Radiotherapy for lymphoma

This information is about radiotherapy for lymphoma. It aims to answer the questions people often ask about this type of treatment:

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What is radiotherapy?

Radiotherapy is a treatment that uses radiation (in the form of high-energy X-rays) to destroy cancer cells. It has been used successfully to treat lymphoma for over 50 years.

How does radiotherapy work?

Radiotherapy gives radiation to one or two precise areas of the body. This is different from chemotherapy, which travels through the body in the bloodstream.

You can read about chemotherapy on our website at www.lymphomas.org.uk. You can also print this information at home or, if you prefer, our helpline can send you a copy – email information@lymphomas.org.uk or ring 0808 808 5555.
Lymphoma develops when lymphocytes (specialised white blood cells) grow out of control and build up in the lymph nodes and other organs. This happens when lymphocytes divide more often than normal and/or they do not die off when they should.

The high-energy rays used in radiotherapy damage cells so that they can no longer divide. Radiotherapy does more damage to cancer cells than it does to healthy cells. Healthy cells can usually repair themselves, whereas cancer cells cannot and they die off.

Why is radiotherapy used to treat lymphoma?

Lymphoma cells are very sensitive to radiation – more so than most other types of cancer cells, such as breast or lung cancer cells. This makes radiotherapy an effective treatment for lymphoma.

What is the aim of radiotherapy – will it cure my lymphoma?

Some types of lymphoma, especially if they are at an early stage, can be cured by radiotherapy. Radiotherapy given with the aim of destroying all of the lymphoma is called ‘curative radiotherapy’. For a few people, radiotherapy is the only treatment that is needed. This is most likely with lymphomas that are low grade or ‘indolent’ (slow-growing).

Sometimes, radiotherapy is given to control symptoms (eg pain or breathlessness). It helps by reducing the size of the lymphoma. Radiotherapy given with the aim of easing symptoms is called ‘palliative radiotherapy’.

Radiotherapy is usually given after the chemotherapy. Having a combination of chemotherapy and radiotherapy is sometimes called ‘chemoradiotherapy’.

Chemotherapy destroys small clusters of lymphoma cells that are some way away from the enlarged lymph nodes. Radiotherapy is then given to make sure that the lymphoma is completely destroyed. Doctors target the radiation to enlarged nodes and any nearby areas where they think there is lymphoma.

Radiotherapy can help stop lymphoma from relapsing (coming back) after chemotherapy treatment. Research has shown that lymphoma doesn’t usually come back to a part of the body that has already had some radiotherapy.

Which types of lymphoma are treated with radiotherapy?

Radiotherapy is used to treat many different types of lymphoma. It is often used when lymphoma is found in just one or two areas (‘sites’) of the body. It may also be used if there was a large amount of lymphoma in one or two sites before you had chemotherapy.
Radiotherapy for Hodgkin lymphoma

You might be treated with radiotherapy if you have:

- classical Hodgkin lymphoma that is at an early stage – the radiotherapy is usually given after a course of chemotherapy
- advanced Hodgkin lymphoma, if there are very enlarged (‘bulky’) lymph nodes
- nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL) that is at an early stage, when radiotherapy alone is the recommended treatment.

Radiotherapy for non-Hodgkin lymphoma

Radiotherapy is used to treat many types of non-Hodgkin lymphoma. It is most commonly used to treat high-grade or ‘aggressive’ (fast-growing) non-Hodgkin lymphomas such as diffuse large B-cell lymphoma (DLBCL).

Radiotherapy is occasionally given to treat low-grade or ‘indolent’ (slow-growing) non-Hodgkin lymphomas such as follicular lymphoma. In these cases, it is used for lymphomas that have relapsed (come back) but are in just one site (area of the body).

Sometimes, radiotherapy for non-Hodgkin lymphoma is given on its own. This is usually when the lymphoma is at an early stage when it is diagnosed.

Usually, radiotherapy for non-Hodgkin lymphoma is given together with other treatments such as chemotherapy. The chemotherapy is usually given first and the radiotherapy afterwards.

We have more information about the different types of lymphoma, which you can read on our website at www.lymphomas.org.uk. You can also print this information at home or, if you prefer, our helpline can send you copies – email information@lymphomas.org.uk or ring 0808 808 555.

Types of radiotherapy

Most people having radiotherapy for lymphoma will have one of the following:

- **Involved-field radiotherapy (IFRT)** to treat a whole lymph node area, such as the neck or groin. Another version of IFRT is ‘involved-site radiotherapy’, where the radiation is targeted to a smaller area. IFRT is usually given when radiotherapy is the only or the main part of treatment.

