



Understanding Radiotherapy

A guide for people with cancer,
their families and friends



Treatment

For information & support, call

13 11 20

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Note to reader

Always consult your doctor about matters that affect your health. This booklet is intended as a general introduction to the topic and should not be seen as a substitute for medical, legal or financial advice. You should obtain independent advice relevant to your specific situation from appropriate professionals, and you may wish to discuss issues raised in this book with them.

All care is taken to ensure that the information in this booklet is accurate at the time of publication. Please note that information on cancer, including the diagnosis, treatment and prevention of cancer, is constantly being updated and revised by medical professionals and the research community. Cancer Council Australia and its members exclude all liability for any injury, loss or damage incurred by use of or reliance on the information provided in this booklet.

Cancer Council

Cancer Council is Australia's peak non-government cancer control organisation. Through the eight state and territory Cancer Councils, we provide a broad range of programs and services to help improve the quality of life of people living with cancer, their families and friends. Cancer Councils also invest heavily in research and prevention. To make a donation and help us beat cancer, visit cancer.org.au or call your local Cancer Council.



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Introduction

This booklet has been prepared to help you understand more about radiotherapy, one of the main treatments for cancer.

Radiotherapy is also known as radiation therapy.

We cannot give advice about the best treatment for you. You need to discuss this with your doctors. However, we hope this information will answer some of your questions and help you think about other questions to ask your treatment team. It may also be helpful to read Cancer Council's booklet about the type of cancer you have.

The information in this booklet is for adults having radiotherapy, although much of it will also be relevant for children. Talk to your doctor for information specific to children.

This booklet does not need to be read from cover to cover – just read the parts that are useful to you. Some medical terms that may be unfamiliar are explained in the glossary. You may also like to pass this booklet to your family and friends for their information.

How this booklet was developed

This information was developed with help from health professionals and people affected by cancer who have had radiotherapy.

If you or your family have any questions, call Cancer Council **13 11 20**. We can send you more information and connect you with support services in your area. Turn to the last page of this book for more details.



**Cancer
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13 11 20**

Contents

What is cancer?	4
How cancer is treated	6
Key questions	7
What is radiotherapy?.....	7
How does radiotherapy work?.....	7
Why have radiotherapy?.....	7
How is radiotherapy given?.....	8
Where will I have treatment?.....	9
Can I have radiotherapy if I am pregnant?	10
Will I be able to work during radiotherapy?	11
How will I know the treatment has worked?.....	11
Which health professionals will I see?.....	12
Making treatment decisions	13
Talking with doctors	13
A second opinion	14
Taking part in a clinical trial	14
External radiotherapy	15
How long is a course of treatment?	16
Planning treatment	17
Treatment sessions	20
Is radiotherapy painful	23
Will I be radioactive?.....	23
Internal radiotherapy	25
Planning treatment	26

Brachytherapy 27
Radionuclide therapy 30
Selective internal radiation therapy (SIRT) 31

Managing side effects..... 33

How long will side effects last? 34
Fatigue..... 35
Skin problems 36
Appetite loss..... 36
Nausea 36
Bladder and bowel problems 37
Hair loss..... 37
Infertility 41
Sexuality and intimacy issues 42
Mouth problems 44

After treatment 47

Looking after yourself..... 47

Cancer Council services..... 48

Caring for someone with cancer 50

Useful websites 51

Question checklist..... 52

Glossary 53

How you can help..... 56



What is cancer?

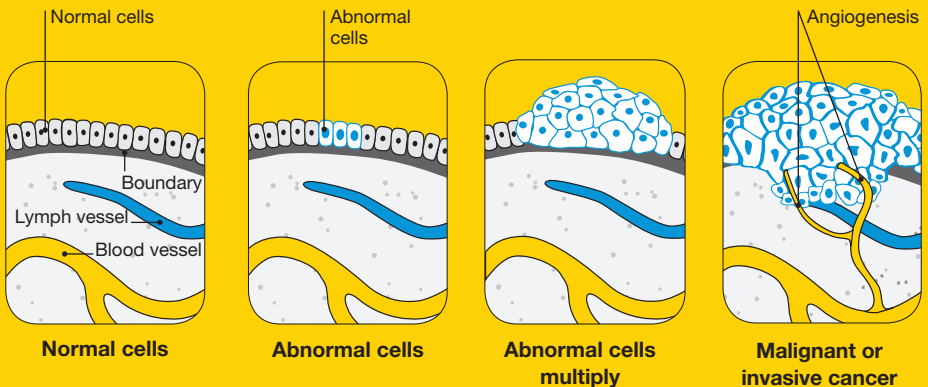
Cancer is a disease of the cells, which are the body's basic building blocks. The body constantly makes new cells to help us grow, replace worn-out tissue and heal injuries. Normally, cells multiply and die in an orderly way.

Sometimes cells don't grow, divide and die in the usual way. This may cause blood or lymph fluid in the body to become abnormal, or form a lump called a tumour. A tumour can be benign or malignant.

Benign tumour – Cells are confined to one area and are not able to spread to other parts of the body. This is not cancer.

Malignant tumour – This is made up of cancerous cells, which have the ability to spread by travelling through the bloodstream or lymphatic system (lymph fluid).

How cancer starts



The cancer that first develops in a tissue or organ is called the primary cancer. A malignant tumour is usually named after the organ or type of cell affected.

A malignant tumour that has not spread to other parts of the body is called localised cancer. A tumour may invade deeper into surrounding tissue and can grow its own blood vessels in a process called angiogenesis.

If cancerous cells grow and form another tumour at a new site, it is called a secondary cancer or metastasis. A metastasis keeps the name of the original cancer. For example, breast cancer that has spread to the bones is called metastatic breast cancer, even though the person may be experiencing symptoms caused by cancer in the bones.

How cancer spreads

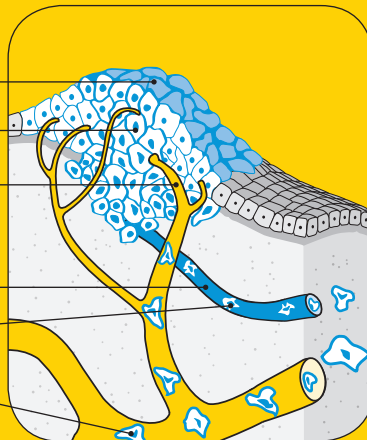
Primary cancer

Local invasion

Angiogenesis –
tumours grow their
own blood vessels

Lymph vessel

Metastasis –
cells invade other
parts of the body via
blood vessels and
lymph vessels





How cancer is treated

The aim of cancer treatment is remission or cure, which is when the signs and symptoms of cancer reduce or are no longer detected during routine tests. Your cancer treatment will depend on several factors, including:

- the type of cancer you have
- where the cancer began (the primary site)
- whether the cancer has spread to other parts of your body
- your general health
- your preferences.

Treatments for cancer include:

- **radiotherapy** – uses radiation to kill cancer cells in the body or damage them so they cannot grow or multiply
- **surgery** – aims to remove the cancer from the body
- **chemotherapy** – uses drugs to destroy cancer cells or slow their growth
- **immunotherapy** – uses antibodies or vaccines to help the body's immune system fight cancer cells
- **hormone therapy** – uses drugs to reduce or block the effect of natural hormones in the body that cause some cancer cells to grow.

Many cancers can be treated using these methods, either alone or in combination. For example, you may have surgery to remove the cancer followed by radiotherapy to target any remaining cancer cells.

When remission or cure are unlikely, radiotherapy, chemotherapy or other treatments can help to relieve symptoms, help you feel as comfortable as possible, and may allow you to live longer. This is called palliative treatment.



Key questions

Q: What is radiotherapy?

A: Radiotherapy uses radiation, such as x-rays, gamma rays, electron beams or protons, to kill cancer cells or damage them so they cannot grow or multiply. It is a localised treatment, which means it generally only affects the part of the body where the radiation is targeted.

Q: How does radiotherapy work?

A: Radiotherapy kills or damages cancer cells in the area being treated. Cancer cells begin to die within days or weeks of treatment starting and continue to die for weeks or months after it finishes. Although the radiation can also damage healthy cells, these can usually repair themselves.

