

PET/CT scan

This information outlines PET (positron emission tomography) and computed tomography (CT). Using these techniques together as a PET/CT scan helps to give a clear picture of how lymphoma is affecting your body. Sometimes, PET/CT scans are called PET scans for short.

We have separate information about [ultrasound scans](#), [X-ray scans](#), [being referred for tests and scans](#) and [waiting for test results](#).

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We have separate information about the topics in **bold font**. Please get in touch if you'd like to request copies or if you would like further information about any aspect of lymphoma. Phone 0808 808 5555 or email information@lymphoma-action.org.uk.

CT scans

A computed tomography (CT or CAT) scan uses lots of **X-rays** to take pictures through your body. The X-ray images are shown on a computer screen – they can show 'slices' through your body in any direction.

When is a CT scan used for people who have lymphoma?

CT scans are better than X-rays at taking pictures of internal organs, including **lymph nodes**. They might be used to help:

- diagnose and **stage** lymphoma
- find the best place to take a **biopsy**
- **plan radiotherapy** treatment
- check response to treatment, by comparing scans taken before, during and at the end of a course of treatment
- to find out if your lymphoma has come back (**relapsed**) if you have symptoms that could suggest it has.

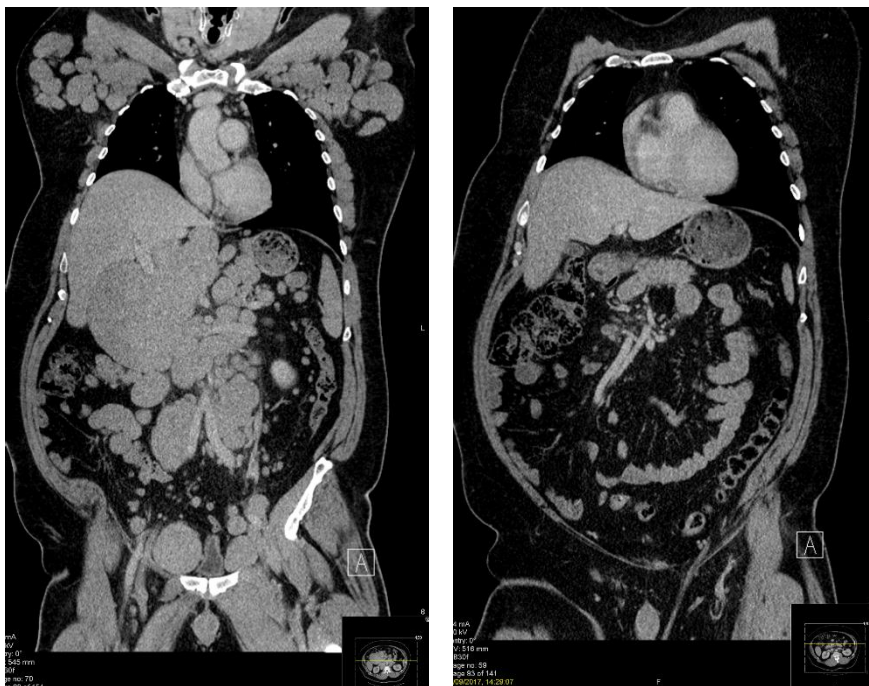


Figure Left: Swollen lymph glands (enlarged lymph nodes) in armpits and tummy (abdomen) on a CT scan at diagnosis. Figure Right: Good quality response to treatment. © The Royal Marsden NHS Foundation Trust

Positron-emission tomography (PET) scans

PET scans use a harmless radioactive form of sugar (a 'radiotracer') to look at how active the cells in your body are. Lymphoma cells are quite active, so take up quite a lot of sugar. A special camera recognises the radioactivity in the cells, which shows up as 'hot spots' on the scan image.

Fluoro-deoxy-glucose (FDG) is the radiotracer most often used in PET scans. This might be called an FDG-PET. You have FDG as an injection into a vein before your PET scan. Side effects from the injection are uncommon and generally very mild. Your hospital team should talk to you about these beforehand.

