MACMILLAN CANCER SUPPORT

Understanding radiotherapy

About this booklet

This booklet is about radiotherapy. It is for anyone who is having radiotherapy or has been offered it as part of their cancer treatment. It is also helpful if you are a carer, family member or friend.

The booklet explains:

- the different types of radiotherapy
- what to expect before, during and after radiotherapy
- how radiotherapy is planned and given
- some of the general side effects of radiotherapy and ways to cope with these.

We hope it helps you deal with some of the questions or feelings you may have.

We cannot give advice about the best treatment for you. You should talk to your doctor, who knows your medical history.

How to use this booklet

This booklet is split into sections to help you find what you need. You do not have to read it from start to finish. You can use the contents list on page 3 to help you.

It is fine to skip parts of the booklet. You can always come back to them when you feel ready.

On pages 92 to 103, there are details of other organisations that can help. There is also space to write down questions and notes for your doctor or nurse (page 104).

Quotes

In this booklet, we have included quotes from people who have had radiotherapy, which you may find helpful. These are from people who have chosen to share their story with us. To share your experience, visit **macmillan.org.uk/shareyourstory**

For more information

This booklet does not have detailed information about radiotherapy for every type of cancer. We have other booklets that explain more about treatment and side effects for each cancer type. You can order these booklets for free (page 88). We also have more information about the side effects of radiotherapy in the following booklets:

- **Managing the late effects of bowel cancer treatment**
- **Managing the late effects of breast cancer treatment**
- **Managing the late effects of head and neck cancer treatment**
- **Understanding pelvic radiotherapy**
- **Managing the bowel late effects of pelvic radiotherapy**
- **Managing the bladder late effects of pelvic radiotherapy**

If you have more questions or would like to talk to someone, call the Macmillan Support Line free on **0808 808 00 00**, 7 days a week, 8am to 8pm, or visit **macmillan.org.uk** If you would prefer to speak to us in another language, interpreters are available. Please tell us, in English, the language you want to use.

If you are deaf or hard of hearing, call us using NGT (Text Relay) on **18001 0808 808 00 00**, or use the NGT Lite app. We have some information in different languages and formats, including audio, eBooks, easy read, Braille, large print and translations. To order these, visit **macmillan.org.uk/otherformats** or call **0808 808 00 00**.

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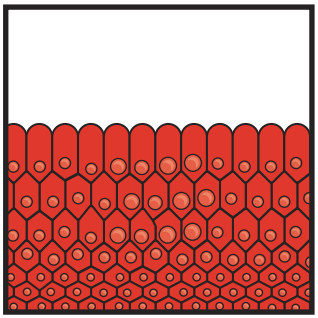
What is cancer?

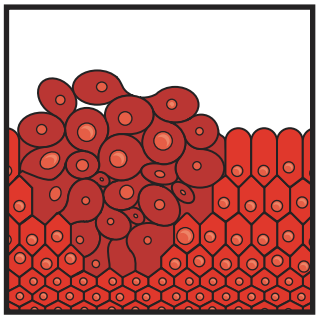
Cells are tiny building blocks that make up the body's organs and tissues. Cells receive signals from the body, telling them when to grow and when to divide to make new cells. This is how our bodies grow and heal. These cells can become old, damaged or no longer needed. When this happens, the cell gets a signal from the body to stop working and die.

Sometimes these signals can go wrong, and the cell becomes abnormal. The abnormal cell may keep dividing to make more and more abnormal cells. These can form a lump, called a tumour.

Abnormal cells forming a tumour



Normal cells



Cells forming a tumour

Not all tumours are cancer. Doctors can tell if a tumour is cancer by taking a small sample of cells from it. This is called a biopsy. The doctors examine the sample under a microscope to look for cancer cells.

A tumour that is not cancer (a benign tumour) may grow, but it cannot spread to anywhere else in the body. It usually only causes problems if it grows and presses on nearby organs.

A tumour that is cancer (a malignant tumour) can grow into nearby tissue.

Sometimes cancer cells spread from where the cancer started (the primary site) to other parts of the body. They can travel around the body in the blood or through lymph fluid which is part of the lymphatic system (pages 7 and 8). When these cancer cells reach another part of the body, they may grow and form another tumour. This is called a secondary cancer or a metastasis.

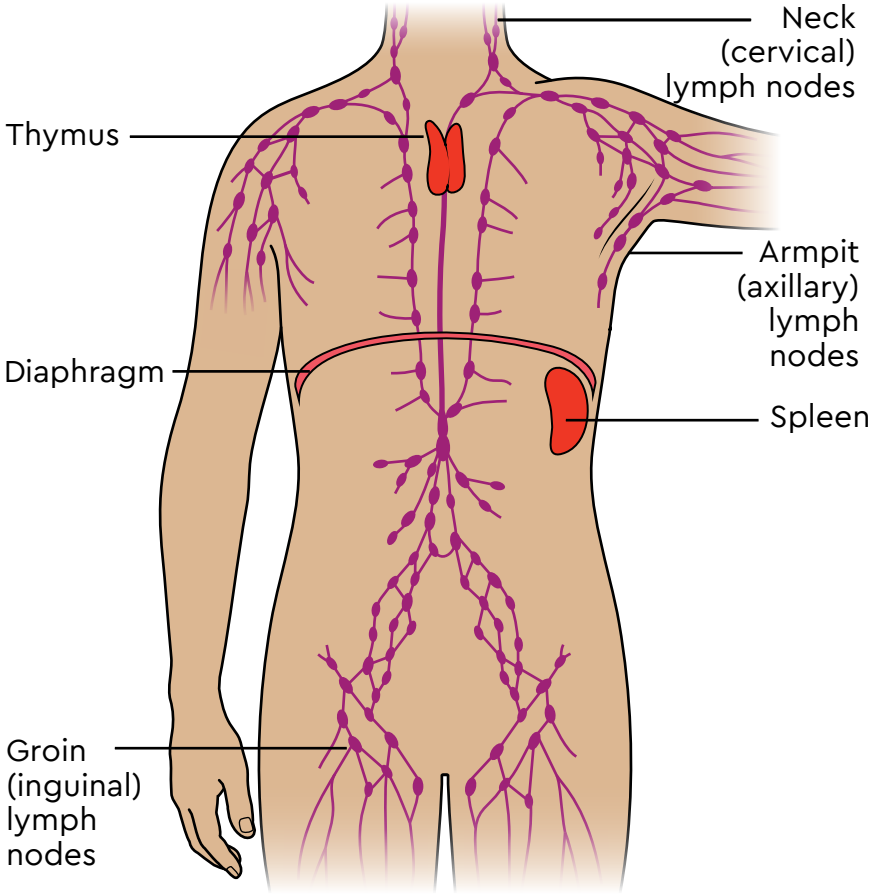
Some types of cancer start from blood cells. Abnormal cells can build up in the blood, and sometimes the bone marrow. This is where blood cells are made. These types of cancer are sometimes called blood cancers.

The lymphatic system

The lymphatic system helps protect us from infection and disease. It is made up of fine tubes called lymphatic vessels. These vessels connect to groups of small lymph nodes throughout the body. The lymphatic system drains lymph fluid from the tissues of the body before returning it to the blood.

Lymph nodes are sometimes called lymph glands. They filter bacteria (germs) and disease from the lymph fluid. When you have an infection, some lymph nodes may swell as they fight the infection.

The lymphatic system



What is radiotherapy?

Radiotherapy uses high-energy rays called radiation to treat cancer. It destroys cancer cells in the area where the radiotherapy is given.

Some normal cells in the area being treated can also be damaged by radiotherapy. This can cause side effects. These normal cells are usually able to repair themselves, but cancer cells cannot. As the normal cells recover, the side effects usually get better.

Radiotherapy is always carefully planned by a team of experts (pages 13 to 17). Radiotherapy treatment is continuing to become even more accurate. This allows your team to treat the cancer more effectively, while doing as little harm as possible to normal cells.

Why radiotherapy is given

Many people have radiotherapy as part of their cancer treatment. Radiotherapy is given for different reasons.

Radiotherapy to cure the cancer

This is when radiotherapy is given to try to destroy a tumour and cure the cancer. It is sometimes called radical treatment. You may have radiotherapy on its own or sometimes with chemotherapy. This is called chemoradiation (page 11).

Other treatments may also be given with radiotherapy. This may be as part of a clinical trial (page 19).

For some types of cancer, radiotherapy can be given after surgery. This lowers the risk of the cancer coming back. This is called adjuvant radiotherapy.

Sometimes radiotherapy is given before surgery to shrink a cancer and make it easier to remove. This is sometimes called neo-adjuvant radiotherapy. You may have it along with chemotherapy.

Radiotherapy to treat symptoms (palliative radiotherapy)

If curing the cancer is not possible, you may have palliative radiotherapy. It can help control the symptoms of cancer and sometimes it may help shrink the cancer.

For example, you may have palliative radiotherapy to help:

- control pain caused by cancer that has spread to the bones
- reduce coughing caused by cancer in the lungs
- control bleeding caused by certain types of tumours.

Ways of having radiotherapy

There are 2 ways of having radiotherapy:

- External beam radiotherapy is given from outside the body (externally) using a radiotherapy machine.
- Internal radiotherapy is when a radioactive material is placed inside the body. It is called brachytherapy or radioisotope therapy.

How you have radiotherapy will depend on where the cancer is in the body and the type of cancer. Some cancers are treated with both external and internal radiotherapy. Radiotherapy treatment is planned carefully for each person. This means that even if you know someone with the same type of cancer as you, their radiotherapy treatment may be different.

Chemoradiation

This is when you have chemotherapy at the same time as radiotherapy.

The chemotherapy makes the cancer cells more sensitive to radiotherapy. This can help make the radiotherapy work better. This is only used for certain types of cancer, so it is not suitable for everyone. Your cancer doctor or specialist nurse will explain what your course of chemoradiation involves.