You should not feel any pain during radiotherapy, but some side effects can cause pain or discomfort. Refer to the *Managing side effects* chapter (pages 33–46) for more information and ways to prevent or manage side effects.

Q: Why have radiotherapy?

A: Many people with cancer have radiotherapy. Research shows that at least one in two people with cancer would benefit from radiotherapy treatment.¹ It can be used for several reasons:

To achieve remission or cure – Radiotherapy is given with the aim of causing the signs and symptoms of cancer to reduce or disappear. This may be called curative treatment.

For control – Radiotherapy is given to control the cancer by making it smaller or stopping it from spreading.

To help other treatments – Radiotherapy is used before (neoadjuvant) or after (adjuvant) other treatments to make treatment more effective. It can also be used at the same time as some treatments, such as chemotherapy.

For symptom relief (palliative treatment) – Radiotherapy can help to relieve symptoms, such as pain or bleeding, to help you feel as well as possible. For example, it can help to reduce the pressure a tumour places on other organs in the body, which may relieve pain.

Q: How is radiotherapy given?

A: Radiotherapy can be given in two ways:

External radiotherapy – Radiation beams from a large machine called a linear accelerator are aimed towards the area of the body where the cancer is located. The process is similar to having an x-ray. You will lie on a treatment table underneath the machine, which will remain outside of your body. You will not see or feel the treatment, although the linear accelerator can be noisy.

Internal radiotherapy – A radiation source is placed inside the body, injected into a vein, or taken by mouth. Types of internal radiotherapy include brachytherapy,

where a temporary or permanent radiation source is put inside the body into or near the cancer; radionuclide therapy, where a radioactive substance is given as a capsule or liquid to swallow or via an injection; and selective internal radiation therapy (SIRT), which uses pellets to treat cancer in the liver.

You may have one or both types of radiotherapy depending on:

- the type of cancer
- the size of the cancer
- where the cancer is in your body
- whether you are having other cancer treatment
- your age and general health.

External and internal radiotherapy are described in more detail on pages 15–32.

Q: Where will I have treatment?

A: Radiotherapy is usually given in large hospitals or private clinics. It is delivered by specially trained staff called radiation therapists or nuclear medicine specialists, and is supervised by doctors called radiation oncologists, who are the main treating medical specialists for people having radiotherapy.

The linear accelerator that delivers external radiotherapy is large and takes up a lot of space, so it is located in a dedicated room. See page 16 for an illustration of a linear accelerator.

Travelling to appointments

While treatment schedules vary, most people have radiotherapy as an outpatient. This means you do not stay in hospital, but travel to the treatment centre for each session. Radiotherapy centres do their best to arrange your treatment at times that are convenient for you.

If you drive to treatment, you may feel tired after a few weeks and want to organise for someone to drive you.

If the treatment centre is a long distance from your home, you may be eligible for financial assistance towards the cost of accommodation or travel. Your local Cancer Council may also provide accommodation services.

For details, speak to the hospital social worker or radiotherapy department receptionist, call Cancer Council **13 11 20**, or visit your local Cancer Council website.

Q: Can I have radiotherapy if I am pregnant?

A: You will probably not be able to have radiotherapy if you are pregnant, as radiation can harm a developing baby. It's important that you don't become pregnant during treatment. Men who have radiotherapy should avoid getting their partner pregnant during treatment and for about six months afterwards, as radiation can damage sperm.

Your doctor will be able to give you more information about radiotherapy and pregnancy.

Q: Will I be able to work during radiotherapy?

A: Some people can continue to work during radiotherapy treatment, while others may need to reduce their hours or take time off. How much you are able to work depends on the type of radiotherapy you have, how the treatment makes you feel and the type of work you do.

Your treatment team will encourage you to be as active as possible, and they can answer your questions about working during treatment.

Q: How will I know the treatment has worked?

A: After treatment finishes, you will have regular check-ups with your doctor. You will have a physical examination, and you may have tests or scans to check whether the cancer has responded to treatment. It may be some time after radiotherapy finishes before the full benefit is known.

Because cancer cells continue to die for weeks or months after treatment ends, your medical team won't be able to give you progress updates during treatment. However, they can help you manage any side effects.

If radiotherapy is given as palliative treatment, the relief of symptoms will indicate that the treatment has worked. This may take a few days or weeks.

Q: Which health professionals will I see?

A: Your treatment team will be made up of health professionals who care for people having radiotherapy. Some of these are listed in the table below. You will also see other health professionals who specialise in diagnosing and treating the type of cancer you have.

Health professional	Role
radiation oncologist	the main treating medical specialist; prescribes and coordinates the course of radiotherapy
radiation therapist	plans and delivers radiotherapy
medical physicist	ensures that the radiotherapy machines are running correctly in order to deliver treatment accurately and safely; delivers radionuclide therapy and monitors radiation levels
radiation oncology nurses	help you manage emotional and physical problems, including side effects that you may experience during treatment
dietitian	can recommend an eating plan to follow while you are in treatment and recovery
social worker, psychologist	link you to support services and help you with any emotional issues associated with cancer and treatment
physiotherapist, occupational therapist	help you with any physical or practical issues associated with cancer and treatment



Making treatment decisions

Sometimes it is difficult to decide on the type of treatment to have. You may feel that everything is happening too fast. Check with your doctor how soon your treatment should start, and take as much time as you can before making a decision.

Understanding the disease, the available treatments and possible side effects can help you weigh up the pros and cons of different treatments and make a well-informed decision that's based on your personal values. You may also want to discuss the options with your doctor, friends and family.

You have the right to accept or refuse any treatment offered. Some people with more advanced cancer choose treatment even if it offers only a small benefit for a short period of time. Others want to make sure the benefits outweigh the side effects so they have the best possible quality of life.

Talking with doctors

When your doctor first tells you that you have cancer, you may not remember the details about what you are told. Taking notes or recording the discussion may help. Many people like to have a family member or friend go with them to take part in the discussion, take notes or simply listen.

If you are confused or want clarification, you can ask for further explanation – see page 52 for a list of suggested questions. If you have several questions, you may want to talk to a nurse or ask the office manager if it is possible to book a longer appointment.

A second opinion

You may want to get a second opinion from another specialist to confirm or clarify your doctor's recommendations or reassure you that you have explored all of your options. Specialists are used to people doing this.

Your doctor can refer you to another specialist and send your initial results to that person. You can get a second opinion even if you have started treatment or still want to be treated by the first doctor. You might decide you would prefer to be treated by the doctor who provided the second opinion.

Taking part in a clinical trial

Your doctor or nurse may suggest you take part in a clinical trial. Doctors run clinical trials to test new or modified treatments and ways of diagnosing disease to see if they are better than current methods. For example, if you join a randomised trial for a new treatment, you will be chosen at random to receive either the best existing treatment or the modified new treatment.

Over the years, trials have improved treatments and led to better outcomes for people diagnosed with cancer.

It may be helpful to talk to your specialist or clinical trials nurse, or to get a second opinion. If you decide to take part, you can withdraw at any time. For more information, call Cancer Council 13 11 20 for a free copy of *Understanding Clinical Trials and Research* or visit australiancancertrials.gov.au.



External radiotherapy

During external radiotherapy or external beam radiotherapy (EBRT), high-energy x-rays are directed at the cancer site from a machine called a linear accelerator. The radiation is aimed only at the part of the body where the cancer is; for example, if you have breast cancer, the radiation will be aimed only at your breast.

You will lie on a treatment table or treatment couch under the linear accelerator (see illustration, next page). The machine does not touch you, but it may rotate to send radiation to your body from different directions. This more accurately targets the cancer and limits the radiation to surrounding normal tissues. Once the linear accelerator is switched off, it no longer gives off radiation.

Different types of linear accelerators may be used – they each vary slightly in how they look and work. The type used will depend on the part of your body being treated and the reason for the radiotherapy. Some types are better at treating cancer near the skin; others are better for cancers deeper in the body.

