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Reduced fertility

Many people have children after treatment for lymphoma. However, your fertility (ability to have children) might be reduced. This information outlines ways of helping to preserve your fertility before lymphoma treatment. It also covers ways of helping you to start a pregnancy (conceive) should you have difficulties after treatment for lymphoma.

On this page

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**.

How might lymphoma treatment affect fertility?

Some **treatments for lymphoma** can affect your fertility. This is more likely with:

- certain **combinations of chemotherapy drugs (regimens)**
- high-dose chemotherapy used before a **stem cell transplant**
- **radiotherapy** to the area below your belly button (pelvic area).

Some **antibody therapies** might also affect your fertility. However, as these treatments are newer, scientists are still finding out about their effects on fertility.

> **It's important to remember that many people treated for lymphoma go on to have children afterwards. However, if this is a worry for you, do speak to your clinical team.**
> Professor Richard Anderson, University of Edinburgh

Your doctors should talk to you about whether your lymphoma treatment is likely to affect your fertility. It's a good idea to talk to them about your fertility **before** you begin treatment. If you are a **parent of a child with lymphoma**, speak to **your child's medical team** **before** his or her treatment begins.

Chemotherapy and fertility

Chemotherapy drugs damage lymphoma cells or stop them from making copies of themselves (multiplying), but they also affect some of your healthy cells. This can cause **side effects**, including reduced fertility. The likelihood of this happening depends on several factors, including:

- the **type of chemotherapy drugs** you have
- the **total dosage of chemotherapy**
- whether you are **male** or **female**.

Type of chemotherapy drugs

If there is a risk that your **chemotherapy drugs** could affect your fertility, your medical team should discuss this with you before you begin treatment. Different drugs can have different effects on your fertility, depending on how much damage is done to your ovaries or testes.

- There is a low risk with some regimens, such as ABVD – doxorubicin (Adriamycin®), bleomycin, vinblastine and dacarbazin.
- There is a high risk with some regimens, such as BEACOPP – bleomycin, etoposide, doxorubicin (Adriamycin®), cyclophosphamide, vincristine (Oncovin®), procarbazine and prednisolone.
- There is also high risk with the chemotherapy drugs carmustine, melphalan and busulfan.

Less is known about the effect of newer drugs, such as bendamustine, on fertility.

The total dosage of chemotherapy drugs

In general, the higher the total dosage of chemotherapy drugs you have, the more likely it is that your fertility will be affected.

Your total dosage depends on whether you have a drug on its own or as part of a combination of drugs (**chemotherapy regimen**). In general, the more cycles of treatment you have, the greater the dose of drug.

Having a **stem cell transplant** usually involves high doses of chemotherapy, which increases the risk of having fertility difficulties.

Effects of chemotherapy on male fertility

Chemotherapy often affects a man's fertility, at least temporarily. Cells that divide quickly (which includes those that make sperm) are sensitive to the effects of chemotherapy.

As a side effect of chemotherapy treatment, men might experience:

- **low sperm count** (oligospermia)
- no sperm (azoospermia).

Your general health also has an effect on the number and quality of your sperm. Even before you have treatment, lymphoma can lower your sperm count. In some cases, a man's sperm count might actually be higher **after** treatment than before it.

Boys who have not yet started puberty have germ cells in their testes (testicles), which later develop into sperm. Chemotherapy can damage germ cells, so having treatment before puberty can also affect a boy's fertility later on.

How soon after chemotherapy can I have a baby?

After a standard-dose chemotherapy regimen, your sperm count usually recovers and your fertility returns to its pre-treatment level. It can take a year or more after finishing treatment for this to happen.

Doctors usually recommend waiting a while after completing chemotherapy before conceiving a baby. This is because the drugs can pass onto your partner through your semen for around a week after treatment.

As a general guide, it is **not** recommended to conceive within 3 months of finishing chemotherapy. This is to help give your body time to recover from treatment. It also helps to avoid starting a pregnancy using sperm that were being made while you were having chemotherapy – it takes around 3 months to make sperm, so waiting at least that long (and ideally a few extra months) after finishing treatment is recommended.

Some people wait for around 2 years afterwards, when the risk of lymphoma coming back (**relapsing**) is usually lower. Seek advice from your doctor about your individual circumstances.

Should I use contraception during treatment?

