/docs/Pelvic_Radiation_Therapy_Recovery_Booklet_for_Women.pdf

Macmillan Cancer Support (UK)

www.macmillan.org.uk

National Cancer Institute (USA)

www.cancer.gov/cancerinfo

Radiation Oncology: Targeting Cancer (Australia)

www.targetingcancer.com.au

The suggested websites are not maintained by the Cancer Society. We suggest sites that we believe offer credible and responsible information, but we cannot guarantee that the medical information on such websites is correct, up to date or evidence based.

For more information on using health websites and social media, see the Cancer Society's information sheet *Using the internet for cancer information* and support on our website www.cancernz.org.nz. You can also get a copy by phoning the Cancer Information Helpline **0800 CANCER** (226 237) or from your local Cancer Society.

Notes

You may wish to use this space to write down any questions for or advice given by your doctors, nurses or health providers at your next appointment.

Notes

Cancer Society of New Zealand Inc. - Te Kāhui Matepukupuku o Aotearoa

National Office

PO Box 651, Wellington 6140

Telephone: (04) 494-7270

Auckland Division

PO Box 1724, Shortland Street, Auckland 1140

Telephone: (09) 308-0160

Covering: Northland

Waikato/Bay of Plenty Division

PO Box 134, Waikato Mail Centre, Hamilton 3240

Telephone: (07) 838-2027

Covering: Tauranga, Rotorua, Taupō, Thames and Waikato

Central Districts Division

PO Box 5096, Terrace End, Palmerston North 4441

Telephone: (06) 356-5355

Covering: Taranaki, Wanganui, Manawatū, Hawke's Bay and Gisborne/
East Coast

Wellington Division

52-62 Riddiford Street, Newtown, Wellington 6021

Telephone: (04) 389-8421

Covering: Marlborough, Nelson, Wairarapa and Wellington

Canterbury/West Coast Division

PO Box 13450, Armagh, Christchurch 8141

Telephone: (03) 379-5835

Covering: South Canterbury, West Coast and Ashburton

Otago/Southland Division

PO Box 6258, Dunedin North, Dunedin 9059

Telephone: (03) 477-7447

Covering: Urban and rural Otago and Southland

Cancer Information Helpline

0800 CANCER (226 237)

www.cancernz.org.nz

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www.cancernz.org.nz

ANY QUESTION, ANY CANCER
0800 CANCER (226 237)
Cancer Information Helpline