If you have chemoradiation, your side effects may be worse than they would be if you were having just 1 treatment type. Your cancer doctor, nurse or radiographer will tell you how to manage and treat any side effects.

Having radiotherapy treatment

You usually have radiotherapy in a hospital that has a major cancer treatment centre. This means you may have some treatment at your local hospital. But you may have radiotherapy at a different hospital.

You usually have external beam radiotherapy as an outpatient. If you are unwell, or are having chemotherapy at the same time, you may need to stay in hospital. In this case, you will go to the radiotherapy department each day from the ward. If you have to travel a long way to the hospital for radiotherapy treatment you may be given it as an inpatient.

If you are having some types of internal radiotherapy, you may have to stay in hospital for a few days.

"“Good mornings” start the day, from the receptionists, radiologists, and fellow patients. Acknowledgements and smiles. The daily routine of confirming details and measurements, having treatment and leaving, is now normality."

Ruth

Radiotherapy team

A team of specialists are involved in planning and giving your radiotherapy. Here are some of the people you may meet.

Consultant clinical oncologist (cancer doctor)

A consultant clinical oncologist is a doctor who is an expert in radiotherapy, chemotherapy and other anti-cancer drugs used to treat people with different types of cancer. They specialise in planning and overseeing your course of treatment.

You may see a consultant clinical oncologist before, during and after your course of radiotherapy. Sometimes you may see a doctor from their team instead, such as a registrar. They are also very experienced in treating cancer. If you have any problems between appointments and need to see the doctor, the radiographers or nurses will arrange an appointment for you.

Therapeutic radiographer

Therapeutic radiographers are experts in radiotherapy and are specially trained to give you your treatment. They can also give you support, advice and information about your radiotherapy. They will:

- help plan your treatment
- help you get into the right position for treatment
- operate the radiotherapy machine to give you your treatment
- give you information, practical care and support throughout your treatment.

You will get to know a team of radiographers during your treatment. You can discuss any worries about your treatment with them.

Consultant therapeutic radiographer

Consultant radiographers are highly trained experts in treating specific types of cancer with radiotherapy. They specialise in planning and giving radiotherapy and providing support. You may see a consultant radiographer instead of a clinical oncologist before and during your course of radiotherapy.

Other specialist radiographers

You may see other radiographers who can give you expert advice and support during and after your treatment. For example, you might see a treatment review radiographer or an information and support radiographer.

Radiologist

A radiologist is a specialist doctor who will look at your scans with your consultant and help plan your treatment.

Physicist

A physicist is a radiation expert who helps plan your treatment. They work out the amount of radiation you need and the best way of giving it. They also check that the machines give the planned dose of radiation in the correct way.

Dosimetrist

A dosimetrist is an expert who helps to plan your treatment. They work closely with your doctor and physicist and use a computer to make sure the treatment is given to the right area and in the best way.

They also check treatment machines to make sure they are safe and accurate. Some dosimetrists help prepare radiotherapy masks and moulds, if you need one (page 26).

Nurses

Many cancer centres have specialist cancer nurses. They are sometimes called a clinical nurse specialist (CNS) or an advanced nurse practitioner. They have expert knowledge about the type of cancer you have.

Some radiotherapy clinics have nurses who give information about the treatment and its side effects. They may also give advice on skin care and medicines to manage side effects.

Your key worker

Your key worker is the person to contact if you need more information or support. Usually, one radiographer or specialist nurse in your team is your key worker. If you were referred from another hospital, your key worker may be based there. If you are not sure who your key worker is, ask someone at your next appointment.

Other health professionals

Other types of health professionals may be involved in your care. Who you may meet depends on what type of cancer you have and what help you need. They may include the following:

- Medical oncologist – a doctor who uses chemotherapy and other anti-cancer drugs to treat people with cancer.
- Haematologist – a doctor who diagnoses and treats blood disorders and cancers.
- Dietitian – someone who gives information and advice about food and food supplements.
- Speech and language therapist (SLT) – someone who gives information and support to people who have problems talking and swallowing.
- Physiotherapist – someone who gives advice about exercise and mobility.
- Occupational therapist (OT) – someone who gives information, support and aids to help people with tasks such as washing and dressing.
- Palliative care nurse or doctor – someone who helps with symptom control.
- Social worker – someone who can help sort out practical and financial problems.
- Counsellor – someone who is trained to listen to people's problems and help them find ways to cope.

Before your treatment

Giving your permission (consent)

Doctors need your permission (consent) before you have any treatment. Your healthcare team will give you all the information you need to make your decision. You should be told:

- the aim of the treatment – whether it is to cure the cancer or control it
- the benefits of the treatment
- the disadvantages of the treatment – for example, the risks and side effects
- any other treatments that may be available
- what may happen if you do not have the treatment.

Cancer treatments can be complex. It can also be hard to concentrate on what you are being told if you are feeling anxious. If the doctor says something you do not understand, ask them to explain it again.

You may decide not to have treatment even when your doctor advises you to have it. If you refuse treatment, your decision will be respected. But your doctor needs to make sure you have all the information you need to make your decision. You need to understand all your treatment options and what will happen if you do not have the treatment. Always talk to your doctor about any concerns you have, so they can give you the best advice.

Clinical trials

Some people are offered radiotherapy as part of a clinical trial. Clinical trials are used to find new and better treatments for cancer. Taking part in a clinical trial is completely your decision. Your team will explain what it involves.

We have more information about clinical trials on our website. Visit **macmillan.org.uk/clinical-trials**

Pregnancy

It is important that you do not get pregnant during your treatment. This is because radiotherapy given during pregnancy could harm a developing baby. Your doctors will be able to give you more information about this.

Before you consent to having radiotherapy, you will need to confirm that you:

- are not pregnant – you may need to provide a urine sample for a pregnancy test
- understand you should avoid getting pregnant during treatment – this means you will need to use a reliable form of birth control.

If you think that you may be pregnant at any time during your treatment, tell the doctors and radiographers straight away.

If you want to try and get pregnant after radiotherapy treatment, ask your doctors to tell you when it is safe to start trying.

Making someone pregnant

It may also be important that you do not make someone pregnant during treatment, and for a few months after it has finished. You can ask your doctors for more information about this.

Fertility

Your ability to get pregnant or make someone pregnant is called fertility. If this is important to you, talk to your doctor or nurse before you start treatment. They can explain if there is a risk of the radiotherapy affecting your fertility. They can also discuss possible options of preserving your fertility. We have more information in our booklets **Cancer and fertility – information for women**, and **Cancer and fertility – information for men** (page 88).

If you have a pacemaker, implantable cardiac device (ICD) or cochlear implant

You must tell your doctor or radiographer before or during your first planning appointment if you have:

- a pacemaker
- an implantable cardiac device (ICD)
- a cochlear implant (a hearing implant in your ear).

Radiotherapy can affect how these devices work. Your treatment is planned to allow for them. Even if the device is not in the area of treatment it is important to tell your doctor or radiographer.

You may have some additional tests before, during and after your treatment.

Planning your treatment

Before you start your treatment, it needs to be planned. This is to make sure that the radiotherapy is aimed precisely at the cancer. This will also mean it causes the least possible damage to the surrounding tissue. Your radiotherapy team will plan your radiotherapy carefully.

Some people may need to have a mould or radiotherapy mask made before treatment planning (page 26).

"I had a meeting about the procedure and side effects and then had my first session. The machine is a mobile arm that moved over me. The laser moved from one side of my breast to the other, on the areas identified, but I felt nothing. No sooner has the process begun than it is complete."

Ruth

"When you're in the CT scan, all the staff have to leave the room. But they give you an emergency button to press if you need them. It's fairly open, you can see the machine working, and the machine sort of whizzes around. If you look up, you can see the lights whizzing. It's not a bad experience. "

Jeremy

First planning visit

Your first planning visit usually takes 30 to 60 minutes, although it may take longer. Planning your treatment may take more than 1 visit. Your radiotherapy team will tell you what to expect. They will also tell you if there is anything you need to do to prepare for the appointment and your treatment. For example, before starting radiotherapy you may be asked to follow a special diet. Or you may be asked to drink plenty of water before each treatment.

It is important that you feel involved in your treatment. So, ask as many questions as you need to.

CT scan

You will usually have a CT scan of the area to be treated. This helps plan the precise area for your radiotherapy.

A CT scan makes a detailed picture of the inside of the body. The picture is built up using x-rays taken by the CT scanner.

Before your scan, the radiographer may ask you to:

- change into a hospital gown
- remove any jewellery or objects containing metal from your body
- have either a full or empty bladder.

During the scan you may have an injection of dye into a vein. It helps show certain areas of the body more clearly.

Preparing to have a CT scan

MRI or PET scans

Some people may have an MRI scan or a PET scan. An MRI scan uses magnetism to build up a detailed picture of areas of the body. A PET scan uses a low dose of radiation to check the activity of cells in different parts of the body.

During a scan

During your scan, you need to lie still on a hard couch. This is sometimes called a table. Your head, arms and legs may be supported with moulded plastic, foam or rubber cushions. If you have a mould or radiotherapy mask, it will also be carefully fitted to help you lie still.

It is important to tell the radiographers if you feel uncomfortable so they can make you more comfortable. The radiographers record the details of your position. You need to be able to lie in the same position for all your radiotherapy treatments.

The information from the scan is sent to a planning computer. Your radiotherapy team use this to work out the precise dose and area of your treatment.

Your healthcare team will tell you more about these scans.

We have more information about CT, MRI and PET scans on our website. Visit **macmillan.org.uk/cancer-information-and-support/diagnosis/tests-and-scans**

Radiotherapy moulds and masks

You may need to have a mould or radiotherapy mask made before radiotherapy planning starts. This is to help you stay still and in the correct position during your radiotherapy.