Doctors usually recommend using a condom during treatment and for a while afterwards. This is because the chemotherapy drugs can pass onto your partner through your semen for around a week after treatment. It is advisable to take such precautions during vaginal, anal and oral sex.

What should I do if I'm worried that chemotherapy might affect my fertility?

Speak to your medical team if you're worried that chemotherapy might affect your fertility. There are techniques available to **freeze your sperm**, and to help preserve your future fertility options. There are also ways of helping you to conceive if you have difficulty doing so after treatment for lymphoma.

The National Institute of Health and Care Excellence website has a list of suggested **questions to ask about fertility problems: assessment and treatment**.

Effects of chemotherapy on female fertility

Most women treated for lymphoma are able to have children afterwards. However, chemotherapy can damage eggs and can leave you with fewer eggs in your ovaries than you would otherwise have had. This is because women are born with their eggs already made in their ovaries. The number of eggs gradually lowers over time, and the menopause (last menstrual period) happens when there are not enough eggs left to keep regular menstrual cycles going. The average age of menopause in the UK is 51 years old. If chemotherapy reduces the number of eggs in your ovaries to a very low number, you might have 'premature ovarian insufficiency' (POI), also called an **early menopause**.

You can read more about **how age affects fertility** and about **menopause** on the NHS website.

No one can tell for certain exactly if chemotherapy will affect your fertility. Some types of chemotherapy have a more of an impact than others, especially when given at a high dose and over a long time.

Chemotherapy can affect the ovaries of young girls as well as of adult women. However, it does not affect the ability of the uterus (womb) to carry a pregnancy.

It is very common for your periods to stop during chemotherapy. In younger women, they usually come back, although it may take many months for ovulation (the process of egg release) to begin after treatment.

How soon after chemotherapy can I have a baby?

Doctors advise against conceiving a baby too soon after completing chemotherapy.

As a general guide, to give your body time to recover, it is not recommended to conceive within 3 months of completing chemotherapy. Some people wait for around 2 years afterwards, when the risk of lymphoma coming back (**relapse**) is usually lower. Seek further advice from your doctor about your individual circumstances.

Should I use contraception during treatment?

Doctors usually recommend using a reliable method of contraception during treatment and for a while afterwards. This is because the chemotherapy drugs can pass onto your partner through your vaginal fluids for around a week after treatment. It is advisable to take such precautions during vaginal, anal and oral sex.

What should I do if I'm worried that chemotherapy might affect my fertility?

At the moment, there are no effective methods to prevent the damaging effects of chemotherapy on the ovaries. If you are of reproductive age (or younger), talk to your medical team about options for **preserving your fertility** before you begin treatment.

Radiotherapy and fertility

Radiotherapy uses radiation (high-energy X-rays) to destroy cancer cells. If it is given to the pelvic area (just below your belly button), there is a possibility of temporary or permanent infertility in **men** and **women**.

In women, radiotherapy can affect the uterus (womb) as well as the ovaries, which can affect the ability to carry a pregnancy.

Talk to your medical team about this **before** you begin treatment.

Effects of radiotherapy on men's fertility

Radiation received to the testes (testicles) or surrounding areas can cause temporary or permanent infertility. Reduced fertility can also be a **late effect** (a health problem that can happen months or years after treatment). This is because the testes make sperm and the hormone testosterone. Through its effects causing DNA damage, radiation can lower the number and quality of sperm. To minimise this risk, it is sometimes possible to shield this area during treatments.

In general, damage to the testes, and therefore the effects on fertility, depends on the **dose of the radiation** you have.

- Radiation received to or around the testes can cause temporary or permanent infertility. This might include radiation to the tummy (abdomen), pelvis and spine. It can also sometimes affect your ability to have an erection or to ejaculate.
- Radiotherapy given directly to your testes can make you permanently infertile.
- **Total body irradiation (TBI)**, which is sometimes used before a **stem cell transplant**, usually causes permanent infertility.

You should use a reliable method of contraception during, and for at least 3 months after, radiotherapy – your medical team can advise you further. Even if your fertility isn't affected in the long-term, your sperm might be damaged in the short-term after radiotherapy. If a child is conceived during, or soon after, radiation, it could cause abnormalities in the child. However, later on there is no known risk to children born from men who have received radiotherapy.

Talk to your medical team about ways to help **preserve your fertility options** **before** you begin treatment for lymphoma.