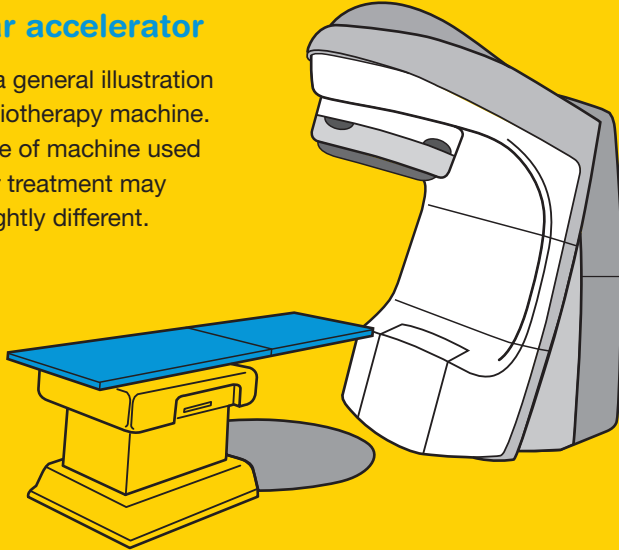
Several specialised types of external radiotherapy may be used to treat certain cancers. These include:

- three-dimensional conformal radiation therapy (3D-CRT)
- intensity modulated radiation therapy (IMRT)
- volumetric modulated arc therapy (VMAT)
- image-guided radiation therapy (IGRT).

Visit targetingcancer.com.au/radiation-therapy/ebrt for more information about the different types of external radiotherapy and to watch a video explaining the radiotherapy process.

Linear accelerator

This is a general illustration of a radiotherapy machine. The type of machine used for your treatment may look slightly different.



How long is a course of treatment?

A course of treatment refers to the number of sessions of radiotherapy you receive, that is, the time between your first and last radiotherapy sessions.

Courses vary between people depending on the type of cancer, the total dose required, the location of the cancer and the reason for treatment (e.g. curative treatment or symptom control). The total dose is usually divided into smaller doses called fractions.

In general, higher doses are given for curative treatment, usually over a longer period of time. If you are having radiotherapy as

palliative treatment to relieve symptoms, you may have only one or a few treatments in smaller doses.

Most people have radiotherapy from Monday to Friday for 4–8 weeks. Weekend rest breaks allow the healthy cells to recover. Occasionally, the radiation oncologist may recommend two treatments per day.

Each dose of radiation causes a little more damage to cancer cells, so it's important to attend all of your scheduled sessions to ensure you receive the required amount of treatment to eventually kill the cells or relieve symptoms.

Planning treatment

Treatment needs to be planned to ensure that enough radiation reaches the cancer while doing as little damage as possible to the surrounding healthy tissues and organs. To keep you in a stable position, your treatment team will decide whether any equipment is required, such as a cast or mould (see page 19).

Planning consists of several steps, which may occur over a few appointments. These steps are outlined in the table over the page.

Procedures may vary slightly depending on the treatment centre. While the information in this booklet will apply in most cases, you may find things are done differently where you have treatment.



Planning treatment steps



Initial appointment and examination

This may take up to two hours. Your radiation oncologist will discuss the benefits and side effects of radiotherapy and what to expect at each session and after treatment finishes.

You will have a physical examination and may be referred for further x-rays or scans to find out more about the cancer.

You may want to take someone with you to keep you company, ask questions and take notes.

You will see the radiation oncologist at least once a week during treatment.



Simulation

You will be asked to lie still on a table while the radiation therapists prepare you for a CT scan. Less commonly, they will use an x-ray machine called a simulator instead. For the scan, you will be placed in the same position on the table that you will be in for treatment.

The images from the CT scanner or simulator will build up a three-dimensional picture of your body. This will show the exact location and size of the cancer. You may also have other types of scans, such as an MRI scan, a PET scan or ultrasound.

The radiation therapists will send the images from the scans to a computer for examination by the radiation oncologist. The oncologist will prescribe the appropriate dose of radiotherapy, which will help the therapists to further plan your treatment.



Skin markings

To ensure you are positioned in the same way for each treatment session, 2–3 very small permanent ink spots (tattoos) will be marked on your skin. These tattoos are less than the size of a freckle and can't be easily seen.

Sometimes temporary ink marks are made on the skin. Ask the radiation therapist if you can wash these off or if you need to keep them until the full course of treatment is finished. The ink can be redrawn periodically during the course of treatment, but it will gradually fade.

If you have to wear a cast or shell (see next column), the markings will be made on this rather than on your skin.



Casts and moulds

If you need radiotherapy to your head or neck, you may wear a plastic mask called a cast or shell to help keep you still and to make sure the radiation is targeted at the right area. The cast will be specially made to fit you.

You will be able to hear, speak and breathe while wearing the cast, but it may feel strange and confining at first. Tell the radiation therapists if you feel worried or anxious, as they can suggest breathing or relaxation exercises, or give you a mild sedative.

You may need a stabilisation device (mould) to help keep a part of your body still during treatment sessions. This helps ensure that radiation is directed at the same part of your body each time. It also helps to protect healthy organs and tissues.

Treatment sessions

There will be two radiation therapists at each treatment session. They may ask you to change into a hospital gown before taking you into the treatment room. You will be able to leave your belongings in a secure locker.

The room will be in semi-darkness so the therapists can see the light beams from the linear accelerator and line them up with the tattoos or marks on your body or cast (if you are wearing one).

X-rays and scans

Before treatment begins, the therapists may need to take x-rays or a CT scan to ensure you are in the correct position on the treatment table. They may move the table or physically move your body. They will check the scans straightaway and make any adjustments so treatment can start.

Having treatment

Once you are in the correct position, the radiation therapists will go into a nearby room to operate the machine. You will be alone in the treatment room, but you can talk to the therapists over an intercom, and they will watch you on a television screen throughout the session.



If you smoke, try to quit before treatment starts to help make the treatment more effective. Quitting can be difficult, so talk to your doctor or call the Quitline on **13 7848**.



Waiting to go into the treatment room can make people feel anxious. Take something to read or listen to while you wait, or ask a friend or family member to keep you company. To help you relax during the session, try meditation or breathing exercises, or ask the radiation therapists if you can listen to music.

If you can't speak – for example, because you are wearing a cast – you can raise your arm to signal to the therapists, or you may be given a bell to ring to get their attention.

The therapists will move the machine automatically from outside the treatment room if you need treatment from different angles. The machine will not touch you.

You will not usually see or feel anything unusual, but you may hear a buzzing noise from the machine while it is working and when it moves.

It's okay to breathe normally, but it is important to stay very still to ensure the treatment targets the correct area. The radiation therapists will tell you when you can move. If you feel uncomfortable, tell the therapists – they can switch off the machine and start it again when you're ready.

The treatment itself takes only a few minutes, but each session may last 10–20 minutes because of the time it takes the radiation therapists to set up the equipment and put you into the correct position. You will be able to go home once the session is over.



Jackie's story

I was diagnosed with early-stage breast cancer after a routine mammogram. I had surgery, and my doctor recommended I have radiotherapy as well.

At my first appointment with the radiation oncologist, she explained what radiotherapy is and described what would happen during each session. She told me the radiation therapist would give me small tattoos to make sure the treatment reached the same area each time. I don't like tattoos, and it really caught me by surprise that I had to get them. As it turns out, they're very small and I didn't feel any pain having them.

At the simulation appointment, the radiation therapists placed me in the position I would be in at each session. They told me I had to keep very still to make sure the treatment was effective. I saw the room where

I would be having treatment, which was really helpful as it meant I knew what to expect at my first session.

I had treatment Monday to Friday for six weeks. Some days I had treatment very quickly, and on other days I had to wait a bit longer. I passed the time by reading a book or doing puzzles.

Each session took only a few minutes. I didn't find it hard to keep still, as the therapists positioned me very well and I was kept in place with a mould shaped like a wedge.

Towards the end of the six weeks, I started to feel very tired and I would sleep a lot. The nurses gave me cream and gel to put on the skin of the treatment area. I used it every day as soon as treatment started and for a short time after it finished. I developed dark marks that looked like burns, but most of them have faded.

Is radiotherapy painful?

Radiotherapy itself is painless. While lying on the treatment table, you may have pain due to the cancer, or you may feel uncomfortable because of the position you are in. The radiation therapists may suggest that you take pain medicine before each session to prevent any pain or discomfort.