Moulds keep a leg, arm or other body part still during planning and treatment. Radiotherapy masks may be used for people having radiotherapy to the brain, head or neck.

Moulds and radiotherapy masks are made of a plastic mesh. The mesh is warmed and put on to your face or other body part. This allows the plastic to gently mould to fit the area being treated. Your mould or mask should fit tightly, but it should not be uncomfortable. The mesh takes a few minutes to harden. It is then taken off and is ready to be used when you have your treatment.

You may feel very nervous or claustrophobic if you have to wear a radiotherapy mask for treatment. But remember, you only wear it for short periods of time during planning and your radiotherapy. You can breathe normally while you are wearing it.

Most people cope well with the support of the radiotherapy team. If you are worried or uncomfortable, let them know so they can help you.

Sometimes your doctor can give you medication to take before the treatment to help you relax. But this is not usually needed.

We have more information about how masks for radiotherapy are made on our website.
Visit **macmillan.org.uk/radiotherapy-masks**

Wearing a radiotherapy mask

Skin markings

You may have markings made on your skin. These help the radiographers position you for treatment.

Usually, tiny permanent markings are made in the same way as a tattoo. The marks are the size of a pinpoint and are only made with your permission. It can be a little uncomfortable while they are being made, but it makes sure that the treatment is directed accurately. If you have a mould or mask, the marks may be made on this.

These marks will only be made with your permission. If you are worried about them or already have a tattoo in the treatment area, tell your radiographer. They can discuss this with you.

Skin care

During your radiotherapy, you will need to take extra care of the skin in the area that is being treated. This is because radiotherapy may cause a skin reaction. Before your treatment starts, your radiotherapy team will give you advice about looking after your skin. This will depend on the type of treatment you are having, and the area of your body being treated.

If you swim, ask your radiotherapy team whether you should avoid swimming. They may advise you to wait until a few weeks after you finish your treatment.

Other things to think about

Here are some other things to think about before you start your radiotherapy.

Help at home

Feeling tired is a common side effect of radiotherapy, so you may need help with daily tasks. Although it can be hard to ask for help, family and friends may be keen to do whatever they can. If you live alone or are caring for someone else, you can ask to see a hospital social worker. They can help you find out if there is any help available.

Getting to your appointments and travel costs

You may want to drive yourself to hospital for your treatment. But remember, you may feel more tired as your treatment progresses. If you feel tired, it is best to ask a family member or friend to drive.

If you are worried about getting to the hospital, tell the staff in the radiotherapy department. They may be able to arrange transport for you. Some local support groups and charities also provide transport.

If you have difficulty paying for your travel, you may be able to get help with travel expenses. Some hospitals may offer parking permits, or reduced parking charges. They may also refund the cost of parking if you are having daily radiotherapy treatment.

You may have a long journey to the hospital. Some hospitals offer hotel accommodation where you can stay overnight. You may have to pay for this. We have more information in our booklet **Help with the cost of cancer** (page 88).

Planning meals and snacks

Treatment and travelling to and from hospital can be tiring. Eating may be the last thing you think about on busy days. But it is important to eat and drink well during your course of radiotherapy.

If you can, plan ahead. Take snacks and drinks with you to the hospital on your treatment days. Shop before your treatments so there is food at home. Choose meals that are easy to prepare or make meals you can freeze for later.

Smoking

If you smoke, it is important to try to stop. Research shows that stopping smoking may make radiotherapy work better. It may also reduce the side effects of treatment.

It can be difficult to stop smoking, but you can get support. Many hospitals provide help or advice on how to quit smoking. Ask your cancer doctor, radiographer, or specialist nurse if your hospital provides this service.

If they do not, your GP, a pharmacist or an organisation may be able to help. You can contact your NHS stop smoking service for support (page 95).

We have more information to help you give up smoking on our website (page 88).

Work and study

If you are working or you are a student, it is a good idea to talk to your employer or tutors. They can make arrangements to support you and organise your time off during treatment. We have booklets about work and cancer (page 88).

Questions to ask about your radiotherapy

It is important to understand your treatment and the effects it may have on you. Your healthcare team will be able to answer your questions. It can help to write down your questions.

You may be able to take a family member or friend with you to appointments. They can take notes about what is said. You can also ask permission to record the conversation. Then you can listen to it again when you get home.

> **"Anything you're not sure about, they want you to ask. If you have any questions, please ask a member of staff. I found them so helpful."**
>
> Jeremy

You might want to ask some of these questions:

- What type of radiotherapy will I have? Does it have any other names?
- Why am I having this type of radiotherapy?
- What are the aims of the treatment?
- What hospital will I have my treatments in? Will I need to travel?
- How long will my course of treatment take?
- How often will I need to have treatment?
- What are the likely side effects of the treatment?
- Could there be any serious, long-term or late effects of the treatment?
- Are there other types of radiotherapy I could have?
- Are there any other treatments I could have instead of radiotherapy?
- How will the treatment affect my life? Will it affect my daily activities, work, sex life or fertility?
- Will I have follow-up appointments? If so, how often and who will they be with?
- Who should I contact if I need more information or have questions about my treatment?

Your data and the cancer registry

When you are diagnosed with cancer in the UK, some information about you, your cancer diagnosis and your treatment is collected in a cancer registry. This is used to plan and improve health and care services. Your hospital will usually give this information to the registry automatically.

There are strict rules to make sure the information is kept safely and securely. It will only be used for your direct care or for health and social care planning and research.

Talk to your doctor or nurse if you have any questions. If you do not want your information included in the registry, you can contact the cancer registry in your country to opt out.

External radiotherapy

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What is external beam radiotherapy?

External beam radiotherapy is when a radiotherapy machine aims high-energy rays at the area of the body being treated.

This treatment is normally given as a number of short, daily treatments in a radiotherapy department. These are called treatment sessions or fractions. The radiotherapy machine looks like a large x-ray machine or CT scanner. There are different types of radiotherapy machine. The most commonly used machine is called a linear accelerator (LINAC).

Radiotherapy using a LINAC machine

You usually have external beam radiotherapy as an outpatient. You sometimes have it during a hospital stay. Your doctor, radiographer or nurse will explain the treatment plan to you. This includes how many treatment sessions you will have, and when and where you will have them. The number of treatment sessions you have will depend on the type of cancer you have and the aim of the treatment.

The person who operates the machine is called a radiographer. They give you information and support during your treatment.

Curative (radical) radiotherapy

The term radical radiotherapy is used when doctors are hoping to cure the cancer. It usually involves having several treatment sessions. This is called a course of treatment.

You usually have 1 session of radiotherapy a day, often with a rest at the weekends. Some radiotherapy departments give treatment at the weekend. This means you would have rest days during the week instead. For certain types of cancer, treatment is given up to 3 times a day.

The treatment may last between 1 and 8 weeks.

Having the treatment in several sessions means that normal healthy cells have time to recover between treatments. You may have curative radiotherapy:

- on its own
- before or after other treatments such as surgery
- before, after or with other treatments such as chemotherapy, hormone therapy or targeted therapy.

Palliative radiotherapy

If curing the cancer is not possible, you may have palliative radiotherapy. It can help control the symptoms of cancer and sometimes it may help shrink the cancer.

For example, you may have palliative radiotherapy to help:

- control pain caused by cancer that has spread to the bones
- reduce coughing caused by cancer in the lungs
- control bleeding caused by certain types of tumour.

How many treatment sessions you have depends on your situation and the type of cancer you have.

You may have 1 to 5 sessions of treatment. Sometimes you may have a course of up to 10 to 15 sessions. For some types of brain tumour, it can be up to 30 sessions.

Having external beam radiotherapy

Treatment sessions

Usually, each radiotherapy appointment takes about 10 to 30 minutes. But you may be in the department for longer. The treatment itself usually only takes a few minutes. Most of the appointment is spent getting you into the correct position and checking your details.

Before your first treatment, the radiographers explain what you will see and hear. It is normal to feel a bit nervous. But, as you get to know the staff and understand what to expect, it usually feels less worrying. You can talk to the staff about any worries you have.

Positioning you for treatment

Before your treatment, the radiographer may ask you to change into a hospital gown. This is so they can reach the marks made on your skin at your planning appointment (pages 21 to 30). These show the treatment area.

The radiographers help you onto the treatment couch and position you carefully. They also adjust the height and position of the couch and radiotherapy machine. They will talk you through what they are doing.

The radiographers look at the marks on your skin or on your radiotherapy mask or mould, if you have one. This is to help get you in the same position you were in for your planning scan. They help you arrange your clothes or gown so that the area of your body being treated is bare. They are careful to protect your privacy so that nobody else can see you.

It is important that you are comfortable, as you have to lie as still as possible during the treatment. Tell the radiographers if you are not comfortable. The room may be quite dark to help the radiographers while they are getting you into the correct position.

Your radiographers will tell you how long your treatment will take. When you are in the correct position, they leave the room and the treatment starts. The radiographers can see and hear you from outside the room. There is usually an intercom, so you can talk to them if you need to during your treatment.

"The purpose of the mask is to keep you still. The mask is clamped, but not in a horrible way. It's there so you don't move your head."

Jeremy

During treatment

The radiotherapy machine does not usually touch you. But for some types of cancer, it may gently press against your skin.

The treatment itself is not painful. You may hear a slight buzzing noise from the radiotherapy machine while you are having the treatment.

In some treatment rooms you can listen to music. This may help you relax. If you would like to listen to your own music, ask your radiographers if this is possible.

Most curative (radical) radiotherapy involves having treatment from several different directions (page 37). To do this, the radiotherapy machine may move around you into different positions during your radiotherapy. This may happen several times. You will need to lie still. Sometimes, the radiographers will come into the treatment room to change the position of the machine.

