



Fertility and Cancer

A guide for people with cancer,
their families and friends

Practical
and support
information

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13 11 20



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Fertility and Cancer is reviewed approximately every two years.

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Note to reader

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

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

Cancer Council

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



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About this booklet

Cancer and its treatment may affect a person's ability to conceive a child or maintain a pregnancy (fertility). This booklet has been prepared to help you understand more about the impact of cancer treatment on fertility.

If you want to become a parent, add to your family or even if you've not yet thought about having children, we hope this information will help you understand how you may be able to preserve your fertility before and during treatment. We also explain some options that may be available after cancer treatment. We cannot give advice about the best ways to preserve fertility. You need to discuss this with your doctors.

This booklet does not need to be read from cover to cover – just read the parts that are useful to you. Some medical terms that may be unfamiliar are explained in the glossary (see page 75). You may also like to pass this booklet to family and friends for their information.

How this booklet was developed

This information was developed with help from a range of health professionals and people affected by cancer. It is based on clinical practice guidelines for fertility and cancer treatment.¹⁻²

If you or your family have any questions, call Cancer Council **13 11 20**. We can send you more information and connect you with support services in your area. You can also visit your local Cancer Council website (see back cover).



**Cancer
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13 11 20

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Reproduction and fertility

Reproduction is the way we produce babies. Knowing how your body works may help you understand how fertility problems happen and why some people are unable to conceive.

How reproduction works

The female and male reproductive systems work together to make a baby. The process involves combining an egg (ovum) from a female and a sperm from a male. This is called fertilisation.

Role of hormones – These substances are produced naturally in the body. Hormones control many of the body's functions, including how you grow, develop and reproduce. The pituitary gland in the brain releases hormones that tell the body to make sex hormones.

- In females, the major sex hormones are oestrogen and progesterone, which are produced in the ovaries. These hormones control the growth and release of eggs, and the timing of periods (menstruation).
- In males, the major sex hormone is testosterone, which is produced mainly in the testicles. Testosterone helps the body make sperm.

Ovulation – Each month, from puberty (sexual maturation) to menopause (when periods stop), one of the ovaries releases an egg. This is called ovulation.

Pregnancy – The egg travels from the ovary into the fallopian tube. Here it can be fertilised by a sperm, which is ejaculated from the penis into the vagina during sexual intercourse. If the egg is fertilised, it will implant itself into the lining of the uterus and grow into a baby. After the egg is fertilised by the sperm, it's called an embryo.

Menopause – As females get older, the number of eggs in the ovaries drop and the ovaries produce less oestrogen and progesterone. When the egg numbers and the levels of these hormones fall low enough, periods will stop. This is known as menopause. This is the natural end of the female reproductive years and it usually happens around the age of 45–55.

Factors that affect fertility

Some of the common factors that affect fertility include:

- **age** – fertility naturally declines with age (see pages 11–12)
- **weight** – being significantly underweight or overweight
- **smoking** – active and passive smoking can harm reproductive health
- **alcohol** – drinking alcohol may affect fertility and make it harder to conceive
- **other health issues** – endometriosis, fibroids, pelvic disease, certain hormone conditions or cancer.

For more information about how cancer affects fertility, see *Key questions* on pages 10–16.