Some people who have treatment to the head report seeing flashing lights or smelling unusual odours. This is common, but it is not harmful. Tell the radiation therapists if you experience these effects so they can monitor you.

Will I be radioactive?

External radiotherapy does not make you radioactive because the radiation does not stay in your body during or after treatment. You will not need to take any special precautions with bodily fluids, and it is safe for you to be with family, friends, children and pregnant women.

Concerns about radiotherapy

The linear accelerator is large and kept in an isolated room. This may be confronting or frightening, especially at your first treatment session. Some people feel more at ease with each session as they get to know the staff and procedures at the treatment centre. If you are afraid of confined spaces (claustrophobic), let the radiation therapists know so they can help you.



Key points

- In external radiotherapy, high-energy x-rays are directed at the cancer from a machine called a linear accelerator.
- The treatment is painless and does not make you radioactive. The radiation can't be seen or felt.
- The length of treatment will vary depending on the type of cancer, the prescribed dose, and the reason for treatment. Most treatments occur Monday to Friday for 4–8 weeks.
- During the simulation appointment, the radiation therapists will use a CT scanner or x-ray simulator to work out exactly where to direct treatment. You may also have other scans, such as an MRI, a PET scan or ultrasound.
- The scans will help the radiation oncologist to prescribe the correct dose of treatment to the exact location of the cancer.
- Your radiation therapists will put small marks (dots of ink or tattoos) on your skin to help to position you correctly.
- Some people need a special device, such as a cast or mould, to keep them stable during treatment sessions.
- Most sessions last for 10–20 minutes, but you will have radiotherapy for only a few minutes. Most of the time is spent setting up the equipment and placing you in the correct position.
- You will lie on a table called a treatment couch. The radiation therapists will be in the next room to control the machine. They will be able to see you and talk with you through a speaker, and pause treatment if necessary.



Internal radiotherapy

Internal radiotherapy is used only for certain types of cancer, such as prostate cancer, some gynaecological cancers, thyroid cancer, cancer in the liver, and some head and neck cancers. It delivers a high dose of radiation directly to the tumour, limiting the dose to surrounding tissues. Internal radiotherapy is given in different ways:

Brachytherapy – The radioactive sources are placed inside the body close to or inside the tumour. These sources are called implants. The type of implant used depends on the type of cancer and may include seeds, needles, wires or capsules.

Radionuclide therapy – Radioactive therapy is taken in capsule or liquid form, or given by injection. Radionuclide therapy is also called radioisotope therapy.

Selective internal radiation therapy (SIRT) – Tiny pellets containing a radioactive substance are injected into an artery to treat cancer in the liver.

Your doctor may recommend internal radiotherapy alone or in combination with external radiotherapy (see pages 15–24). You may have internal radiotherapy as an inpatient or outpatient, depending on the type of treatment you have.

Planning and treatment procedures for internal radiotherapy may vary between hospitals. The general process is described in this chapter. Your treatment team can give you more specific information.



Planning treatment

Planning for internal radiotherapy is different from planning for external treatment and will depend on whether you have brachytherapy (see opposite), radionuclide therapy (page 30) or selective internal radiation therapy (page 31).

Initial appointment – The radiation oncologist will explain the treatment process and tell you whether you will have treatment as an inpatient or outpatient. You will have tests and scans to help your treatment team decide where to place the implants and to determine the correct dose to deliver to the tumour. These tests may include an ultrasound, MRI scan and CT scan.

The oncologist will explain possible side effects and give you information about safety precautions you might need to take after treatment, as you may be radioactive for a short time when you return home.

Further appointments – You will usually see other specialists who are part of your treatment team. For example, you may see an anaesthetist if you will need anaesthetic during radiotherapy.



If you have radiotherapy as an inpatient, take reading material and other activities to keep you occupied while you're alone in the room. You may also be able to watch television or listen to music. Check with your doctor what you can take into the room, as there may be restrictions.

Brachytherapy

How are the implants placed inside the body?

The way the implants are placed inside the body varies.

Generally, one or more applicators will be inserted into or near the tumour for the implants to pass through and into the body. Applicators come in different shapes and sizes and are not radioactive.

The process of inserting the applicators and placing the implants inside them is often done in a dedicated room called a brachytherapy suite. In some hospitals, it is carried out in an operating theatre, which means you will need to stay in hospital for the day or overnight.

While you are under either a local or general anaesthetic, the doctor will use an x-ray machine or ultrasound scanner to guide the applicators into position. The placement of the applicators will depend on the type of cancer. For example, for prostate cancer, they will be inserted into the prostate gland; for gynaecological cancers, they will be placed into the vagina or uterus.

Once the applicators are in place, the implants will be put into or near the tumour through the applicators, either manually by the doctor or through a special machine.

The applicators will be removed from your body when treatment is finished. The implants may also be removed or they may remain in place permanently without causing any harm or discomfort (see next page).

How long will the implants be in place?

Implants can be temporary or permanent depending on the dose of radiation required.

Temporary implants – Some implants remain in place for 1–6 days before being taken out along with the applicator. You will stay in hospital during this time, usually in an isolated room or a room away from the main ward.

In other cases, the implants deliver radiation over a few minutes during multiple sessions as an outpatient. The applicator may be left inside you between sessions, or it may be inserted and removed each time.

Permanent implants – Seeds or pellets about the size of a grain of rice are put inside special needles and implanted into the body. They release small amounts of radiation over weeks or months. The implants are left in place permanently to gradually decay, and the needles are removed.

Will I be radioactive?

Brachytherapy will cause you to be radioactive for a short time, depending on whether the implants are temporary or permanent.

Temporary implants – While the implants are in place, some radiation may pass outside your body. For this reason, hospitals take safety precautions to avoid exposing staff and your visitors to radiation. Staff will explain any restrictions before you start treatment.

- You will be alone or in a dedicated treatment room within or close to the main hospital ward.
- Hospital staff will only stay in the room for short periods of time, and visitors may be restricted – children under 18 and pregnant women are usually not allowed to enter the room. You can use an intercom to talk with staff and visitors outside the room.

Once the implants are removed, you are not radioactive and there is no risk to other people.

Permanent implants – These will cause you to be radioactive for a short time after they are inserted. The radiation level drops over a period of weeks or months until no radiation is detected by tests. The radiation is not usually harmful to people around you, so it is generally safe to go home. Your treatment team will advise you of any precautions to take.

Will the implants be painful?

You should not have any severe pain or feel ill during brachytherapy. If the implants are being held in place by an applicator, you may feel some discomfort, but your doctor can prescribe medicine to help you relax and relieve any pain.

Once the applicator is removed, you may be sore or sensitive in the treatment area for some time. In some cases, you may have to limit physical and sexual activity for a period of time. Your doctor will advise you about this.

Radionuclide therapy

Radionuclide or radioisotope therapy is when radioactive material is taken by mouth as a capsule or liquid or given by injection to target cancer cells. Different radionuclides are used to treat different cancers.

The most common radionuclide therapy is radioactive iodine, which is taken as a capsule and used for thyroid cancer.

Radionuclide therapy may require a short stay in hospital. During this time, you will be radioactive and in a room on your own. The radioactive material that is taken up by the cancer cells decays and becomes less radioactive each day.

Any radioactive material not taken up by the cancer cells will be passed out of your body, mostly in urine, but also in sweat, saliva and faeces. Your treatment team will advise you to drink plenty of water and pass urine regularly to help reduce the amount of radioactive material in your body.

The level of radiation will be measured regularly during your hospital stay. You will be able to go home once the level is considered low enough for you to be around other people.



To read more about radioactive iodine treatment for thyroid cancer, call **13 11 20** and ask for a free copy of *Understanding Thyroid Cancer*, or download it from your local Cancer Council website.

You may need to take some safety precautions for a short while after you get home, such as limiting close contact with other people and being careful to avoid exposing others to bodily fluids, such as urine, faeces, saliva and sweat. Your radiation oncologist, medical physicist or nurse will discuss these precautions with you.

Selective internal radiation therapy (SIRT)

SIRT or radioembolisation is a way of delivering high doses of internal radiotherapy to treat tumours in the liver. The treatment uses tiny pellets called microspheres, which contain a radioactive substance. The pellets are injected into a thin tube called a catheter, which is inserted into the main artery (hepatic artery) that supplies blood to the liver.