The radiotherapy machine may take pictures (x-rays or CT scans) of the treatment area during your treatment. They may be taken on the first day and again on other days. These pictures are used to help make sure the treatment is given accurately. They are not used to show how well treatment is working, as treatment takes time to work.

After treatment

Once your treatment session has finished, the radiographers will come and help you off the treatment couch. It is important to wait until they tell you it is okay to move. Then you can get ready to go home, or back to the ward if you are having treatment as an inpatient.

External beam radiotherapy does not make you radioactive. It is safe for you to be with other people, including children, throughout your treatment. It is also safe to have sex (pages 72 to 73).

Types of external beam radiotherapy

There are different ways of having external radiotherapy. How you have treatment will depend on:

- the type of cancer you have
- the part of the body that is being treated.

Your clinical oncologist or radiographer can tell you more about these treatments and whether they are suitable for you. If a type of radiotherapy is not available at your local hospital, they may arrange for you to have it at another treatment centre.

Conformal radiotherapy

Many types of external beam radiotherapy are conformal. This means the beams are specially shaped to fit the treatment area.

Conformal radiotherapy can be used to treat many different types of cancer.

"When they leave the room, the machine will start up. It is noisy. But you'll get to know the sounds of the machine. And you'll actually know when you're coming to the end of your session. The radiographers are on the other side if you need them. "

Jeremy

Intensity-modulated radiotherapy (IMRT)

IMRT is often used to treat many types of cancer. IMRT shapes the radiotherapy beams and allows different parts of the treatment area to have different doses of radiotherapy. This means the healthy tissue surrounding the tumour has lower doses of radiotherapy. This can help reduce the risk of side effects and late effects. It may also allow the tumour to get higher doses of radiotherapy.

For example, when used for pelvic tumours, IMRT can reduce the risk of long-term bowel problems. It may also reduce damage to the salivary glands and the risk of permanently having a dry mouth when used for head and neck tumours.

Volumetric-modulated arc radiotherapy (VMAT)

VMAT is a newer way of giving IMRT. It is sometimes called RapidArc®. The radiotherapy machine moves around you and reshapes the beam during treatment. This makes it more accurate and shortens the treatment time.

Image-guided radiotherapy (IGRT)

IGRT uses the pictures from scans taken before, and sometimes during, each treatment. The pictures are compared to those taken during the planning scan to check your position and the treatment area.

IGRT is helpful for treating tumours in areas of the body that change shape or position during or between treatment sessions. For example, it may be used to treat the prostate or cervix. These organs can change position if you have a full bladder or bowel on the day of your treatment. IGRT means the radiographers can adjust the treatment area before each treatment. This makes the radiotherapy very precise.

4-dimensional (4D) radiotherapy

4D radiotherapy uses a radiotherapy machine that takes pictures during your treatment. The pictures show any movement of the tumour. Radiographers give the treatment when the tumour is in the correct position in the treatment area. It is sometimes called gating.

4D radiotherapy is helpful for treating tumours in areas of the body that move during treatment. For example, these could be tumours in the lung that move as you breathe. The radiotherapy team use the information from the pictures to adjust the radiotherapy treatment area during treatment.

There are other ways to help reduce movement in the treatment area. Your radiographer may show you some breathing techniques. Or they may use gentle compression on your tummy area, depending on where you are having treatment. They will do this during planning and treatment. It helps to reduce movement in the area being treated. This allows them to treat the area more accurately.

Stereotactic radiotherapy

Stereotactic radiotherapy uses many small, focused beams of radiation. The beams are directed from different angles that meet at the tumour. This makes it very precise. It means very small areas of the body can get high doses of radiotherapy. This can reduce the risk of side effects (pages 60 to 71). VMAT can also be used to give stereotactic radiotherapy. This means that the radiotherapy machine moves around you and reshapes the beam during treatment.

Stereotactic radiotherapy is used to treat different types of tumours. You may be offered this treatment as part of a clinical trial (page 19).

This treatment may not be available in all radiotherapy centres. Your radiotherapy team will give you more information if this treatment is suitable for the type of cancer you have.

Total body irradiation (TBI)

TBI treatment is when a large single dose of radiation, or 6 to 8 smaller doses, is given to the whole body. This type of radiotherapy is not used very often. People who are having a stem cell transplant sometimes have it. We have more information in our booklets **Understanding stem cell transplants using donor cells (allogeneic)** and **Understanding stem cell transplants using your own cells (autologous)** – page 88.

Proton beam therapy

Proton beam therapy uses proton radiation rather than x-rays to destroy cancer cells. Proton beams stop when they reach the area being treated. This is different to standard radiotherapy beams, which pass through the area and some healthy tissue around it. Using proton beam therapy may help to reduce side effects and the risk of long-term effects.

Proton beam therapy is only suitable for a small number of people with certain types of cancer. It is available at:

- the Clatterbridge Cancer Centre in Wirral, to treat tumours of the eye
- the Christie Hospital in Manchester
- University College Hospital in London.

Some of these centres only recently began doing proton beam therapy. Until these treatment centres are fully operational, a small number of people who need this type of radiation may be able to have it abroad, paid for by the NHS.

Your radiotherapy team will give you more information if proton beam therapy is suitable for you. You may have to travel to a hospital that offers it.

Intraoperative radiotherapy

Intraoperative radiotherapy is when you have a single dose of radiation during surgery to remove a cancer. You have this in the operating theatre. This treatment is still being researched and may only be available in some centres as part of a clinical trial.

It may be an option in some situations. For example, it may be used for some people with early breast cancer who would normally have radiotherapy after surgery.

Electron beam radiotherapy

This treatment uses particles called electrons to give radiotherapy to the skin. It treats cancer on the skin or close to the skin surface. This type of radiotherapy does not travel far into your body. Your doctor will tell you if this is an option for you. We have more information in our booklet **Understanding skin cancer** (page 88).

Internal radiotherapy

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What is internal radiotherapy?

Internal radiotherapy uses a radioactive material that is put inside the body to treat cancer. This is called:

- brachytherapy, when a solid material is used (pages 51 to 55)
- radioisotope or radionuclide therapy, when a liquid is given by mouth or injection (pages 56 to 57).

Your healthcare team can give you more information about these types of radiotherapy.

Brachytherapy

Brachytherapy uses radioactive sources that are put near or inside the tumour. These include:

- seeds
- pellets
- tubes
- plaques
- discs.

The radioactivity only affects tissue that is very close to the source. This means the tumour is treated, but healthy areas around it get much less radiotherapy. Areas of the body that are further away are not affected at all.

The source is left in place to give the correct dose of treatment. Depending on the type of brachytherapy, this may take a few minutes or a few days. Some sources are designed to stay in the body permanently.

Your healthcare team will explain your treatment plan. This may also involve external beam radiotherapy (pages 42 to 47) before or after brachytherapy or other treatments such as chemotherapy, hormonal therapy or targeted therapy.

Brachytherapy is mainly used to treat cancers in the prostate, cervix and womb. It is sometimes used to treat other cancers, such as cancer of the vagina, vulva, oesophagus (gullet), skin and rectum. We have more information about having brachytherapy in our booklets about these cancer types (page 88).

Radiation safety during brachytherapy

Your treatment is planned to give you the amount of radiation needed to treat the cancer safely and effectively. Your healthcare team are also careful to protect people around you from radiation. Safety measures may be slightly different in different hospitals. Your team will explain what to expect.

You may have your treatment and go home on the same day or you may stay in hospital. This depends on the type of brachytherapy you have. During your treatment in hospital you may be looked after in a single treatment room. You may need to be alone in the room at times. Tell your healthcare team if you are worried about this so they can help.

As soon as the source is removed from your body, there is no risk to people around you. You are not radioactive.

For some types of brachytherapy, the source is not removed. This includes permanent seed implants (page 53) or SIRT (page 55). The radiation from each source is absorbed by the area of the body closest to it. It is safe for you to be around most people. As a precaution, you may have to avoid close contact with children or people who are pregnant for a time.

Your healthcare team will explain this and any other safety measures to you. They will give you information about your treatment to carry with you at all times.

Brachytherapy for prostate cancer

There are 2 ways of giving brachytherapy for prostate cancer.

Permanent seed implants

Permanent seed implant treatment is sometimes known as low-dose-rate (LDR) brachytherapy. Small radioactive seeds are put into the prostate under a general anaesthetic or spinal anaesthetic. This is an injection of painkillers into the spine. The seeds are not removed. They are left inside the body permanently to release radiation slowly. The seeds become less radioactive over several months.

High-dose-rate (HDR) brachytherapy

HDR brachytherapy is given under a general or a spinal anaesthetic. This is an injection of painkillers into the spine. Thin tubes are put through the skin and into position in the prostate.

The ends of the tubes outside the body are connected to an HDR treatment machine. The machine sends a radioactive pellet into each tube. It keeps the pellets in the tubes in the prostate for up to an hour to give the treatment. When the treatment has finished, the pellets return to the machine. Sometimes 2 or 3 treatments are given over 24 hours. When all the treatment is finished, the tubes are removed.

We have more information in our booklets **Understanding early (localised) prostate cancer** and **Understanding locally advanced prostate cancer** (page 88).

Brachytherapy for cancers of the cervix, womb, vulva and vagina

Hollow tubes called applicators are placed into the vagina. One end of each tube sits inside the vagina or womb. The other end sits outside the body between the legs. If a tube is placed in the womb you may have a general anaesthetic or a spinal anaesthetic. This is an injection of painkillers into the spine.

The end of the tubes outside the body are connected to a treatment machine. The machine sends a radioactive pellet into each tube. The machine then gives the planned dose of radiation. When the treatment has finished the pellets return to the machine. The actual delivery of treatment will cause no pain or burns.