Effects of radiotherapy on women's fertility

Immature eggs (oocytes) develop into mature eggs, and these are released during menstruation. They are very sensitive to radiation. Women who have radiotherapy to the pelvic area are likely to have fewer eggs afterwards. If you do not have enough eggs to keep your menstrual cycle (periods) going, you will have 'premature ovarian insufficiency' (POI), also called an **early menopause**.

In many women who have had pelvic radiotherapy, the uterus (womb) is less able to carry a pregnancy. This is because pelvic radiotherapy affects the blood supply to the uterus and causes scar tissue to develop, which can lead to miscarriage or premature delivery, however there is no known increased risk of abnormalities in children born from women who have received radiotherapy.

Total body irradiation (TBI) also affects fertility because the pelvic area receives radiation during the process. This affects both the ovaries and the uterus. Women who have had TBI are often unable to carry a pregnancy.

If you are of reproductive age (or younger), talk to your medical team about **preserving your fertility** **before** you begin treatment for lymphoma.

Preserving fertility

In general, fertility preservation is more effective if measures are taken before you begin treatment for lymphoma. **If your child has lymphoma**, talk to your child's medical team before their treatment begins.

The National Institute of Health and Care Excellence (NICE) states that there should be no lower age limit set on who should be offered fertility preservation before their treatment.

> **At diagnosis, the impact of the cancer and its treatment on future fertility should be discussed between the person diagnosed with cancer and their cancer team.**
> The National Institute of Health and Care Excellence (NICE)

We outline some of ways of preserving fertility in **men** and in **women** below.

Some of the techniques for preserving fertility have been used for many years, while others are experimental. Fertility treatments are not always available on the NHS for people with cancer, and not all techniques are suitable for everyone.

Preserving fertility in men

The following section describes techniques used for preserving fertility in men: **sperm banking** and **testicular tissue freezing**.

The Human Fertilisation and Embryology Authority has **guidance on choosing a clinic**, as well as an **online database** to search for fertility treatments, both NHS and private, across the UK.

Sperm banking (sperm freezing)

Sperm banking is the main option for men who want to preserve their fertility. The **National Institute of Health and Care Excellence (NICE)** recommends that sperm banking is offered to all men whose treatment for cancer could affect their fertility.

Sperm banking involves collecting and storing semen (the fluid that contains sperm). Your semen is preserved by freezing it at around minus 170°C and stored for you to use when you would like to have a baby.

There are no known risks to using frozen sperm. However, as cancer treatment can affect the number and quality of your sperm, you must bank your sperm **before** you start your treatment for lymphoma.

A member of your medical team should explain the process of sperm banking to you. You should also be offered the opportunity to discuss sperm banking with a specialist fertility counsellor.

Sperm banking is also an option for teenage boys who have gone through puberty.

The Human Fertilisation and Embryology Authority website has more information about **sperm banking (freezing)**.

Testicular tissue freezing (testicular cryopreservation)

Sperm aren't made before puberty, but the germ cells that later produce sperm are present within the testicles.

Testicular tissue freezing (testicular tissue cryopreservation) involves taking some of the tissue from your testicles (organs that produce sperm) and freezing it to use at a later date. Any tissue is checked to see that it is free from cancer cells before it is used.

Researchers are studying the effectiveness of this technique. As is it quite new, no babies have been born through this procedure and it is still considered experimental. As more boys who have frozen testicular tissue become old enough to use it, scientists will learn more.

At the moment, testicular tissue freezing might be an option for:

- men who don't produce any living (viable) sperm
- boys who have not yet reached puberty.

Testicular freezing is offered only for research purposes in a very small number of centres. Your medical team can advise you on facilities available in your area.

After lymphoma treatment, cells from the testicular tissue can be put (transplanted) back to the donor. This might restore fertility by starting up sperm production again. Researchers are also investigating the possibility of developing sperm from germ cells in the laboratory.

Preserving fertility for women

The following section describes techniques used for preserving fertility in women. The most common techniques are **egg freezing** and **embryo storage**. **Ovarian tissue freezing** and **ovarian transposition** are more experimental techniques.

Not all techniques are suitable in all cases, and some are not available on the NHS. The Human Fertilisation and Embryology Authority has **guidance on choosing a clinic**, as well as an **online database** to search for fertility treatments, both NHS and private, across the UK.