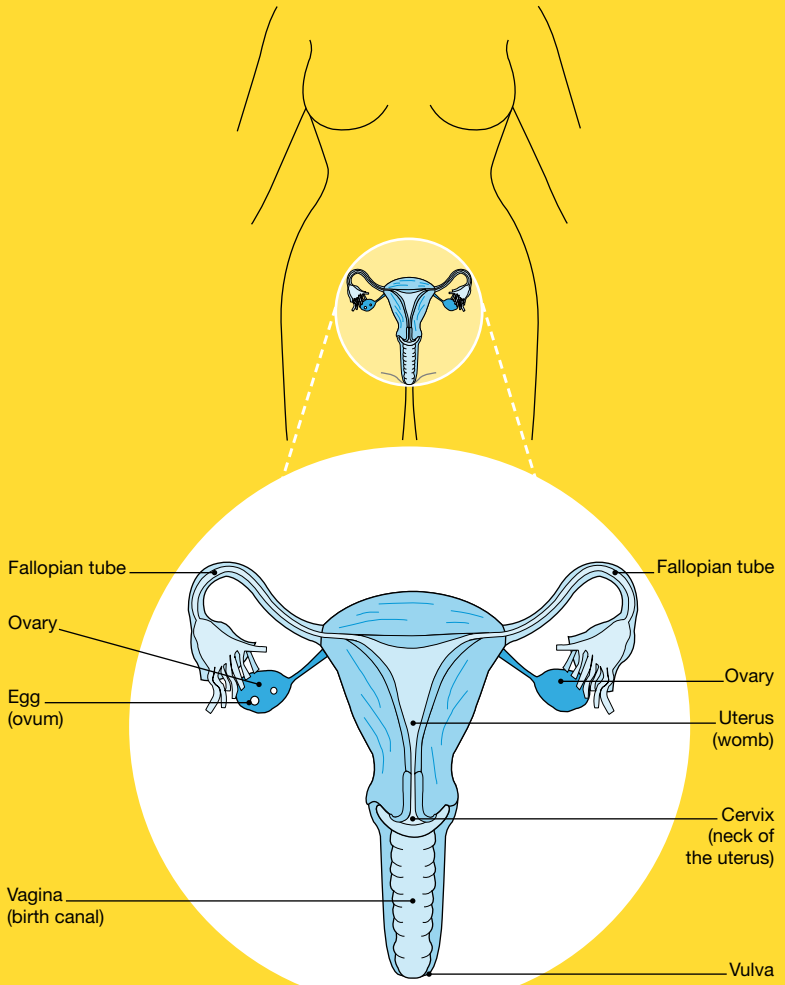
Transgender, non-binary or intersex?

The information in this booklet has been developed based on guidance and evidence in male and female bodies. If you are a non-binary or transgender woman, transgender man or person with an intersex variation, this information is still relevant to you if you have a cervix and a uterus or testicles and a penis – but your experience may be slightly different. For information specific to your situation, speak to your doctor.

The female reproductive system

The female reproductive system allows a woman to conceive a baby and become pregnant. It includes the following organs:

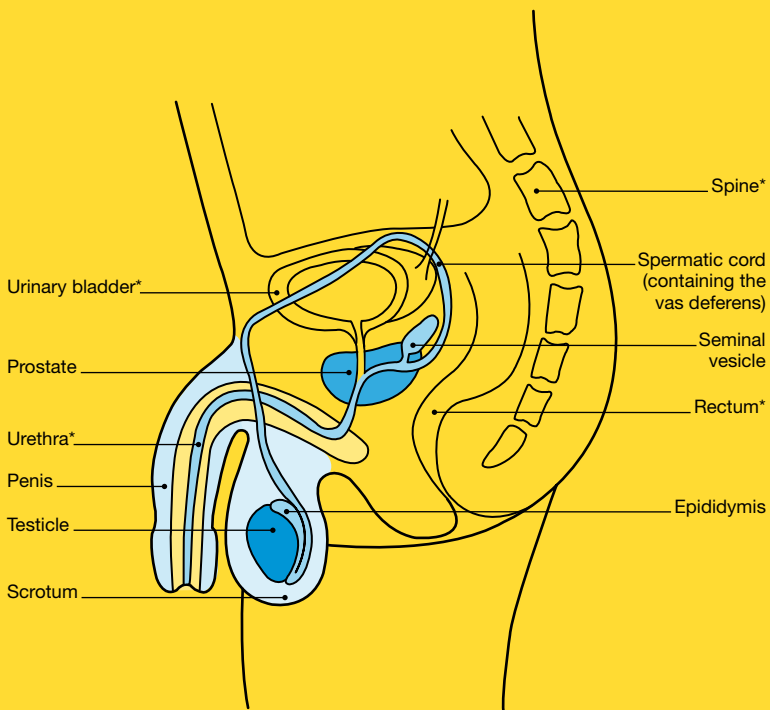
ovaries	<ul style="list-style-type: none">• two small, walnut-shaped organs in the lower part of the abdomen• contain follicles that hold immature eggs, which eventually become mature eggs• make the hormones oestrogen and progesterone
fallopian tubes	<ul style="list-style-type: none">• two long, thin tubes that extend from the uterus and open near the ovaries• carry sperm to the eggs and eggs from the ovaries to the uterus
uterus (womb)	<ul style="list-style-type: none">• a hollow muscular organ where a fertilised egg is nourished to form a baby• the inner lining is known as the endometrium; each month if an egg is not fertilised some of the lining is shed and flows out of the body (menstruation or monthly period)• joined to the vagina by the cervix
cervix (neck of the uterus)	<ul style="list-style-type: none">• the lower, cylinder-shaped entrance to the uterus• produces moisture to lubricate the vagina• holds a developing baby in the uterus during pregnancy and widens during childbirth
vagina (birth canal)	<ul style="list-style-type: none">• a muscular channel that extends from the opening of the uterus (the cervix) to the vulva• the passageway through which menstrual blood flows out of the body, sexual intercourse occurs and a baby is born
vulva	<ul style="list-style-type: none">• the external part of the female sex organs