This type of brachytherapy can be given as:

- high-dose-rate treatment (HDR)
- pulsed-dose-rate treatment (PDR)
- low-dose-rate treatment (LDR).

These methods all work equally well. The type you have depends on the system your hospital uses.

HDR treatment is the most common way of giving brachytherapy to the cervix. It is given over about 10 to 15 minutes. You have several treatments over several days or weeks. If you stay in hospital and your treatments are close together, the tubes may be left in place. They will be removed after your last treatment. If you go home between treatments, the tubes are removed before you leave the hospital.

LDR and PDR treatments take longer. You are usually in hospital for 12 to 24 hours, or sometimes for a few days. The tubes stay in place during this time and are removed after the treatment.

Other cancers and brachytherapy

Plaque brachytherapy

Eye cancer (ocular melanoma) may be treated using a small radioactive disc called a plaque. The plaque is placed near the cancer using a small operation. It is usually done under a general anaesthetic. But sometimes a local anaesthetic is used. The plaque is left in place, usually for 1 to 5 days. You have another small operation to remove it after the treatment.

Brachytherapy using an endoscope

An endoscope is a thin, flexible tube with a camera on the end. It can be used to look inside areas such as the nose, throat, airways or rectum.

An endoscope can be used to look for a tumour. When the tumour is found, the person doing the endoscopy puts a thin tube next to the tumour. A machine then sends radioactive pellets into the tube. It keeps the pellets in the tubes in place to give the treatment. After the treatment the pellets return to the machine.

Your healthcare team will give you more information if you are offered this treatment.

Selective internal radiotherapy treatment (SIRT)

This type of brachytherapy may be used to treat some types of liver cancer. For example, it may be used to treat cancer that spreads to the liver from the bowel. Tiny radioactive beads are injected into the bloodstream. They stick permanently in small blood vessels in and around the liver tumour. The beads give off radiation which damages the cancer cells. We have more information about SIRT on our website. Visit **macmillan.org.uk/SIRT**

Radioisotope therapy

This therapy uses radioactive liquids known as radioisotopes or radionuclides to destroy cancer cells. The liquid can be given:

- by mouth as a drink or capsules
- as an injection into a vein.

Cancer cells take in the radioisotope more than normal cells do. This means they get a higher dose of radioactivity. This eventually destroys the cancer cells.

Your radiotherapy team will tell you how you will have your treatment and any possible side effects.

Radiation safety during radioisotope therapy

Your treatment is planned to give you the amount of radiation needed to treat the cancer safely and effectively. But your healthcare team are careful to protect other people around you from radiation. Safety measures may be slightly different in different hospitals. Your team will explain what to expect.

After treatment, your body fluids are slightly radioactive for a time. Your healthcare team will give you instructions about using the toilet and cleaning up any spilled body fluids safely. You may be advised to avoid close contact with children or people who are pregnant for a time.

If your treatment involves a stay in hospital, you may be cared for in a single treatment room. You may be asked to stay in your room at all times. Tell your team if you are worried about this so they can help.

Your team will tell you any other safety measures you need to follow.

Iodine-131

This is the most common type of radioisotope therapy. It is mainly used to treat some types of thyroid cancer. You usually have it as capsules. We have more information in our booklet **Understanding thyroid cancer** (page 88).

It may also be used to treat other rarer neuroendocrine tumours. In this case you have it as an injection into a vein in the arm. You may have to stay in hospital to have this treatment.

Radium-223

This radioisotope is sometimes used to treat prostate cancer that has spread to the bones. It may be used if hormone therapy alone is no longer controlling the cancer and chemotherapy has already been used or is not a suitable option. You have it as an injection into a vein. You can usually go home soon after having this treatment.

We have more information in our booklet **Understanding advanced (metastatic) prostate cancer** (page 88).

Lutetium – 177

Lutetium-177 is used to treat some neuroendocrine tumours (NETs). It may be used to treat other cancers. You have it as an injection into a vein. You usually stay in hospital for this treatment.

Side effects of radiotherapy

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Possible side effects

Your radiotherapy team plans your treatment carefully to reduce your risk of side effects. But most people have some side effects during or after radiotherapy.

Side effects do not usually happen straight away. They may develop during treatment or in the days or weeks after treatment finishes. Sometimes side effects get worse for a time during and after you have finished radiotherapy before they get better. There may also be a risk of side effects that are long-term or that only start months or years after radiotherapy (page 76).

It is difficult to know exactly how you will react to treatment. Your team will explain what to expect. Always tell them if you have side effects during or after radiotherapy. They can give advice and support to help you cope.

Pages 62 to 71 are about some of the general side effects of radiotherapy. You are unlikely to get all of them. You may also get other side effects that we do not mention here. This can depend on:

- the area of your body being treated
- the type of radiotherapy you have
- other treatments you are also having, such as chemotherapy.

Radiotherapy only affects the area of the body being treated. You may find it helpful to read our information about the type of cancer you have. These have more detail about your treatment and the other possible side effects. You may also find our booklet **Side effects of cancer treatment** helpful (page 88).

We also have more information about side effects that may affect your sex life or fertility on pages 72 to 75.

"I needed to build up my strength and stamina. The physios, the doctors and I set realistic goals and targets. Fatigue and concentration were issues as well as my physical health. I decided to focus on exercise, seeing it as almost another medicine. "

Paul

Tiredness (fatigue)

Radiotherapy can make people feel tired. Tiredness (fatigue) may get worse as treatment goes on. You might be more tired if you have to travel to the hospital every day or if you are having radiotherapy alongside other treatments, such as surgery or chemotherapy. Some people are able to continue with their daily activities. Others may find they need to rest more.

After treatment finishes, you may continue to feel tired for weeks or months. If it does not get better, tell your cancer doctor or specialist nurse.

Some people who have advanced cancer may have external beam radiotherapy to help control symptoms of the cancer. This is called palliative radiotherapy. As well as tiredness, this might also cause some mild aches and pains. This usually gets better over a few days.

Coping with tiredness

Here are some tips for coping with tiredness (fatigue):

- Get plenty of rest.
- Do some gentle exercise, such as going for short walks. This gives you more energy and keeps your muscles working.
- Try to eat a healthy diet and drink plenty of fluids.
- Save some energy to do the things you enjoy.
- Ask for help with everyday tasks, if you have friends or family members who can support you.

You may find our booklet **Coping with fatigue (tiredness)** helpful. You can also listen to this booklet as an audiobook online. Visit **macmillan.org.uk/fatigueaudio** You may also find our booklet **Physical activity and cancer** helpful (page 88).

Problems with eating and drinking

At times during your treatment, you may not feel like eating. Or you may find that your eating habits change. Eating a healthy diet and drinking plenty of fluids is good for your general health. Tell your team if you are finding it difficult to eat.

Radiotherapy to some areas of the body can cause more serious side effects that may make eating and drinking difficult. This includes treatment to your head, neck or oesophagus. Your team may suggest putting a feeding tube into your stomach. You may have one of the following tubes:

- An NG tube – this is passed down the nose and into the stomach.
- A PEG or RIG tube – this tube is passed through the skin and muscle of the tummy (abdomen) and into the stomach during a small operation.

The tube is usually put in before your treatment starts. You usually only need it for a short time. You can be fed through it if you have problems eating or drinking. When you can eat and drink again, it is taken out.

Coping with eating and drinking problems

Tell the radiotherapy team if you are having any problems. They can give you advice. They may be able to arrange for you to talk to the hospital dietitian. The dietitian can monitor your weight and diet more closely. Try having small, nutritious snacks throughout the day rather than large meals. If food seems tasteless, use seasoning or strong-flavoured sauces. It can help to avoid foods that are spicy or very hot in temperature. If your mouth is dry, try sipping water regularly or chewing sugar-free gum. If you are losing weight, add extra energy and protein to your diet. Or ask your radiotherapy team about using food supplements.

Feeling or being sick

Some people find radiotherapy makes them feel sick (nausea) or be sick (vomit). This is more likely if the treatment area is near the stomach or the brain. Sickness can usually be well controlled and stops once treatment is finished. Your healthcare team may give you anti-sickness drugs to prevent nausea or vomiting.

Coping with feeling or being sick

Always tell your radiotherapy team if you have nausea or vomiting during or after your treatment. They can give you anti-sickness drugs or change the drugs you are taking. They will explain when and how to take the drugs. These drugs often work better when you take them regularly, or before you start to feel sick. Tell your team if the sickness does not get better.

Ask for help with cooking and preparing meals, if you have friends or family members who can do this for you. This may help especially if the smell of cooking makes you feel sick.

Sipping drinks slowly, drinking ginger tea, or eating ginger biscuits may also help.

Skin reactions

External beam radiotherapy can cause a skin reaction in the area being treated. If this happens, it usually gets worse during and after treatment. It is usually at its worst 10 to 14 days after treatment has finished.

You may find your skin in the treatment area becomes red or darkens. It may also feel sore or itchy. Sometimes the skin gets very sore and it may blister, break or leak fluid.

Very rarely, your radiotherapy team may stop treatment for a short time to allow a serious skin reaction to recover.

Skin reactions can take time to improve. They are usually better about 4 to 6 weeks after your treatment has finished. The area of skin may always look or feel slightly different to the surrounding skin. This can be difficult to cope with. If you are worried talk to your radiotherapy team. There may be ways to help.

We have more information about feeling or being sick, and about skin care on our website.
Visit **macmillan.org.uk/cancer-information-and-support/impacts-of-cancer**

Coping with skin reactions

During your treatment, you are usually advised to:

- wear loose-fitting clothes made from natural fibres, such as cotton
- wash your skin gently with soap and water and gently pat it dry
- avoid rubbing the skin
- avoid very hot things, for example heating pads
- avoid cooling pads, but these may be helpful in some situations so speak to your team about using these first
- avoid wet shaving
- avoid hair-removing creams or products, including wax and laser treatment
- follow your radiotherapy team's advice about using moisturisers and deodorants
- protect the treated area from the sun – your radiographer can give you more information about this.