Radiation from the microspheres damages the blood supply of the tumours. This means they are unable to get the nutrients they need and they shrink. Each pellet gives out radiation to a small area. Normal liver cells should only receive a small amount of radiation and there should be few side effects.

To plan for SIRT, you may need to stay in hospital for a night. Once the pellets are in place, they deliver radiotherapy continuously for 10–14 days. After treatment has finished, the pellets will remain in your body permanently without causing any harm or discomfort.

Read Cancer Council's booklet *Understanding Cancer in the Liver* for more information about SIRT.



Key points

- Brachytherapy uses radiation to directly target and destroy cancer cells.
- The radiation source or implant may include seeds, needles or wires and will be put into your body inside or near the tumour.
- How long the implants are left in place varies and depends on the dose required. Temporary implants can remain in place for minutes, hours or days. Permanent implants will not be removed.
- During treatment, you may need to stay in hospital in an isolated room, and visitors may be restricted.
- No radiation will be left in your body after a temporary implant is removed. If you have a permanent implant, the risk of exposing other people to radiation is very low, but you may need to avoid contact with young children and pregnant women for a short time. Your treatment team will advise you of any precautions you need to take.
- Radionuclide or radioisotope therapy is taken as a capsule or liquid, or given as an injection.
- The most common radionuclide therapy is radioactive iodine, which is used to treat thyroid cancer. It requires a short stay in hospital, usually in an isolated room. You will be able to go home as soon as the level of radiation in your body is considered safe for you to be around others.
- Selective internal radiation therapy or radioembolisation uses tiny beads to deliver high-dose radiotherapy, usually to the liver.



Managing side effects

Radiotherapy is an effective treatment for many cancers, but it can cause side effects because it also damages healthy cells at or near the treatment area. Some people experience many side effects, while others have very few or none. It's not unusual if the side effects you experience are different from someone else having the same type of radiotherapy.

Many factors can impact the type and severity of side effects, including:

- the type of radiotherapy
- the part of the body being treated
- the dose
- any other treatments you might be having
- your general health.

It is important to maintain your general health during treatment. People with diabetes in particular should ensure the condition is well managed – see your general practitioner before treatment starts.

Side effects can change from one period of radiotherapy to the next and may build up over time. During treatment, tell your radiation oncologist, radiation therapist or nurse about any side effects, as they can usually be controlled with the right care and medicine.



Always ask your radiation oncologist before using any medicines, home remedies or creams to ease side effects, as some may affect the way radiotherapy treatment works or make side effects worse.

How long will side effects last?

Most side effects go away in time. Some may be permanent, and others may not start until after treatment has finished (see *Late effects of treatment*, below). If you have severe side effects, the radiation oncologist may change the treatment or prescribe a break. However, pausing treatment may not be possible if the doctor thinks this could affect how well the treatment is working.

The tables on pages 38–40 list ways to manage side effects. For more information about radiotherapy side effects, refer to the booklet about the type of cancer you have. Call 13 11 20 and ask for a free copy, or download a digital version from your local Cancer Council website.

Late effects of treatment

Some side effects may not occur until many months or even years after treatment has finished. These are called late effects.

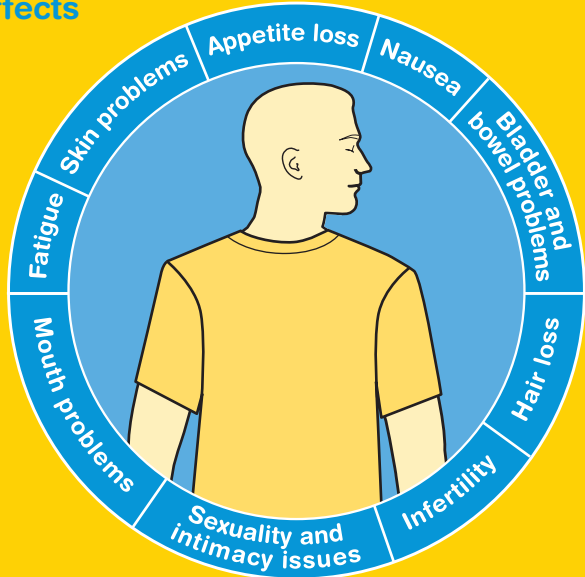
Late effects may be mild and may not have a major impact on your daily life, or they may be more significant. Some may go away or improve on their own, while others can be treated and managed.

Any late effects you experience will depend on the area of the body treated, and may include bladder and bowel changes and changes in sexual function.

You can read about ways to manage late effects in this chapter. Talk to your doctor if you experience side effects that are not described in this booklet.

Common side effects

The most common side effects of radiotherapy and ways to prevent or manage them are described in this chapter.



Fatigue

Feeling exhausted and lacking energy for day-to-day activities is a common side effect of radiotherapy. During treatment, your body uses a lot of energy dealing with the effects of radiation on normal cells. Fatigue can also be caused by travelling to treatment and appointments. It usually builds up slowly during the course of treatment, particularly towards the end, and may last for some weeks after treatment finishes.

Many people find that they cannot do as much as they normally would, but others are able to continue their usual activities.

Skin problems


External radiotherapy may make skin in the treatment area dry and itchy. Your skin may peel and look red, sunburnt or tanned, and it may feel painful. These reactions fade with time. You may need dressings and creams to assist healing, avoid infection and make you more comfortable.

Appetite loss

Some people lose interest in food during radiotherapy. This can depend on the part of the body being treated. For more information about appetite loss and nutrition, call 13 11 20 for a copy of *Nutrition and Cancer*, or download a digital version from your local Cancer Council website.

Nausea

If you have radiotherapy to your stomach, pelvic region or head, you may feel like vomiting (nauseous) during the session. This will usually improve shortly afterwards, but some people feel queasy for a few hours. Your radiation oncologist may prescribe medicine to take before each session to prevent nausea. For more information about managing nausea, talk to your doctor or nurse, or call Cancer Council 13 11 20.

“At first, I couldn't think about eating without thinking about throwing up. Drinking ginger beer helped control the nausea.”  Simon

Bladder and bowel problems

Radiotherapy to the stomach, lower abdomen or pelvic area can irritate the bladder and bowel.

Bladder changes include needing to pass urine more often or in a hurry. Some people may leak urine, for example, when they cough or sneeze. For ways to manage continence issues, talk to your doctor or call the National Continence Helpline on 1800 33 00 66.

Radiation may also irritate the lining of the bowel or stomach, causing diarrhoea. Symptoms include frequent loose bowel movements, abdominal cramps, minor bleeding and feeling an urgency to go to the toilet. To reduce the effects of radiation on the bowel during treatment, the radiation therapists may advise you to fill your bladder before each session. This will expand your bladder and push your bowel higher up into the abdomen, away from the radiation.

Hair loss

If you have hair in the area being treated, you may lose some or all of it during radiotherapy. The hair will usually grow back a few months after treatment has finished, but sometimes hair loss is permanent.

Generally, you will only lose hair in the treated area. However, when tumours on the face are treated, hair on the back of the head may be lost due to small amounts of radiation passing from one side of the head to the other.

Tips for managing radiotherapy side effects

Fatigue

- Listen to your body. If you feel tired, rest.
- Try to do fewer things and spread out your daily activities.
- Ask family and friends for help, e.g. with shopping, housework and driving.
- Take a few weeks off work during or after treatment, reduce your hours or work from home. Discuss your situation with your employer.
- Do some light exercise, such as walking, or keep up with your normal routine if possible. Regular exercise may boost energy levels and make you feel less tired. Talk to your treatment team about suitable activities for you.
- Limit caffeinated drinks, such as cola, coffee and tea. While they may boost your energy, caffeine can make you feel jittery and irritable, and cause insomnia and dehydration.
- Limit your alcohol intake.
- Eat a healthy, well-balanced diet, and don't skip meals.
- Smoking reduces your energy. If you smoke, talk to your doctor or call the Quitline on **13 7848** for support.