The male reproductive system

The male reproductive system allows a man to fertilise an egg. It includes the following organs:

testicles (testes)	<ul style="list-style-type: none">• two small, egg-shaped glands• make and store sperm• also make the hormone testosterone, which is responsible for the development of male characteristics, sexual drive (libido) and the ability to have an erection
scrotum	<ul style="list-style-type: none">• the loose pouch of skin at the base of the penis that holds the testicles
epididymis	<ul style="list-style-type: none">• a tightly coiled tube attached to the outer surface of each testicle• sperm travel from the testicles through the epididymis to the spermatic cord
spermatic cord and vas deferens	<ul style="list-style-type: none">• tubes running from each testicle to the penis• contain blood vessels, nerves and lymph vessels• carry sperm towards the penis
seminal vesicles	<ul style="list-style-type: none">• glands that lie close to the prostate• produce fluids that make up part of semen
prostate	<ul style="list-style-type: none">• a small gland about the size of a walnut• produces fluids that form part of semen• located near the nerves, blood vessels and muscles that control bladder function and erections
penis	<ul style="list-style-type: none">• the main external sex organ• urine and semen pass out of the body through the penis• semen is made up of sperm and other fluids, and is ejaculated from the penis



* Not part of the male reproductive system



Key questions

Q: What is infertility?

A: Infertility is defined as difficulty getting pregnant (conceiving). This may result from female or male factors, or a combination of both. For females under 35, the term usually refers to trying unsuccessfully to conceive for 12 months; if a female is 35 or over, the term is used after six months of trying. Infertility is more common than many people realise – it affects one in six Australian couples.³ For information about how infertility can affect how you feel and your relationships, see pages 65–71.

Q: How does cancer affect fertility?

A: Cancer and its treatment may cause fertility problems. This will depend on the type of cancer and treatment you have. Infertility after treatment may be temporary, lasting months to years, or permanent.

Female reproductive organs – Some cancer treatments, especially chemotherapy and radiation therapy, may damage the ovaries and decrease the number of available healthy eggs. Radiation therapy may also damage other reproductive organs. Cancer treatments can reduce the level of hormones produced in the brain and the ovaries. Sometimes the reproductive organs are removed during surgery. All of these treatments can lead to early menopause. For further details, see *Female fertility and cancer treatments* on pages 20–27.

Male reproductive organs – Some cancer treatments, especially chemotherapy and radiation therapy, may affect sperm quantity

(low numbers of sperm are made), quality (the sperm do not work properly) or motility (the sperm move poorly). Sometimes, the reproductive organs are damaged or removed during surgery. For further details, see *Male fertility and cancer treatments* on pages 38–42.