If your skin becomes sore or itchy or changes colour, tell your radiotherapy team as soon as possible. They can give you advice and treatments if needed.

When you finish radiotherapy, you should protect the skin in the treated area from strong sunshine. Once any skin reaction has disappeared, use a suncream with a high SPF of at least 50. Wear close-weave clothing and a wide-brimmed hat to protect your head and neck area. Remember, you can burn through clothing if you are out in hot sun for a long time. Your radiographer can give you more information about this.

You may be able to go swimming once any skin reaction has disappeared. Your radiographer can give you information when it is safe to go swimming after radiotherapy. Remember to use a waterproof suncream if you swim outdoors.

"I spoke to the Macmillan Support Line because I was having trouble with my treatment. They gave me some advice. It was comforting knowing you could pick up the phone and someone would be there to support you. They can refer you to very practical services."

Jamal

Hair loss

Radiotherapy only causes hair loss in the treatment area. You may lose your hair where the radiation beam leaves the body as well as where it enters the body. Ask your cancer doctor or radiographer to show you exactly where your hair is likely to fall out.

Hair may start to fall out 2 or 3 weeks into radiotherapy treatment. It usually grows back after treatment finishes. Sometimes it grows back a different texture or colour than before. It may take several months to grow back, depending on the dose of radiotherapy you have.

Rarely, hair does not grow back or is patchy. Your doctor or radiographer can tell you if this is likely with your treatment.

Coping with hair loss

If you are worried about losing the hair on your head, it may help to read our information about coping with hair loss. This includes tips to help you prepare if you are likely to lose your hair. Your team can give you information about getting a wig.

We have information about hair loss on our website, and in our booklet **Coping with hair loss** (page 88).

Changes in your blood

Some treatments can reduce the number of normal blood cells produced by your bone marrow. Bone marrow is the spongy part inside some bones. Treatments that impact blood cells include some types of radioisotope therapy (pages 56 to 57). Sometimes, it can also happen with external beam radiotherapy, especially if you have chemotherapy at the same time.

Your blood cell levels are unlikely to cause problems. They will also improve after your treatment finishes. But some people need treatment if the level of certain types of blood cells is too low.

Your team will arrange any blood tests you need during and after your treatment. Always tell your team if you have any bruising or bleeding that you cannot explain. This includes:

- nosebleeds
- bleeding gums
- heavy periods
- blood in your urine (pee) or stools (poo)
- tiny red or purple spots on the skin that may look like a rash.

You should also contact them straight away if:

- your temperature goes over 37.5°C (99.5°F) or below 36°C (96.8°F)
- you suddenly feel unwell, even with a normal temperature
- you have symptoms of an infection.

Symptoms of an infection include:

- feeling shivery and shaking
- a sore throat
- a cough
- breathlessness
- diarrhoea
- needing to pass urine (pee) a lot, or discomfort when you pass urine.

Effects on your sex life

Sex during radiotherapy

During and after external radiotherapy, it is usually safe for you and a partner to have sex. For some types of internal radiotherapy, there may be times during and after treatment when you should avoid having sex or close physical contact. Your team will explain more.

If you have any type of radiotherapy, you should use contraception to:

- prevent pregnancy during radiotherapy and for a time after
- protect yourself from infection.

There are many different types of contraception. Ask your team for advice about the safest type to use during your treatment.

Side effects and sex

Side effects of radiotherapy to any part of the body can change how you feel about having sex. You can find more information about how radiotherapy may affect your sex life in our information about your cancer type.

It is normal to be less interested in sex if you are tired, unwell or anxious. Changes such as weight loss, hair loss or skin reactions may change how you feel about your body or make you feel less confident.

It may help to remember that most of these side effects are usually short-term and get better after you finish radiotherapy. Although it can be upsetting to lose interest in sex, things usually improve as the side effects get better.

Radiotherapy to the pelvic area can cause side effects that may make having sex difficult. The pelvis is the area between the hips in the lower part of the tummy. Sometimes these effects can be long-term or happen months or years after radiotherapy. These are called late effects. Before you decide to have treatment, your team will tell you what side effects are likely.

We have information about pelvic radiotherapy and how it affects your sex life in our booklet **Understanding pelvic radiotherapy**.

If you are in a relationship, try to be honest about how you feel. If cancer or treatment has changed how you feel about your body or about sex, tell your partner. This gives them the chance to understand and support you. They may also have questions to ask you. Try to listen to, and answer, each other's questions and concerns.

Coping with effects on your sex life

If you find a side effect difficult to cope with during or after radiotherapy, talk to your healthcare team. You may feel embarrassed talking about it, but your team is used to talking about these things. They can help. They may be able to give you information or support to cope with a problem. Sometimes they can arrange for you to see other professionals, for example a specialist doctor or counsellor.

We have more information about cancer and your sex life in our booklet **Cancer and your sex life**. You can also find information and support about sex on the College of Sexual and Relationship Therapists website. Visit **cosrt.org.uk** If you want to talk to a cancer information nurse, call us on **0808 808 00 00**.

You can order our booklets and leaflets for free.
Visit **be.macmillan.org.uk** or call us on **0808 808 00 00**.

Effects on fertility

Radiotherapy to most areas of the body does not affect your ability to get pregnant or make someone pregnant. This is called your fertility.

But your fertility may be affected if you have treatment to:

- the pelvic area – the area between the hips in the lower part of the tummy
- the pituitary gland – a small gland at the base of the brain.

Radiotherapy to these areas can affect how your body produces the:

- hormones (chemical messengers) needed to control sex
- egg or sperm cells needed to start a pregnancy.

It can also cause physical changes that:

- make it difficult to get an erection or ejaculate
- mean you cannot get pregnant or carry a pregnancy.

Before you decide to have treatment, your team will explain any risks to your fertility. For some people, radiotherapy causes changes that get better with time. For others, the treatment they have to the pelvic area or pituitary gland causes permanent infertility.

Your team may talk to you about fertility preservation, if this is possible for you. This can mean collecting and freezing sperm or eggs. Sometimes collected eggs can be fertilised with sperm. If suitable embryos develop, these may be frozen.

Fertility preservation is not always possible. But it may mean some people who lose their fertility are still able to have a baby in the future.

Preventing pregnancy

Even if your team tell you your fertility might be affected by the treatment, it is not always possible to know when this will happen. You may still be able to get pregnant or make someone pregnant.

You should use contraception to prevent a pregnancy during your radiotherapy and for a time after. Your team can give you more information about this.

Coping with infertility

People cope with the idea of infertility in different ways. You may come to terms with it quickly and feel that dealing with the cancer is more important. Or you might find that the impact does not hit you until treatment is over.

Whatever you are feeling, there is support if you want to talk or have questions. It does not matter whether you are starting cancer treatment or had treatment in the past. You may find it helps to talk with your partner, family, friends, or religious or spiritual adviser. If you want to talk to a counsellor, your GP or cancer doctor can help to arrange this. Fertility clinics also provide counselling.

Organisations such as the British Infertility Counselling Association (BICA) can offer support and counselling to people affected by infertility. Visit **bica.net** Talking to other people in a similar position may also help you feel less alone. Get in touch with our Online Community at **macmillan.org.uk/community**

We have more information about effects on fertility in our booklets **Cancer and fertility – information for women** and **Cancer and fertility – information for men** (page 88).

Late and long-term side effects

Radiotherapy is carefully planned and treatments are becoming more and more accurate. This allows your team to treat the cancer while doing as little damage as possible to other parts of the body.

But there may still be a risk you will have side effects that:

- do not get better after treatment – these are called long-term side effects
- only start months or years later – these are called late effects.

This risk may be higher if you are also having other treatments, such as chemotherapy.

Before you decide to have cancer treatment, your team will explain your risk of developing these side effects. Even if it is not very likely, it is important that you understand and think about these long-term risks.

You can find more about possible long-term effects of radiotherapy in our information about the type of cancer you have. We have information booklets on a range of cancer types.

We also have information on our website and in the following booklets:

- **Managing the late effects of bowel cancer treatment**
- **Managing the late effects of breast cancer treatment**
- **Managing the late effects of head and neck cancer treatment**
- **Managing the bowel late effects of pelvic radiotherapy**
- **Managing the bladder late effects of pelvic radiotherapy**.

Second cancers

Radiotherapy may increase your risk of developing a different type of cancer later in life. A very small number of people develop another cancer because of the treatment they had.

The chance of a second cancer is small. This risk is far less than the benefits of treating the first cancer with radiotherapy.

If you are worried about your risk of developing a second cancer, talk to your cancer doctor.

You can order our booklets and leaflets for free.
Visit **be.macmillan.org.uk** or call us on **0808 808 00 00**.

Life after radiotherapy

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Follow-up

After your radiotherapy has finished, your cancer doctor or radiographer will talk to you about what will happen next. Your follow up depends on:

- the type of cancer
- the type of radiotherapy.

Your follow-up care may involve one of the following:

- You may not need follow-up appointments. Instead, you might get advice about problems you should be aware of and the details of someone to contact if you need to.
- You might have regular follow-up appointments at the radiotherapy department or your original hospital. This may be in person, by telephone or video link. These may be with the specialist who recommended the radiotherapy. The first appointment is usually 4 to 8 weeks after treatment has finished.
- A nurse or radiographer may follow-up by telephone. They will check how you are by asking you questions. If needed, they will arrange for you to have an appointment at the clinic.
- You may do patient-led follow-up. This means you do not have set appointments but can contact the team and arrange one if you are worried. This may not be suitable for everyone.

As part of your follow-up you may have blood tests, other tests or scans. The tests and scans you have depend on the type of cancer and treatment you have had. Your cancer doctor will tell you more about this.