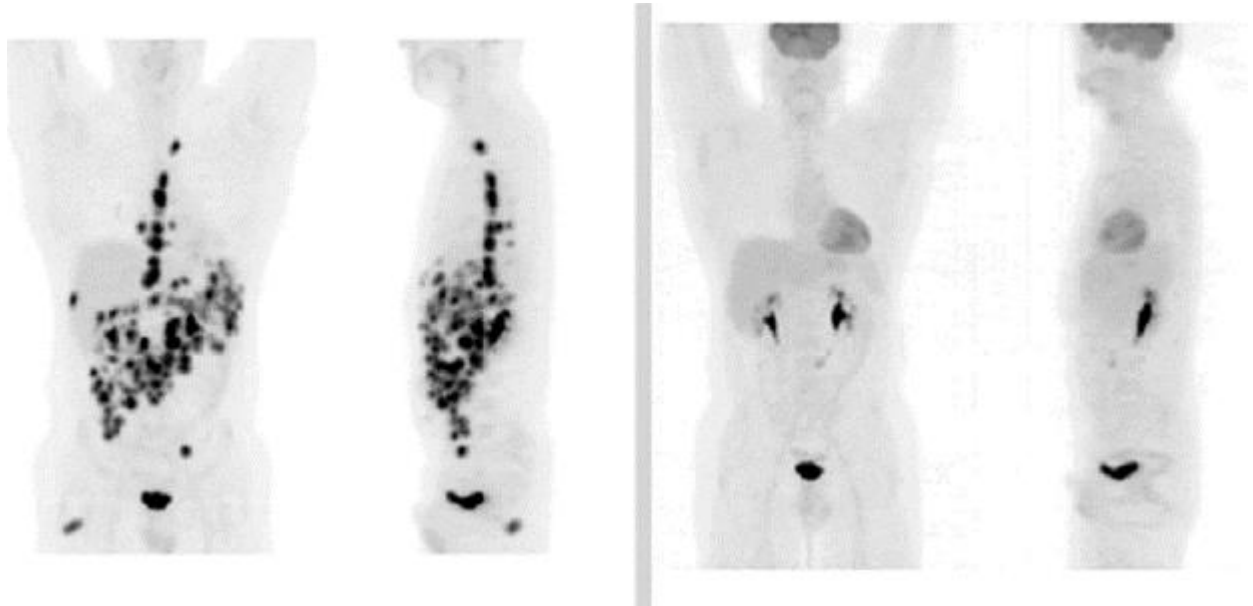


Figure Left: Non-Hodgkin lymphoma stage IV. Figure Right: Complete response to treatment (where all the remaining black areas are healthy) © The Royal Marsden NHS Foundation Trust

When is a PET scan used for people who have lymphoma?

PET scans might be used:

- before **treatment**, to help **stage** (work out which parts of your body are affected by) the lymphoma
- after a few cycles of treatment, to help plan the next part of treatment
- at the end of your treatment, to check your lymphoma response to it
- to find out if your lymphoma has come back (**relapsed**) if you have symptoms that could suggest it has.

If you need a PET scan after treatment, doctors usually recommend waiting:

- 3 to 4 weeks after finishing a course of **chemotherapy**
- around 3 months after finishing a course of **radiotherapy**.

This is because there might still be some activity where the lymphoma was, which could confuse the results.

PET/CT scans

A PET/CT scan is where you have both a **CT scan** and a **PET scan** in the same appointment. A PET/CT scan can help give a clearer picture of which areas of your body are affected by lymphoma.

Most people with lymphoma have several scans. CT and PET/CT scans can be helpful in diagnosing, planning treatment and checking your lymphoma response to treatment.

Professor George Mikhaeel, Consultant Clinical Oncologist

Preparing for a scan

You'll be given information in advance about how to prepare for your scan, including about:

- Medication – your medical team should tell you if it's safe to have any of your usual medication before your scan. If you are having a **PET scan** and you are taking medication for **diabetes**, check with your hospital team. They might advise you not to take tablets or insulin for a number of hours before the scan.
- Food and drink – your medical team should tell you if you can eat and drink normally before your scan, or whether you need to stop eating ('fast') for a while beforehand. Usually, you're asked not to eat or drink anything except for water for 6 hours before a PET/CT scan. If you have diabetes, you'll be given advice about eating.
- Physical activity – you might be asked not to do strenuous exercise in the 24 hours before a PET/CT scan.