Skin problems

- Follow skin care instructions from your treatment team as soon as treatment starts, even before you notice any skin changes. You may be prescribed a special moisturiser if required.
- Wear loose, soft clothing made from cotton. Avoid tight-fitting clothes, belts or collars over the treatment area.
- Tell your treatment team about skin changes, e.g. cracks or blisters, moist areas, rashes, infections or peeling.
- Cover your skin before going outside and stay out of the sun when you can, as the treatment area will be more sensitive to sun damage.
- Avoid using public swimming pools, spas and saunas that contain chlorine, which can dry out skin.
- Let skin markings wear off gradually. Don't scrub your skin to remove them.
- Avoid using razors, hot water bottles, heat packs, wheat bags or icepacks on the treatment area. Bathe or shower in lukewarm water, as hot or very cold water can damage sensitive skin. Pat skin dry with a soft towel.



Appetite loss

- Eat smaller amounts as often as possible rather than a few large meals.
- Try to eat extra on days when you have an appetite.
- Ask a dietitian for advice on the best eating plan during treatment and recovery.
- If you don't feel like eating solid foods, try enriching your drinks with powdered milk, yoghurt, eggs, honey, or weight gain supplements.
- Do not use nutritional supplements or medicines without your doctor's advice, as some could interfere with treatment.
- Cooking smells may put you off eating. It may help if someone else prepares your food, or you could consider reheating precooked meals.
- If you have radiotherapy to the head and neck area, chewing or swallowing may be difficult or painful, and your sense of taste may change. See page 45 for ways to manage these effects.

Nausea

- Have a bland snack, such as toast and apple juice, before each session. You may find that ginger or peppermint flavoured food and drinks help to reduce nausea.
- Sip on water and other fluids throughout the day to prevent dehydration.
- Eat dry biscuits.
- Some people find that anti-nausea medicine helps. Ask your doctor for a prescription, and tell them if the prescribed medicine doesn't help – it may take some time to find one that works for you.
- Contact your doctor if the symptoms of nausea don't improve after a few days, or if you have been vomiting for more than 24 hours.

Tips for managing radiotherapy side effects



Diarrhoea

- Check with your treatment team before taking any home remedies. You may be prescribed medicine to relieve diarrhoea, and taking them together may cause unwanted effects.
- Avoid high-fibre and spicy foods, e.g. wholegrains, nuts, legumes and curries.
- Drink lots of clear liquids when you first notice symptoms of diarrhoea to avoid dehydration. Try apple juice, peach nectar, weak tea and clear broth.
- Eat or drink as well as you can so your body gets the energy and nutrients it needs.
- Slowly reintroduce fresh fruits, vegetables, and wholegrain breads and pasta after the diarrhoea has stopped.
- Contact your doctor immediately if you have blood in your bowel motions or if you have more than 5–6 bowel movements in 24 hours.

Hair loss from the head

- Wear a wig, toupee, hat, scarf or turban, or leave your head bare. Do whatever feels comfortable and gives you the most confidence.
- If you plan to wear a wig, choose it before treatment starts so you can match your own colour and style. Call Cancer Council **13 11 20** for information about wig services.
- If you leave your head bare, wear a hat, beanie or scarf to protect your head against sunburn and the cold.
- Talk to your hairdresser or barber about how to style your new hair. The hair that grows back may be thinner, or curly where it was once straight, and the new growth may be patchy for a while.
- Contact Look Good Feel Better. This program teaches techniques to help restore appearance and improve self-confidence during treatment. For details, visit lgfb.org.au or call **1800 650 960**.

Infertility

Having radiotherapy near your reproductive organs or to the abdomen could affect your ability to have children (fertility). Radiotherapy to the brain can affect the pituitary gland, which controls the hormones the body needs to produce eggs and sperm.

Effects on women – Treatment to the pelvic area or abdomen can cause periods to become irregular or stop for a short time. For some women, periods stop permanently, leading to menopause and infertility. If you wish to have children in the future, talk to your doctor before treatment starts about ways to preserve your fertility, such as storing eggs or embryos.

Effects on men – Radiotherapy to the pelvic area and testicles may temporarily reduce sperm production. You may feel the sensations of orgasm, but ejaculate little or no semen. This is called a dry orgasm. Semen production often returns to normal after a few months. For some men, the effect is permanent and causes infertility. If you want to father a child, you may wish to store sperm before treatment starts so your partner can conceive through artificial insemination in the future. Discuss this with your doctor.

Many people experience a sense of loss when they learn they may no longer be able to have children. If you have a partner, talk to them about your feelings. Talking to a counsellor may also help. For more information about infertility, call **13 11 20** for a copy of *Fertility and Cancer*, or download it from your local Cancer Council website.



Sexuality and intimacy issues

Radiotherapy can make you feel too tired or sick to want to be intimate. Some people may feel less sexually attractive to their partner because of changes to their body. Talking to your partner or a counsellor about your concerns may help.

Radiotherapy to the pelvic region

This can make sexual intercourse uncomfortable. You may notice a change in your sexual desire (libido). These changes are common and may only be short term.

Effects on women – Radiotherapy to the pelvic area usually affects the ovaries. This will cause women to stop having their periods, which is called menopause. The symptoms of menopause include hot flushes, dry skin and vaginal dryness.

Treatment to the vagina may cause the area to feel dry or itchy, or you may feel a burning sensation. Vaginal tissue may shrink and stiffen, making sex painful. Your doctor or nurse may suggest you use a vaginal lubricant or an instrument to expand the vagina (dilator), or they may recommend you have regular intercourse. Vaginal changes are usually not permanent, but for some women they can be. Discuss any concerns with your treatment team.

Effects on men – Men may have problems getting and maintaining erections, and ejaculation may be painful for a few weeks after treatment. Talk to your doctor if these effects are ongoing and causing you distress. They can suggest ways to manage them, such as prescription medicine.

Using contraception

Your doctor may talk to you about using contraception during or after radiotherapy.

During treatment – Although radiotherapy can affect fertility, it is still possible for a woman to become pregnant (unless the reproductive organs have been removed during surgery). A man having radiotherapy could get his partner pregnant.

Radiotherapy to the pelvic area may affect a woman's eggs (ova), and treatment to areas near the testicles may lead to the production of abnormal sperm. If pregnancy is possible, you will be advised to use contraception or avoid sexual intercourse during radiotherapy. Talk to your doctor as soon as possible if pregnancy occurs.

After treatment – Your doctor may recommend you use a barrier method of contraception (such as a condom or a female condom) for a certain period of time. This is to prevent the risk of infection if you have any sores on or near your genitals.

Your treatment team can give you information about having children after treatment.

Read Cancer Council's booklet *Sexuality, Intimacy and Cancer* for more information. Call **13 11 20** and ask for a free copy, or download it from your local Cancer Council website.



Mouth problems

Radiotherapy is often used to treat cancer in the mouth, throat, neck or upper chest region. Depending on the area treated, radiotherapy may affect your mouth and teeth. This can make eating and swallowing difficult and affect your sense of taste.

Treatment to the mouth may increase the chance of tooth decay or other problems in the future. You will need to have a dental check-up before treatment starts and regular check-ups after treatment has finished.

If you're seeing a dental specialist, such as an orthodontist, ask if they can liaise with your usual dentist about any work you need to have before radiotherapy treatment starts. Your dentist can give you detailed instructions about caring for your mouth and teeth to help prevent tooth decay and deal with side effects such as mouth sores.

Common mouth problems

After several weeks of treatment, your mouth or throat may become dry and sore, and your voice may become hoarse. These effects will gradually improve after treatment finishes, but it may take several weeks or even months. In some cases, the effects may improve but not completely disappear.

You may have thick phlegm in your throat, or a lump-like feeling that makes it hard to swallow. Food may also taste different. Recovery of normal taste can sometimes take many months after treatment has finished.