Follow-up appointments are a good opportunity to talk about any problems or worries you have. It may help to make a list of questions before you go, so you do not forget anything. You may be able to take a friend or family member with you.

Contact your clinical nurse specialist, cancer doctor or the person you have been told to contact if you:

- have any problems
- notice any new symptoms at any time.

Do not wait until your next appointment, just ask for an earlier one.

Well-being and recovery

You may have mixed emotions when you get to the end of your radiotherapy treatment. You will probably feel relieved, but you may also feel anxious and uncertain. Some people find they feel low after finishing the treatment. It can take time to rebuild your confidence and accept what you have been through.

It may also take time to recover from treatment. You may feel tired for a while and might have emotional changes or side effects to deal with. It is important to give yourself time to recover and adjust. If you are worried about anything, you can:

- talk to your radiotherapy team
- ask your healthcare team for the details of local support groups that may be able to help
- call us on **0808 808 00 00** to talk to one of our cancer support specialists.

"You can access the Online Community 24/7, 365 a year. It makes no difference what time of day it is, someone will be there. People often use it during the night – when you can't sleep and the noise is buzzing around your head. It's good for people to unload."

Mike

Lifestyle changes

When your treatment is over, you may choose to make lifestyle changes to improve your health and well-being. Even if you had a healthy lifestyle before cancer, you may be more focused on making the most of your health. There are things you can do to help your body recover. These can also help improve your sense of well-being and lower your risk of getting other illnesses and other cancers.

Eat well

It is important to eat a well-balanced diet with plenty of fresh fruit and vegetables. You should try to do this even if you have less of an appetite or are less interested in food. If you have problems with eating and drinking we have more information in our booklets **Eating problems and cancer** and **Healthy eating and cancer** (page 88).

Stop smoking

If you smoke, it is important to try to stop. Smoking can delay your recovery and increase your risk of developing a second cancer. Giving up smoking can be difficult, but there is a lot of support available. Check the NHS website for the country where you live (page 95).

Be physically active

Physical activity can be an important part of your recovery after treatment. It can:

- help you feel better in yourself
- reduce stress and tiredness
- reduce the risk of heart disease, stroke and diabetes.

Talk to your cancer specialist or GP before you start exercising. Start slowly and increase your activity over time.

Complementary therapies

Complementary therapies may:

- help you feel better
- reduce stress and anxiety.

Relaxation, counselling and psychological support are available at some hospitals. Some hospitals also offer visualisation, massage, reflexology, aromatherapy and hypnotherapy.

Therapies are sometimes available through cancer support groups or your GP. Many complementary therapists have private practices.

Not all complementary therapies are suitable for people having, or who have just finished having, radiotherapy. It is important to check with your cancer doctor first if you are thinking of having one.

We have more information in our booklet **Cancer and complementary therapies** (page 88).

Further information

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About our information

We provide expert, up-to-date information about cancer. And all our information is free for everyone.

Order what you need

You may want to order more booklets or leaflets like this one. Visit **be.macmillan.org.uk** or call us on **0808 808 00 00**.

We have booklets about different cancer types, treatments and side effects. We also have information about work, financial issues, diet, life after cancer treatment and information for carers, family and friends.

Online information

All our information is also available online at **macmillan.org.uk/information-and-support** You can also find videos featuring stories from people affected by cancer, and information from health and social care professionals.

Other formats

We also provide information in different languages and formats, including:

- audiobooks
- Braille
- British Sign Language
- easy read booklets
- eBooks
- large print
- translations.

Find out more at **macmillan.org.uk/otherformats** If you would like us to produce information in a different format for you, email us at **cancerinformationteam@macmillan.org.uk** or call us on **0808 808 00 00**.

If you would like to talk to someone in a language other than English, we also offer an interpreter service for our Macmillan Support Line. Call **0808 808 00 00** and say, in English, the language you want to use. Or send us a web chat message saying you would like an interpreter. Let us know the language you need and we'll arrange for an interpreter to contact you.

Information centres

Our information and support centres are based in hospitals, libraries and mobile centres. Visit one to get the information you need and speak with someone face to face. If you would like a private chat, most centres have a room where you can speak with someone confidentially.

Find your nearest centre at **macmillan.org.uk/informationcentres** or call us on **0808 808 00 00**.

Help with money worries

Having cancer can bring extra costs such as hospital parking, travel fares and higher heating bills. If you have been affected in this way, we can help.

Financial guidance

Our financial team can give you guidance on mortgages, pensions, insurance, borrowing and savings.

Help accessing benefits

Our welfare rights advisers can help you find out what benefits you might be entitled to, and help you complete forms and apply for benefits. They can also tell you more about other financial help that may be available to you. We can also tell you about benefits advisers in your area. Visit **macmillan.org.uk/financialsupport** to find out more about how we can help you with your finances.

Other ways we can help you

At Macmillan, we know how a cancer diagnosis can affect everything, and we are here to support you.

Talk to us

If you or someone you know is affected by cancer, talking about how you feel and sharing your concerns can really help.

Macmillan Support Line

Our free, confidential phone line is open 7 days a week, 8am to 8pm. We can:

- help with any medical questions you have about cancer or your treatment
- help you access benefits and give you financial guidance
- be there to listen if you need someone to talk to
- tell you about services that can help you in your area.

Our trained cancer information advisers can listen and signpost you to further support. Call us on **0808 808 00 00**. We are open 7 days a week, 8am to 8pm.

You can also email us, or use the Macmillan Chat Service via our website. You can use the chat service to ask our advisers about anything that is worrying you. Tell them what you would like to talk about so they can direct your chat to the right person. Click on the 'Chat to us' button, which appears on pages across the website. Or go to **macmillan.org.uk/talktous**

Talk to others

No one knows more about the impact cancer can have on your life than those who have been through it themselves. That is why we help bring people together in their communities and online.

Support groups

Whether you are someone living with cancer or a carer, family member or friend, we can help you find support in your local area, so you can speak face to face with people who understand. Find out about support groups in your area by calling us or by visiting **macmillan.org.uk/selfhelpandsupport**

Online Community

Thousands of people use our Online Community to make friends, blog about their experiences and join groups to meet other people going through the same things. You can access it any time of day or night. Share your experiences, ask questions, or just read through people's posts at **macmillan.org.uk/community**

You can also use our Ask an Expert service on the Online Community. You can ask a financial guide, cancer information nurse, work support advisor or an information and support advisor any questions you have.

Macmillan healthcare professionals

Our nurses, doctors and other health and social care professionals give expert care and support to individuals and their families. Call us or ask your GP, consultant, district nurse or hospital ward sister if there are any Macmillan professionals near you.

Other useful organisations

There are lots of other organisations that can give you information or support. Details correct at time of printing.

Radiotherapy organisations

Society of Radiographers

Tel **0207 740 7200**
www.sor.org
This organisation is for professionals, but it also provides information about radiotherapy for the public. You can access some of the national guidance documents for radiotherapy from the website.

General cancer support organisations

Cancer Black Care

Tel **0208 961 4151**
www.cancerblackcare.org.uk
Offers UK-wide information and support for people from Black and ethnic minority communities who have cancer. Also supports their friends, carers and families.

Cancer Focus Northern Ireland

Helpline **0800 783 3339**
www.cancerfocusni.org
Offers a variety of services to people affected by cancer in Northern Ireland.

Cancer Research UK

Helpline **0808 800 4040**
www.cancerresearchuk.org
A UK-wide organisation that has patient information on all types of cancer. Also has a clinical trials database.

Cancer Support Scotland

Tel **0800 652 4531**
www.cancersupportscotland.org
Runs cancer support groups throughout Scotland. Also offers free complementary therapies and counselling to anyone affected by cancer.

Macmillan Cancer Voices

www.macmillan.org.uk/cancervoices
A UK-wide network that enables people who have or have had cancer, and those close to them such as family and carers, to speak out about their experience of cancer.

Maggie's

Tel **0300 123 1801**
www.maggies.org
Has a network of centres in many locations throughout the UK. Provides free information about cancer and financial benefits. Also offers emotional and social support to people with cancer, their family, and friends.

Penny Brohn UK

Helpline **0303 3000 118**
www.pennybrohn.org.uk
Offers physical, emotional and spiritual support across the UK, using complementary therapies and self-help techniques.

Riprap

www.riprap.org.uk
Developed especially for teenagers in the UK who have a parent with cancer. Has an online forum where teenagers going through similar experiences can talk to each other for support.

Tenovus

Helpline **0808 808 1010**
www.tenovuscancercare.org.uk
Aims to help everyone in the UK get equal access to cancer treatment and support. Funds research and provides support such as mobile cancer support units, a free helpline, benefits advice and an online 'Ask the nurse' service.

General health information

Health and Social Care in Northern Ireland

www.northerntrust.hscni.net
Provides information about health and social care services in Northern Ireland.

NHS.UK

www.nhs.uk
The UK's biggest health information website. Has service information for England.

NHS 111 Wales

111.wales.nhs.uk
NHS health information site for Wales.

NHS Inform

Helpline **0800 22 44 88**
www.nhsinform.scot
NHS health information site for Scotland.

Patient UK

www.patient.info
Provides people in the UK with information about health and disease. Includes evidence-based information leaflets on a wide variety of medical and health topics. Also reviews and links to many health- and illness-related websites.

Support with stopping smoking

NHS smoking helpline

www.nhs.uk/smokefree/help-and-advice/support
Offers free information, advice and support to people who are giving up smoking, and those who have given up and do not want to start again.

Counselling

British Association for Counselling and Psychotherapy (BACP)

Tel **0145 588 3300**
www.bacp.co.uk
Promotes awareness of counselling and signposts people to appropriate services across the UK. You can also search for a qualified counsellor on their 'How to find a therapist' page.