You are usually asked to take off any metal you're wearing, for example jewellery, a belt, watch, or underwired bra. If you wear glasses, you might need to remove these too. The staff in the scanning department ask you whether you are, or could be pregnant.

If you will be having a **contrast agent**, the hospital might ask that you arrive at your appointment an hour early. This is to allow time for questions about your general health, in order to check that it's safe for you to have the contrast agent.

Having a scan

Usually, you have a scan in the radiology or nuclear medicine department of a hospital, as an outpatient. If your local hospital doesn't have a PET/CT scanning machine, you might need to travel to a hospital that's further away. Sometimes, however, it's possible to have one at a mobile unit.



Figure: CT scanner

A PET/CT scan usually takes 30 to 60 minutes. However, you're likely to be in the scanning department for 2 to 3 hours. You have your **radiotracer** injection and then wait for 60 to 90 minutes before having the scan. This allows time for your cells to take up the radiotracer.

To have your scan, you lie on a couch that moves slowly into the scanner. The scanning machine does not surround your whole body at any one time.

- Once you are in the scanner, the hospital staff leave the room, where they can see you from behind a glass screen and a video camera. You can speak to one another through a two-way speaker. If you feel unwell or distressed, you can ask for help or raise your hand.

- You need to **keep very still** during the scan. You might be asked to hold your breath for a few seconds at a time to help you stay still.

You can usually go straight home after the scan. However:

- You might be asked to stay in the hospital for a short time after a CT scan if you have had **contrast agent** through an injection. This allows time for hospital staff to check for any signs of an **allergic reaction**.
- You should avoid close contact with pregnant women, babies and young children for 6 hours after your PET/CT scan. This is because you still have some **radioactivity** in your body from the radiotracer. Most of it will leave your body after about 6 hours.

Airports and sea ports often have radiation alarms that could be set off by the radiotracer in your system. The level of radiation given off is considered to be low and safe after 6 hours. However, radiation detectors can be very sensitive and can detect very small levels. If you travel by air or sea within a few days, it could be helpful to take something with you to explain that you have recently had a medical scan. This could be your appointment letter or some other official confirmation from the department where you had your scan.

Contrast agents

A contrast agent is a type of dye. It helps to show internal structures (blood vessels, organs and tissues) clearly. You can have a contrast agent either as a drink or by injection into a vein in your arm – it depends which part of your body is being scanned.

Are there any side effects of having a contrast agent?

Side effects from contrast agents are uncommon. The contrast agent might make you feel hot all over, but this usually only lasts for a few minutes. Sometimes people feel sick for a few minutes after having the contrast agent.

If you have a contrast agent by injection, it can sometimes sting and you might feel warm or cold where the contrast is injected. Depending on the type of contrast agent, you might experience:

- warmth travelling down your arms
- a strange taste in your mouth
- feeling as though you need to wee

- feeling sick or dizzy.

All of these usually pass very quickly.

Allergic reactions

There is a small risk of having an allergic reaction to a contrast agent. If this happens, it could cause itchy skin, swollen lumps and, in severe cases, difficulty breathing. Staff monitor you carefully and are trained to treat any allergic reactions promptly. Before you have the contrast agent, they will check in your medical notes and by asking you whether you have:

- certain conditions
- particular allergies
- had an allergic reaction to a contrast agent in the past.

These factors could increase your risk of developing an allergic reaction to the contrast agent; you might be given a steroid medication before you have it, to lower this risk.

If you have a known allergy to the contrast material being used, then you might have your scan without a contrast injection. Your doctors will choose the most appropriate scan for you.

Frequently asked questions about PET/CT scans for lymphoma

In this section, we answer some of the questions people often have. Speak to your GP or a member of your medical team if you have questions or concerns about your specific situation.

Who carries out the scan?

A radiographer carries out the scan. This is a health professional who is trained in doing **X-ray**, **MRI**, **PET** and **CT** scans.