- **Involved-node radiotherapy (INRT)** to treat just the affected lymph nodes and a small area (margin) around them. INRT may be given after a full course of chemotherapy.

The radiotherapy you have will depend on the type of lymphoma you have and the aim of the radiotherapy.
Where will I have radiotherapy?

You will need to go to the hospital for your treatment to be planned and each time you are given radiotherapy.

Radiotherapy is normally given daily over 2–4 weeks. Typically, you have treatment from Monday to Friday with a break at the weekends. Don’t worry if your schedule is different from this – your treatment plan is individually made for you, and your medical team will talk you through it beforehand. Having more treatment than someone else doesn’t mean that your lymphoma is more serious than theirs.

Not all hospitals have a radiotherapy department. This is because the equipment is very expensive and needs to be housed in a specialised treatment room. The radiotherapy staff members are also highly specialised.

How much radiotherapy will I need?

Your radiotherapy plan is tailor-made for you. Highly trained specialists calculate the right dose of radiation.

The total dose (measured in ‘Gray’) is split into a number of separate treatments or ‘fractions’. One reason treatment sessions are spread out is to give healthy cells a chance to repair themselves between treatments. ‘Fractionation’ also increases the likelihood of capturing the cancer cells at a time when they are most sensitive to irradiation.

With modern imaging techniques, it is now possible to use a much lower total dose of radiotherapy and to target the lymphoma much more accurately than was possible in the past. This reduces the side effects caused by radiation to healthy cells while still treating the lymphoma successfully.

Radiotherapy planning

Radiotherapy needs to be carefully planned to make it is as effective as possible and to minimise side effects.

When you and your medical team have decided on radiotherapy, you will be under the care of a clinical oncologist (a doctor who specialises in the treatment of cancer). Your clinical oncologist will keep close checks on you throughout your treatment.
During planning, the radiotherapy team will make sure that the right amount of radiotherapy is delivered to precisely the right place. They look at:

- exactly where the lymphoma is – this area will receive the maximum amount of radiotherapy
- the area around the lymphoma – this area may receive a smaller amount of radiotherapy if there is a risk that some lymphoma cells have spread there
- organs at risk (OAR) – these organs are critical structures in the body (eg the brain, heart, and salivary glands); your radiotherapy will be planned so that any of these organs receive only a very low amount of radiotherapy or, if possible, none at all. This protects them from damage.

The rest of your body will not receive any radiation, unless you are having total body irradiation (TBI).

**How your radiotherapy is planned**

- You will have a computed tomography (CT) scan (unless your lymphoma is on or near the skin surface).
- A machine called a ‘CT simulator’ uses computed tomography to make a detailed three-dimensional map that shows where the lymphoma is and the exact positions of nearby tissues and organs.
- The information from the simulator is given to ‘dosimetrists’, who specialise in physics and radiation. They use computer software to work out how best to direct the X-ray beams to treat the lymphoma while also keeping radiation to nearby parts of the body low. To help in their planning, dosimetrists work within ‘dose constraints’ (limits of radiation that are known to be safe). The clinical oncologist approves the final radiotherapy plan.
- Marks are made on your skin (unless you are being treated for lymphoma in the head and neck area). Some of these are made using ink, with pens that are like felt-tipped pens. You may also need a few permanent marks (‘tattoos’) – usually two or three tiny dots of ink just under the surface of the skin. When you have your treatment, the marks are lined up with the X-ray beams on the treatment machine to make sure the radiotherapy goes to exactly the right place.
- Before you have radiotherapy, you may have a practice or ‘dummy run’. This allows the radiotherapy team to check the precision of the marks. It also helps you to know what to expect when you go for treatment.

We have more information about CT scans, which you can read on our website at www.lymphomas.org.uk. You can also print this at home or, if you prefer, our helpline can send you a copy – email information@lymphomas.org.uk or ring 0808 808 5555.
Treatment ‘masks’ or ‘shells’ for lymphoma in the head and neck area

If you are having radiotherapy treatment for lymphoma in the head and neck area, you will probably need to have a thin plastic ‘shell’ or ‘mask’ made. The shell helps to get you into the same position each time you have treatment and also helps to keep you still.

The shell is usually made from a sheet of ‘thermoplastic’. The thermoplastic is softened in warm water for a couple of minutes, making it mouldable. The sheet is then gently laid over your face. You’ll need to stay still while it cools and sets into the shape of your face – this doesn’t take long and most people say it doesn’t feel unpleasant.

Once your shell is made, the radiographers will make marks on it to line the radiotherapy beams up with. This is important to ensure that the radiotherapy goes to exactly the right place.