UK Council for Psychotherapy (UKCP)

Tel **0207 7014 9955**
www.psychotherapy.org.uk
Holds the national register of psychotherapists and psychotherapeutic counsellors, listing practitioners who meet exacting standards and training requirements.

Emotional and mental health support

Mind

Helpline **0300 123 3393**
www.mind.org.uk
Provides information, advice and support to anyone with a mental health problem through its helpline and website.

Samaritans

Helpline **116 123**
Email **jo@samaritans.org**
www.samaritans.org
Provides confidential and non-judgemental emotional support, 24 hours a day, 365 days a year, for people experiencing feelings of distress or despair.

Financial support or legal advice and information

Advice NI

Helpline **0800 915 4604**
Provides advice on a variety of issues including financial, legal, housing and employment issues.

Benefit Enquiry Line Northern Ireland

Helpline **0800 232 1271**
Textphone **028 9031 1092**
www.nidirect.gov.uk/money-tax-and-benefits
Provides information and advice about disability benefits and carers' benefits in Northern Ireland.

Carer's Allowance Unit

Tel **0800 731 0297**
Textphone 0**800 731 0317**
www.gov.uk/carers-allowance
Manages state benefits in England, Scotland and Wales. You can apply for benefits and find information online or through its helplines.

Citizens Advice

Provides advice on a variety of issues including financial, legal, housing and employment issues. Use their online webchat or find details for your local office by contacting:

England

Helpline **0800 144 8848**
www.citizensadvice.org.uk

Scotland

Helpline **0800 028 1456**
www.cas.org.uk

Wales

Helpline **0800 702 2020**
www.citizensadvice.org.uk/wales

GOV.UK

www.gov.uk
Has information about social security benefits and public services in England, Scotland and Wales.

Macmillan Benefits Advice Service (Northern Ireland)

Tel **0300 1233 233**

Money Advice Scotland

Tel **0141 572 0237**
www.moneyadvicescotland.org.uk
Use the website to find qualified financial advisers in Scotland.

NiDirect

www.nidirect.gov.uk
Has information about benefits and public services in Northern Ireland.

StepChange Debt Charity

Tel **0800 138 1111**
www.stepchange.org
Provides free debt advice through phone, email, the website and online through live chats with advisers.

Unbiased.co.uk

Helpline **0800 023 6868**
www.unbiased.co.uk
You can search the website for qualified advisers in the UK who can give expert advice about finances, mortgages, accounting or legal issues.

Support for young people

Young Lives vs Cancer

Tel **0300 330 0803**
www.younglivesvscancer.org.uk
Provides clinical, practical, financial and emotional support to children with cancer and their families in the UK.

Teenage Cancer Trust

Tel **0207 612 0370**
www.teenagecancertrust.org
A UK-wide charity devoted to improving the lives of teenagers and young adults with cancer. Runs a support network for young people with cancer, their friends and families.

Youth Access

Tel **0208 772 9900**
www.youthaccess.org.uk
A UK-wide organisation providing counselling and information for young people. Find your local service by visiting **youthaccess.org.uk/find-your-local-service**

Support for older people

Age UK

Helpline **0800 678 1602**
www.ageuk.org.uk
Provides information and advice for older people across the UK via the website and advice line. Also publishes impartial and informative fact sheets and advice guides.

LGBT-specific support

LGBT Foundation

Tel **0345 330 3030**
www.lgbt.foundation
Provides a range of services to the LGBT community, including a helpline, email advice and counselling. The website has information on various topics including sexual health, relationships, mental health, community groups and events.

Live Through This

www.livethroughthis.co.uk
A safe space for anybody who identifies as part of the queer spectrum and has had an experience with any kind of cancer at any stage. Also produces resources about LGBT cancer experiences. LTT runs a peer support group with Maggie's Barts.

Support for carers

Carers Trust

Tel **0300 772 9600**
www.carers.org
Provides support, information, advice and services for people caring at home for a family member or friend. You can find details for UK offices and search for local support on the website.

Carers UK

Helpline (England, Scotland, Wales) **0808 808 7777**
Helpline (Northern Ireland) **028 9043 9843**
www.carersuk.org
Offers information and support to carers across the UK. Has an online forum and can put people in contact with local support groups for carers.

Cancer registries

The cancer registry

A national database that collects information on cancer diagnoses and treatment. This information helps the NHS and other organisations plan and improve health and care services. There is one in each country in the UK:

National Cancer Registration and Analysis Service

Tel **0207 654 8000**
www.ndrs.nhs.uk
Tel (Ireland) **0214 318 014**
www.ncri.ie (Ireland)

Scottish Cancer Registry

www.ndrs.nhs.uk/cancer-registration-your-rights-and-privacy

Welsh Cancer Intelligence and Surveillance Unit (WCISU)

Tel **0292 010 4278**
phw.nhs.wales/services-and-teams/welsh-cancer-intelligence-and-surveillance-unit-wcisu

Northern Ireland Cancer Registry

Tel **0289 097 6028**
www.qub.ac.uk/nicr

Your notes and questions

Disclaimer

We make every effort to ensure that the information we provide is accurate and up to date but it should not be relied upon as a substitute for specialist professional advice tailored to your situation. So far as is permitted by law, Macmillan does not accept liability in relation to the use of any information contained in this publication, or third-party information or websites included or referred to in it. Some photos are of models.

Thanks

This booklet has been written, revised and edited by Macmillan Cancer Support's Cancer Information Development team. It has been approved by our Senior Medical Editor, David Gilligan, Consultant Clinical Oncologist.

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We're grateful to the staff at Swindon Radiotherapy Centre Great Western Hospital for enabling us to do a photoshoot there.

We welcome feedback on our information. If you have any, please contact **cancerinformationteam@macmillan.org.uk**

Sources

Below is a sample of the sources used in our radiotherapy information. If you would like more information about the sources we use, please contact us at **cancerinformationteam@macmillan.org.uk**

National Institute for Health and Care Excellence (NICE). www.nice.org [accessed October 2021]

The Royal College of Radiologists. Radiotherapy dose fractionation. 3rd Edition. 2019.

Society and College of Radiographers. Practice guideline document. Radiation dermatitis guidelines for radiotherapy healthcare professionals. 2nd Edition. 2020.

Can you do something to help?

We hope this booklet has been useful to you. It is just one of our many publications that are available free to anyone affected by cancer. They are produced by our cancer information specialists who, along with our nurses, benefits advisers, campaigners and volunteers, are part of the Macmillan team. When people are facing the toughest fight of their lives, we are here to support them every step of the way.

We want to make sure no one has to go through cancer alone, so we need more people to help us. When the time is right for you, here are some ways in which you can become a part of our team.

5 ways you can help someone with cancer

1. **Share your cancer experience**
   Support people living with cancer by telling your story, online, in the media or face to face.

2. **Campaign for change**
   We need your help to make sure everyone gets the right support. Take an action, big or small, for better cancer care.

3. **Help someone in your community**
   A lift to an appointment. Help with the shopping. Or just a cup of tea and a chat. Could you lend a hand?

4. **Raise money**
   Whatever you like doing you can raise money to help. Take part in one of our events or create your own.

5. **Give money**
   Big or small, every penny helps.
   To make a one-off donation see over.

Please fill in your personal details

Mr/Mrs/Miss/Other

Name

Surname

Address

Postcode

Phone

Email

Please accept my gift of £
(Please delete as appropriate)

I enclose a cheque / postal order / Charity Voucher made payable to Macmillan Cancer Support
OR debit my:
Visa / MasterCard / CAF Charity Card / Switch / Maestro

Card number

Valid from

Expiry date

Issue no

Security number

Signature

Date / /

Do not let the taxman keep your money

Do you pay tax? If so, your gift will be worth 25% more to us – at no extra cost to you. All you have to do is tick the box below, and the tax office will give 25p for every pound you give.

☐ I am a UK tax payer and I would like Macmillan Cancer Support to treat all donations I make or have made to Macmillan Cancer Support in the last 4 years as Gift Aid donations, until I notify you otherwise.

I understand that if I pay less Income Tax and/or Capital Gains Tax than the amount of Gift Aid claimed on all my donations in that tax year it is my responsibility to pay any difference. I understand Macmillan Cancer Support will reclaim 25p of tax on every £1 that I give.

Macmillan Cancer Support and our trading companies would like to hold your details in order to contact you about our fundraising, campaigning and services for people affected by cancer. If you would prefer us not to use your details in this way please tick this box. ☐

In order to carry out our work we may need to pass your details to agents or partners who act on our behalf.

If you would rather donate online go to **macmillan.org.uk/donate**

Registered with FUNDRAISING REGULATOR

Please cut out this form and return it in an envelope (no stamp required) to: Supporter Donations, Macmillan Cancer Support, FREEPOST LON15851, 89 Albert Embankment, London SE1 7UQ

MACMILLAN CANCER SUPPORT

This booklet is about radiotherapy. It is for anyone who is having radiotherapy or has been offered it as part of their treatment. It is also helpful if you are a carer, family member or friend.

The booklet explains what radiotherapy is, how it is given and possible side effects. It also has information about ways to cope with side effects.

At Macmillan, we give people with cancer everything we've got. If you are diagnosed, your worries are our worries. We will help you live life as fully as you can.

For information, support or just someone to talk to, call **0808 808 00 00** or visit **macmillan.org.uk**

Would you prefer to speak to us in another language? Interpreters are available. Please tell us in English the language you would like to use. Are you deaf or hard of hearing? Call us using NGT (Text Relay) on **18001 0808 808 00 00**, or use the NGT Lite app.

Need information in different languages or formats? We produce information in audio, eBooks, easy read, Braille, large print and translations. To order these, visit **macmillan.org.uk/otherformats** or call our support line.

Trusted Information Creator
Patient Information Forum