Do scans use radiation?

Some types of scan use a type of energy called radiation. This includes PET/CT scans.

High levels of radiation can cause cancer. However, the risk of developing cancer from the level of radiation used in medical scans is extremely low. Doctors weigh up the possible risks and benefits before they decide to do any type of scan.

Will I be radioactive (give off radiation) after a scan?

You will not be radioactive after a CT scan.

With a PET or a PET/CT scan, you will give off very low levels of radiation for around 6 hours afterwards. As a precaution, you should avoid being close to women who are pregnant during this time. It should also be safe to be around adult pets, as long as they are not pregnant.

Can I have a scan if I am pregnant or breastfeeding?

The advice on scans during pregnancy and while breastfeeding depends on the type of scan you have.

There is a small risk to the development of an unborn baby from a PET/CT scan, especially during the first trimester of pregnancy. If you are pregnant, you might have a different type of scan to investigate the lymphoma, for example an **ultrasound scan** or a **magnetic resonance imaging (MRI)** scan.

If you are breastfeeding, you might be advised to stop for a short while after having the radiotracer injection. Follow the advice of your doctors. You might consider expressing milk beforehand so that somebody else can feed your baby for a few hours after you have the scan.

If you have **only a CT scan**, in general, it's considered safe to breastfeed afterwards, including if you've had a **contrast agent**.

Are scans painful?

Scans aren't painful but they can be uncomfortable if you need to stay still for a long time. If you think you'll find it difficult to lie still for long enough, ask your medical team for advice. They might suggest using support pillows to help keep you as comfortable as possible during the scan, or taking pain relief medication beforehand.

What should I do if I feel anxious about having a scan?

Talk to a member of your medical team if you feel anxious about having a scan. They can answer any questions you have and might suggest ways of coping with your anxiety.

In some cases, the hospital might be able to arrange for you to visit the scanning department. This can be helpful to familiarise yourself with the room and equipment in advance of the day.

You could take some music with you to listen to through headphones during the scan. This can help to take your mind off the procedure.

Dr Bhupinder Sharma, Consultant Radiologist

If you feel very anxious, you might be able to have an anti-anxiety drug before your scan. However, this is more common with MRI than with other types of scan. If you think an anti-anxiety drug could help you, talk to the staff in the scanning department about the possibility of having one before the day of your appointment. If you have an anti-anxiety drug, you should not drive for the rest of the day after your scan.

Can I have a scan if I have diabetes?

For some types of scan, it is important for doctors to know you have diabetes. You might be given different advice about what to eat on the day of your scan, including about how to take your medication. In some cases, your scan might be arranged for a time of day that plans around your usual blood sugar levels.

Can I take someone with me to my scan?

For most scans, friends or family members can't stay in the room with you during the scan itself. However, they can still go with you to the hospital and wait in a different room.

When will I get the results of the scan?

Your medical team should be able to give you an idea of when to expect your test results. Staff in the scanning department won't be able to give you your scan results while you're at the hospital.

The person doing the scan isn't usually trained to understand what the images mean. Instead, this information needs to be sent to a specialist. The expert uses the scan and the results of all your other tests to help them work out what your scan pictures mean.

For some people, **waiting for test results** can be a particularly anxious time. Although the wait might feel long, it is important that doctors collect all of the information they need so that they can plan the best **treatment** for you. If you'd like to talk about how you're feeling, our **helpline team** is here to support you.

Will I have scans during my follow-up?

You might have a scan at the end of your treatment to check how well your lymphoma has responded. They are not routinely used as part of **follow-up** as there is no evidence to suggest that follow-up scans for lymphoma change lymphoma treatment or outcomes. If lymphoma comes back (**relapses**), it's usually noticed at routine follow-up appointments. Research has shown that if lymphoma comes back (**relapses**), it's usually first noticed by the person with lymphoma. Having scans only when they are considered to be helpful and safe helps to keep your exposure to radiation as low as possible.

References

The full list of references for this page is available on our website. Alternatively, email publications@lymphoma-action.org.uk or call 01296 619400 if you would like a copy.

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✓	Evidence-based
✓	Approved by experts
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