You might also be interested in the **Cancer, fertility and me** website, which aims to help women affected by cancer make decisions about preserving their fertility.

Egg freezing

The most common option for women is to freeze eggs. As lymphoma treatment can affect eggs, this must be done **before** treatment starts. It involves injections to stimulate the ovaries, which takes about 2 weeks. The eggs are then removed – this is done using an internal ultrasound scan and needle that passes through the top of the vagina into the ovaries, and the eggs can then be frozen.

The Human Fertilisation and Embryo Authority has information about **egg freezing**, including about how the process works, its success rates and risks.

Embryo storage

An embryo develops from a fertilised egg. The first part of the process of embryo storing is the same as for egg freezing, but the eggs are mixed with sperm from your partner (or occasionally a donor). The eggs then develop into embryos, and can then be frozen (cryopreservation). These embryos are stored in liquid nitrogen until you would like to use them to start a pregnancy.

Embryo storage might be an option if you have a long-term partner. Be aware that if your partner later withdraws his consent to use the embryos, they must be destroyed.

Ovarian tissue freezing

Ovarian tissue contains eggs, so freezing ovarian tissue (ovarian cryopreservation) stores immature eggs. The tissue is later thawed and transferred back into your body. If the tissue starts to produce eggs again, it might be possible to conceive naturally or by **in-vitro fertilisation (IVF)**.

You need to have keyhole surgery (laparoscopy) to remove ovarian tissue. Replacing it later will also require an operation.

Ovarian tissue freezing is possible for women. It's also possible for girls who have not yet reached puberty so do not have mature eggs to collect for freezing. The frozen tissue can be replaced in her later, when she wants to conceive.

As it is quite a new technique, only a small number of babies have been born using ovarian tissue freezing. However, it is becoming accepted as an effective way of preserving women's fertility.

Ovarian transposition

Ovarian transposition means temporarily moving the ovaries higher up into the tummy (abdominal) area, out of the way of radiation if you are having pelvic radiotherapy.

The evidence to show how effective this technique is isn't very clear and it might not work. This could mean either a further procedure later to move your ovaries back to help you get pregnant naturally, or using IVF. Talk to your medical team if you would like to find out more about this technique.

If you have difficulties conceiving

If you have difficulties conceiving after treatment for lymphoma, there are techniques that can help both **men** and **women**. These are known as assistive reproductive techniques (ARTs).

Assisted reproductive techniques (ARTs)

Assisted reproductive techniques (ARTs) are technologies that use both eggs and sperm. They are considered to be safe and not to carry high risks of any long-term negative impacts, for either the parent or the child.

There are different options of ARTs available for **men** and **women**; however, the general recommendation is to try to conceive a child naturally at first. You'll give yourself the best chance of pregnancy if you have sex every 2 or 3 days. If you or your partner does not get pregnant within a year of trying naturally, you might like to seek advice. Sometimes, the difficulty is nothing to do with your lymphoma treatment, so it's important to get it looked into properly with tests for both you and your partner.

Success rates for these techniques vary significantly depending on the age of the woman. However, the general trend is that success rates have improved considerably over the years, and there has been a significant reduction in multiple births that can happen with such technologies.

The Human Fertilisation and Embryology Authority has **research and data** information on their website. Some general points from their 2019 data are:

- Most IVF treatments use the eggs of a woman experiencing fertility difficulties and the sperm of her partner. However, the use of donor eggs and sperm has increased over time.
- Female age is very important in success rates, which is about 1 in 3 in women aged under 35 and falls to 1 in 5 or less by age 40.

Techniques to help men father a child

After treatment for lymphoma, some men choose to have tests to check whether they are producing sperm. Your medical team can offer advice if you would like to do this.

If you are, fertility treatments using your sperm might be a suitable option for you. If tests show that there is a problem with your sperm production, you might be advised to use sperm that you stored before you had treatment for lymphoma. If you didn't store any, you might consider **artificial insemination by donor (AID)**.

After treatment for lymphoma, some men choose to have their semen quality checked. Your medical team can offer advice if you would like to do this.

You might also have tests to check whether you are producing sperm. If you are, fertility treatments using your sperm might be a suitable option for you. If tests show that there is a problem with your sperm, you might be advised to use sperm that you stored before you had treatment for lymphoma. If you didn't store any, you might consider **artificial insemination by donor (AID)**.