Wearing a shell may seem daunting but most people find it OK, even if they felt nervous beforehand. Holes in the shell allow you to see and breathe easily and staff will try to make you feel as comfortable as possible. If you are worried about wearing the shell, let your medical team know.

What happens during a radiotherapy session?

You will be treated by a therapy radiographer using a ‘linear accelerator’ (or ‘Linac’) machine. This produces high-energy X-ray beams, which deliver an accurate dose of radiation inside the body.

The total time for each treatment session is typically about 10–20 minutes. Most of this time is spent positioning you correctly.

Setting up

- You will be in a linear accelerator room, usually lying down on a couch. Staff will take time to get your positioning exactly right.
- The radiographer might cover some parts of your body that do not need treatment.
- The lights will be dimmed. You will probably notice a beam of light coming from the head of the machine. There will also be some coloured laser beams that come from different points around the room. Laser beams are not harmful in any way. They act as a guide to help the radiographer get you and the machine into the correct position.

Having the radiotherapy

Before switching on the machine, the radiographers will turn the lights on fully and leave the room. They will watch you on closed-circuit television (CCTV). They can see and hear you the whole time, and you will be able to hear them too.
The radiation will be given for only a few minutes. You won’t feel anything, but the machine makes a whirring noise.

You can watch a talk about radiotherapy given by Dr. Robin Prestwich, Consultant Clinical Oncologist, at our 2014 patient and carer conference. This is available on our website at www.lymphomas.org.uk.

**Electron therapy**

Occasionally, a type of radiation therapy called ‘electron therapy’ or ‘electron beam therapy’ might be used. This could be if you have:

- skin lymphoma
- lymphoma in lymph nodes very close to the surface of your skin.

Electrons are tiny particles of radiation that are unable to travel very far in the body. This keeps them near to the skin’s surface.

Electrons are produced by a linear accelerator machine. An attachment called an ‘applicator’ is connected to the head of the machine. This directs the electrons to the site (area of your body) that needs treatment. When the machine is set up, the applicator will be brought very close to you and may even just touch you. You won’t feel anything during the treatment itself though.

We have more information about skin lymphoma, which you can read on our website at www.lymphomas.org.uk. You can also print this information at home or, if you prefer, our helpline can send you copies – email information@lymphomas.org.uk or ring 0808 808 5555.

**Total body irradiation**

Total body irradiation (TBI) is a type of radiotherapy in which radiation is delivered to the whole body. You might have TBI as part of ‘conditioning’ treatment before a stem cell transplant. This helps to destroy your own bone marrow to make room for the healthy new stem cells and stops you rejecting the transplant.

TBI is usually given twice a day for a few days. Your radiotherapy team will talk you through your individual treatment plan.

We have more information about stem cell transplants, which you can read on our website at www.lymphomas.org.uk. You can also print this information at home or, if you prefer, our helpline can send you copies – email information@lymphomas.org.uk or ring 0808 808 5555.
Will radiotherapy make me radioactive?

Radiotherapy will not make you radioactive. People around you are not at any risk after you have had treatment.

How will radiotherapy make me feel?

Most people feel tired or fatigued after radiotherapy. There are a number of side effects you may experience, depending on the area of the body which is treated. Your medical team will advise you on whether they expect you to have side effects from your particular treatment.

We have more information about the side effects of radiotherapy, which you can read on our website at www.lymphomas.org.uk. You can also print this information at home or, if you prefer, our helpline can send you a copy – email information@lymphomas.org.uk or ring 0808 808 5555.

Asking questions about your radiotherapy

Don’t be afraid to ask questions. And don’t worry that your question may seem silly because, whatever it is, you almost certainly won’t be the first to ask. Even if you think someone has already explained something, if you don’t understand, just ask. Your medical team are there to help you in any way they can.

You can read our Questions to ask about lymphoma booklet on our website at www.lymphomas.org.uk. You can also print this information at home or, if you prefer, our helpline can send you a copy – email information@lymphomas.org.uk or ring 0808 808 5555.

Sources used

The full list of sources used in the preparation of this information is available on request. Please contact us by email (publications@lymphomas.org.uk) or telephone (01296 619409) if you would like a copy.


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**Other useful organisations**

**Macmillan Cancer Support**

Macmillan produce a range of information, including a booklet called *Understanding radiotherapy* (This is relevant to a range of different cancer types, not specifically to lymphoma).

www.macmillan.org.uk

**Cancer Research UK**

Cancer Research UK’s website has information about the different types of radiotherapy. They also give information about research into radiotherapy for cancer.

www.cancerresearchuk.org

**NHS Choices**

The NHS Choices website gives information about radiotherapy.

www.nhs.uk/conditions/radiotherapy
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