Tips for managing mouth problems



- If possible, have a dental check-up before treatment begins with a dentist who specialises in the effect radiotherapy has on teeth.
- Keep your mouth wet by sucking on ice chips and sipping cool drinks. Carry a bottle of water with you.
- Ask your doctor, nurse or pharmacist for information about artificial saliva to moisten your mouth.
- Avoid tobacco and alcohol, as they will worsen mouth dryness.
- If chewing and swallowing are painful, try to consume more liquids or soft food.
- Talk to a dietitian, who can suggest nourishing foods that will not hurt your mouth.
- If you have difficulty swallowing, ask your doctor for a referral to a speech pathologist.
- To manage taste changes, try different ways of preparing food. For example, add lemon juice to meat and vegetables, marinate foods or add spices.
- Talk to your doctor if eating is uncomfortable or difficult. If you are in pain, ask for pain relief medicine, which may help you eat well and feel better.
- Rinse your mouth regularly using a non-alcoholic mouthwash recommended by your doctor or dentist. Some people rinse their mouth with saltwater. This is a natural disinfectant. You can make a saltwater mouthwash at home by dissolving $\frac{1}{4}$ teaspoon of salt into 1 cup of warm water. Rinse your mouth with plain water afterwards.
- Call **13 11 20** or visit your local Cancer Council website for further information about taste and smell changes during cancer treatment.



Key points

- The side effects you experience will depend on the type and dose of radiotherapy, the part of the body being treated, your general health and other treatments you might be having.
- Your health care team can suggest ways to prevent and manage side effects.
- Some effects occur months or years after treatment finishes. These are called late effects.
- Fatigue is common during radiotherapy. Try to plan activities around your energy levels, and talk to family and friends about ways they can help you.
- If your skin is red or sore, keep the skin moisturised by using creams recommended by your nurse. Protect your skin when you go out in the sun, as the treatment area will be more sensitive to sun damage.
- Wear loose, soft clothing, and avoid tight-fitting clothes around the treatment area.
- A dietitian can advise you on the best eating plan during treatment and recovery.
- You may experience nausea and diarrhoea if you have treatment to the abdomen or pelvic area. Drink lots of fluids to prevent dehydration. Prescription medicine may help.
- Treatment may affect your fertility. If you would like to have children in the future, talk to your doctor before treatment starts.
- You will be advised to avoid pregnancy during treatment. You will need to use contraception or avoid having sexual intercourse.
- See your doctor if radiotherapy to the head area causes difficulty swallowing.



After treatment

After radiotherapy has finished, your treatment team will give you general information about your recovery. They will tell you how to look after the treatment area and recommend ways to manage side effects. They will also suggest who to call if you have any questions or concerns.

You will have regular check-ups with the radiation oncologist at the treatment centre. These will become less frequent over time. During these appointments, you will usually have a physical examination and you may have blood tests, x-rays or scans to confirm that the cancer hasn't come back or spread. You will also be able to discuss how you're feeling and mention any concerns you may have.

You may also have regular check-ups with other specialists who have been involved in your treatment.

Let your doctor know immediately of any health problems between these follow-up appointments.

Looking after yourself

Cancer and treatment can cause physical and emotional pain. It's important to try to look after your wellbeing as much as possible.

Eating well and staying active can help you cope. If you're finding it hard to adjust to the changes in your life, it may help to talk to a counsellor or someone who has had a similar experience. Turn the page for information about useful services and resources.



Cancer Council services

Cancer Council offers a range of services to support people affected by cancer, their families and friends.

Cancer Council 13 11 20 – This is many people's first point of contact if they have a cancer-related question. Trained professionals will answer any questions you have about your situation. For more information, see the inside back cover.

Practical help – Your local Cancer Council can help you access services or offer advice to manage the practical impact of a cancer diagnosis. This may include access to transport and accommodation or legal and financial support. Call 13 11 20 to find out what is available in your state or territory.

Support services – You might find it helpful to share your experiences with other people affected by cancer. For some people, this means joining a support group. Others prefer to talk to a trained volunteer who has had a similar cancer experience.

Cancer Council can link you with others by phone, in person or online at cancerconnections.com.au. Call us to find out what services are available in your area.

Life after cancer – It's natural to feel a bit lost after finishing treatment. You might notice every ache or pain and worry that the cancer is coming back.

Cancer Council can provide information and support to people adjusting to life after cancer – call 13 11 20 for details.

Printed, online and audiovisual resources – In addition to this resource, Cancer Council produces a wide variety of free information about cancer-related topics, including easy-to-read booklets and fact sheets on more than 20 types of cancer, treatment, emotional issues and recovery.

Cancer Council publications are developed in consultation with health professionals and consumers. Content is reviewed regularly according to best practice guidelines for health information.

Related publications

You might find the following free Cancer Council publications and audiovisual resources* useful:

- *Emotions and Cancer*
- *Nutrition and Cancer*
- *Talking to Kids About Cancer*
- *Understanding Clinical Trials and Research*
- *Understanding Complementary Therapies*
- *Relaxation and meditation CDs*
- *Cancer, Work & You*
- *Sexuality, Intimacy and Cancer*
- *Fertility and Cancer*
- *Caring for Someone with Cancer*
- *Exercise for People Living with Cancer*
- *Living Well After Cancer*
- *Living with Advanced Cancer*
- *Overcoming Cancer Pain*
- *Understanding Palliative Care*
- *Cancer and Your Finances*

Call **13 11 20** for copies, or download digital versions from your local Cancer Council website.

* May not be available in all states and territories.



Caring for someone with cancer

You may be reading this booklet because you are caring for someone with cancer. Being a carer can be stressful and cause you much anxiety. Try to look after yourself – give yourself some time out, and share your worries and concerns with somebody neutral, such as a counsellor or your doctor.

Many cancer support groups and cancer education programs are open to carers, as well as people with cancer. Support groups and programs can offer valuable opportunities to share experiences and ways of coping.

Support services such as Home Help, Meals on Wheels or visiting nurses can help you in your caring role. There are also many groups and organisations that can provide you with information and support, such as Carers Australia, the national body representing carers in Australia. Carers Australia works with the Carers Associations in each of the states and territories. Phone 1800 242 636 or visit carersaustralia.com.au for more information and resources.

You can also call Cancer Council 13 11 20 to find out more about carers' services and to get a free copy of the *Caring for Someone with Cancer* booklet, or download a digital version from your local Cancer Council website.

“It was very hard work, but I found that caring for my mother at home was one of the best things I could have done for her in her greatest time of need.” Janice



Useful websites

The internet has many useful resources, although not all websites are reliable. The websites listed below are good sources of support and information.

Australian

- Cancer Council Australia.....**cancer.org.au**
- Cancer Australia..... **canceraustralia.gov.au**
- Cancer Connections.....**cancerconnections.com.au**
- Carers Australia.....**carersaustralia.com.au**
- Department of Health..... **health.gov.au**
- Department of Human Services.....**humanservices.gov.au**
- healthdirect Australia..... **healthdirect.gov.au**
- Targeting Cancer
radiation therapy patient information..... **targetingcancer.com.au**

International

- American Cancer Society.....**cancer.org**
- Cancer.Net..... **cancer.net**
- Cancer Research UK..... **cancerresearchuk.org**
- Macmillan Cancer Support..... **macmillan.org.uk**
- National Cancer Institute..... **cancer.gov**



Question checklist

You may find this checklist helpful when thinking about the questions you want to ask your doctor about your disease and treatment. If your doctor gives you answers that you don't understand, ask for clarification.

- Why do I need radiotherapy?
- What do you expect the radiotherapy to do to the cancer?
- What kind of radiotherapy treatment will I have?
- Will it be my only treatment, or will I have other treatments?
- What side effects should I expect? Will they be long-term or short-term?
- How long will treatment take?
- Where will I have treatment? Will I have radiotherapy as an inpatient or outpatient?
- Will I be radioactive? Will my partner be affected?
- Is it safe to have sex during radiotherapy treatment?
- Will treatment interact with any other medicines or vitamins I am taking?
- When will I know whether the radiotherapy treatment has been successful?
- How much will treatment cost?
- Will the cost of my treatment be covered by health insurance?
- Can I get help with travel expenses or accommodation if I need it?



Glossary

abdomen

The part of the body between the chest and hips, which contains the stomach, spleen, pancreas, liver, gall bladder, bowel, bladder and kidneys.

anaesthetic

A drug that stops a person feeling pain during a medical procedure. A local anaesthetic numbs part of the body; a general anaesthetic causes a person to lose consciousness for a period of time.

applicator

A tool that is used to insert a radiation source into the body for brachytherapy.

benign

Not cancerous or malignant. Benign lumps are not able to spread to other parts of the body.

brachytherapy

A type of internal radiotherapy treatment in which radioactive material is placed into or near the tumour.

cells

The basic building blocks of the body. A human is made of billions of cells that are adapted for different functions.

chemotherapy

The use of drugs to kill cancer cells or slow their growth.