After I finished my lymphoma treatment, it was confirmed that I was infertile. My wife and I went on to have our first child nine years after my sperm was stored. We had twins a couple of years later, and after that, our youngest was born. My youngest son was born 16 years after my sperm was first stored!
Giles, whose lymphoma treatment affected his fertility

The following techniques might be available to you if you have difficulties conceiving naturally:

- **In-vitro fertilisation (IVF)**: your thawed sperm is combined with your partner's eggs in a laboratory. If the eggs are successfully fertilised by the sperm, one of the embryos that develop from them are put into your partner's uterus to begin a pregnancy.
- **Intracytoplasmic sperm injection (ICSI)**: a single thawed sperm is injected into a single mature egg in the laboratory. Around 6 out of 10 of these eggs form an embryo. An embryo is inserted into the uterus as in IVF (so you may hear this called ICSI-IVF). This technique can be useful when there are very few sperm available.
- **Intrauterine insemination (IUI)**: your thawed sperm are directly inserted into your partner's uterus. The chance of pregnancy using sperm within IUI treatment varies significantly between couples. You can discuss this with a fertility specialist.
- **Artificial insemination by donor (AID)**: a donor's sperm is directly inserted into your partner's uterus. If you do not have any sperm after your lymphoma treatment and you did not bank sperm, AID could be an option for you. Donor sperm can also be used in IVF, which might be the treatment needed if artificial insemination does not work.

The NHS has more information about **IVF** and **NHS-funded availability**.

Techniques to help women have a baby

After treatment for lymphoma, some women have tests to look at their ovaries, to check whether eggs are being released regularly.

You might also have tests to look at the number of eggs in your ovaries after your lymphoma treatment.

- If you have enough eggs, it might be possible to have fertility treatment using the eggs remaining in your ovaries.
- If you have a low number of eggs, you can use eggs or embryos that you stored before you had treatment for lymphoma.
- If your egg number is very low and you did not store any eggs or embryos before your lymphoma treatment, you might consider **fertility treatment using donated eggs**. These eggs can be fertilised with your partner's sperm or sperm from a donor.

If your uterus is damaged after pelvic radiotherapy, you can discuss your options with a fertility specialist. You might consider **surrogacy** (where another woman carries and gives birth to a baby). Surrogacy might not be funded by the NHS and comes with emotional and legal considerations, so you will need to take specialist legal advice.

If you **stored ovarian tissue** before treatment, using this might be an option.

Other options for men and women

Fertility preservation techniques and assisted reproductive techniques can be very effective in helping both men and women to conceive a baby. However, there are other options you might consider, such as **adoption**. You could also speak to your local council about **becoming a foster parent**.

Emotional wellbeing and resources

Difficulty conceiving, undergoing tests and having fertility treatment can have a significant impact on your emotional wellbeing.

There is support available. Speak to your medical team for advice – your clinical nurse specialist (CNS) is likely to be a good person to speak to. You can also **contact us for support**.

> **People who are having problems conceiving are offered counselling before, during and after investigation and treatment for their fertility problems.**
> National Institute of Health and Care Excellence (NICE)

- If you are interested in a talking therapy, such as **counselling**, speak to a member of your medical team or your GP. You can also **search for a private therapist** on the British Association of Counselling and Psychotherapy website.
- Find relationship support – for example, through **Relate**, an organisation whose services include counselling, online information and workshops.
- Find out about **getting emotional support** and how to access it on the Human Fertilisation and Embryology Authority's website.
- **Fertility Network UK** offer a range of resources and support to people affected by fertility difficulties.

You can also find more organisations in the **fertility and pregnancy section of our useful organisations listing**.

Many people find that meeting others who can identify with their experience is a helpful source of emotional support. Through our **Buddy Service**, we might be able to put you in contact with someone who can relate to your experience.

> **My medical team discussed fertility with me, and I was told that the high-dose chemotherapy and total body irradiation would make me infertile. I was offered support at the hospital, but found the greatest support in talking to other people who have been through this themselves.**
> Kat, whose lymphoma treatment affected her fertility

You might also be interested in **Juliet's experience of lymphoma treatment and early menopause**.

References

The full list of references for this page is available on our website. Alternatively, email **publications@lymphoma-action.org.uk** or call 01296 619409 if you would like a copy.

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✓	Evidence-based
✓	Approved by experts
✓	Reviewed by users

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