CT scan

A computerised tomography scan. This scan uses x-rays to create a picture of the inside of the body. It can be used to plan radiotherapy treatment.

curative treatment

Treatment given to damage or kill cancer cells.

external radiotherapy

Radiotherapy delivered to the cancer from outside the body.

fertility

The ability to conceive a child.

fraction

The individual, usually once daily, dose of radiation that makes up part of a course of radiotherapy treatment.

hormone therapy

A treatment that blocks natural hormones in the body that sometimes help cancer cells grow.

image-guided radiation therapy (IGRT)

A type of external radiotherapy that uses imaging techniques, such as x-ray or ultrasound, during each session to focus treatment on the correct area of the body.

immunotherapy

The prevention or treatment of disease using substances that alter the immune system's response.

infertility

The inability to conceive a child.

intensity modulated radiation therapy (IMRT)

A type of external radiotherapy in which the radiation beams are aimed from several directions, while the intensity (strength) is controlled by computers. This helps to reduce some side effects.

internal radiotherapy

Radiotherapy that delivers radiation

directly to the tumour from within the body.

linear accelerator

A machine used to create high-energy radiation beams for use in external radiotherapy.

lymphatic system

A network of tissues, capillaries, vessels, ducts and nodes that removes excess fluid from tissues, absorbs fatty acids, transports fat and produces immune cells. Includes the bone marrow, spleen, thymus and lymph nodes.

lymph nodes

Small, bean-shaped glands that form part of the lymphatic system. They collect and destroy bacteria and viruses. Also called lymph glands.

malignant

Cancer. Malignant cells can spread (metastasise) and eventually cause death if they cannot be treated.

menopause

When a woman stops having periods (menstruating).

metastasis

A cancer that has spread from another part of the body.

MRI scan

A magnetic resonance imaging scan. A scan that uses magnetism and radio waves to take detailed cross-sectional pictures of the body.

palliative treatment

Medical treatment for people with advanced cancer to help them manage

pain and other symptoms of cancer. Treatment may include radiotherapy.

PET scan

A positron emission tomography scan. A scan in which a person is injected with a small amount of radioactive glucose solution. Cancerous areas show up brighter in the scan because they take up more of the glucose.

radiation

Energy in the form of waves or particles, including gamma rays, x-rays and ultraviolet (UV) rays. This energy is harmful to cells and is used in radiotherapy to destroy cancer cells.

radionuclide therapy

The use of radioactive substances that can be taken by mouth as a capsule or liquid, or given by injection (intravenously). Also called radioisotope therapy.

radiotherapy

The use of radiation, such as x-rays, gamma rays, electron beams or protons, to kill cancer cells or injure them so they cannot grow and multiply. Also called radiation therapy.

selective internal radiation therapy (SIRT)

A type of internal radiotherapy used to treat liver tumours. Also called radioembolisation.

simulator

An x-ray machine that is used to ensure the correct alignment of the radiation treatment beam with the tumour.

surgery

An operation by a surgeon to remove or repair a part of the body affected by cancer.

three-dimensional conformal radiation therapy (3D-CRT)

A type of external radiotherapy that uses a computer to precisely map the location of the cancer within the body. Delivers high doses of radiation to the tumour while sparing the normal tissues as much as possible. Beams are usually delivered from several different directions.

tissue

A collection of cells that make up a part of the body.

tumour

A new or abnormal growth of tissue on or in the body. A tumour may be benign (not cancer) or malignant (cancer).

ultrasound

A non-invasive scan that uses soundwaves to create a picture of part of the body. An ultrasound scan can be used to measure the size and position of a tumour.

volumetric modulated arc therapy (VMAT)

A type of radiotherapy that rotates around the treatment area to deliver radiation to the body.

x-ray

A type of high-energy radiation that shows solid areas in the body.

Can't find a word here?

For more cancer-related words, visit:

- cancercouncil.com.au/words
- cancervic.org.au/glossary
- cancersa.org.au/glossary

Reference

1. GP Delaney, S Jacob, C Featherstone, MB Barton, *Radiotherapy in cancer care: estimating the optimal utilisation from a review of evidence-based clinical guidelines*, Collaboration for Cancer Outcomes Research and Evaluation (CCORE), Sydney, 2003.



How you can help

At Cancer Council, we're dedicated to improving cancer control. As well as funding millions of dollars in cancer research every year, we advocate for the highest quality care for cancer patients and their families. We create cancer-smart communities by educating people about cancer, its prevention and early detection. We offer a range of practical and support services for people and families affected by cancer. All these programs would not be possible without community support, great and small.

Join a Cancer Council event: Join one of our community fundraising events such as Daffodil Day, Australia's Biggest Morning Tea, Relay For Life, Girls' Night In and Pink Ribbon Day, or hold your own fundraiser or become a volunteer.

Make a donation: Any gift, large or small, makes a meaningful contribution to our work in supporting people with cancer and their families now and in the future.

Buy Cancer Council sun protection products: Every purchase helps you prevent cancer and contribute financially to our goals.

Help us speak out for a cancer-smart community: We are a leading advocate for cancer prevention and improved patient services. You can help us speak out on important cancer issues and help us improve cancer awareness by living and promoting a cancer-smart lifestyle.

Join a research study: Cancer Council funds and carries out research investigating the causes, management, outcomes and impacts of different cancers. You may be able to join a study.

To find out more about how you, your family and friends can help, please call your local Cancer Council.



Cancer Council 13 11 20

Being diagnosed with cancer can be overwhelming. At Cancer Council, we understand it isn't just about the treatment or prognosis. Having cancer affects the way you live, work and think. It can also affect our most important relationships.

When disruption and change happen in our lives, talking to someone who understands can make a big difference. Cancer Council has been providing information and support to people affected by cancer for over 50 years.

Calling 13 11 20 gives you access to trustworthy information that is relevant to you. Our cancer nurses are available to answer your questions and link you to services in your area, such as transport, accommodation and home help. We can also help with other matters, such as legal and financial advice.

If you are finding it hard to navigate through the health care system, or just need someone to listen to your immediate concerns, call 13 11 20 and find out how we can support you, your family and friends.

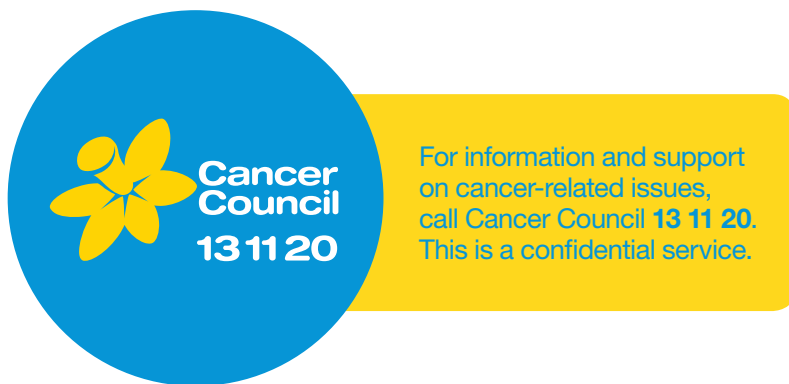
Cancer Council services and programs vary in each area.
13 11 20 is charged at a local call rate throughout Australia (except from mobiles).



If you need information in a language other than English, an interpreting service is available. Call 13 14 50.



If you are deaf, or have a hearing or speech impairment, contact us through the National Relay Service.
www.relayservice.gov.au



Visit your local Cancer Council website

Cancer Council ACT
actcancer.org

Cancer Council NSW
cancercouncil.com.au

Cancer Council NT
nt.cancer.org.au

Cancer Council Queensland
cancerqld.org.au

Cancer Council SA
cancersa.org.au

Cancer Council Tasmania
cancertas.org.au

Cancer Council Victoria
cancervic.org.au

Cancer Council WA
cancerwa.asn.au

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cancer.org.au

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To support Cancer Council, call your local Cancer Council or visit your local website.*