Call Cancer Council **13 11 20** for free booklets and information about different cancer types and their treatments.

Q: What is fertility preservation?

A: This describes the procedures that someone can use to help maintain their ability to have children, for example, freezing eggs, embryos or sperm. These procedures are usually done before you have cancer treatment that may affect your fertility, but some are also used after treatment.

Q: How does age affect fertility after cancer?

A: Age is one of the most important factors that influences the impact of cancer treatment on fertility.

Female age and fertility – Females are born with all the eggs they will have in their lifetime. As they age, the number of eggs reduces. Fertility starts to decline after 30 and the decline speeds up after 35. It then becomes harder to conceive and the risk of genetic problems in the eggs increases. From the early 40s,

although a woman still has regular periods, it is difficult to conceive a child because of poor egg quality. After menopause, it is no longer possible to conceive a child naturally.

The impact of cancer treatments can vary with age. Before and after puberty, the effect of chemotherapy and radiation therapy on fertility can range from mild to severe, depending on the drugs used and the dose.

Before puberty, high doses of drugs or radiation may sometimes cause enough damage to the ovaries that both the start of puberty and future fertility are affected. After puberty, treatment to the ovaries can cause periods to stop. Even if periods return after treatment, some women may experience early menopause (see pages 25–27).

Male age and fertility – The quality and quantity of sperm decreases with age. This means it will take longer for an older man's partner to get pregnant. Before and after puberty, chemotherapy and radiation therapy may affect sperm production and may cause infertility. The effect of radiation will depend on where in the body the radiation is given and the dose.

“ The first time I met my surgeon she said, ‘You should go and see a fertility specialist’. It all happened very quickly. The only way to describe the process is that it was overwhelming. However, it's better not to delay it. ” *Mackenzie*

“ I was given a good prognosis, but we’re still nervous about what happens if it comes back and we leave a child without a parent. ” *Liam*

Q: Should I have a child after I’ve had cancer?

A: This is a very personal decision. A cancer diagnosis may affect the way you think and feel about having a child. If you have a partner, you may want to discuss your family plans together. Fertility clinics often have counsellors who can talk through the pros and cons of your situation.

Q: How long should I wait to conceive after treatment?

A: This depends on many factors, including the type of cancer and type of treatment. Some cancer specialists advise waiting between six months and two years after treatment ends. This may be to allow your sperm or eggs to recover, and to ensure you remain in good health during this time. It’s best to discuss the timing and suitable contraception with your doctor.

For some fertility treatments, you will need to take extra hormones or stimulate your hormones. If you have a hormone-sensitive cancer, you may be given hormone receptor blockers to reduce the risk of the cancer coming back. Discuss the potential risks of particular fertility treatments with your cancer or fertility specialist. Taking hormone receptor blockers during egg collection can help reduce the risks.

Q: Will getting pregnant cause the cancer to come back?

A: Research shows that for most cancers pregnancy does not increase the chances of cancer coming back (recurring). However, sometimes it is hard to do any follow-up tests for cancer when a woman is trying to conceive or is pregnant. Research is continuing, so it's best to discuss this issue with your specialist. To find out more about pregnancy and cancer, see pages 24 and 39.

Studies to date suggest that survival rates for people who have children after cancer treatment are no different from people who don't have children after treatment.

Q: If I've had cancer, will my children get cancer?

A: Studies show that if one or both parents have a history of cancer, their child is at no greater risk of getting cancer than anyone else. A small percentage of some cancers (up to 5%) are caused by an inherited faulty gene from either the mother or father. This is known as familial cancer. The faulty gene increases the risk of cancer, but even then it does not mean that a child will inherit the gene and develop cancer. For more information, see *If cancer genes are present* on page 60.

A genetic counsellor is the most qualified person to give you up-to-date information about the genetic risks of cancers for family members. For more information call Cancer Council 13 11 20.

Q: What if I'm already pregnant?

A: Being diagnosed with cancer during pregnancy is uncommon – it is estimated that one in every 1000 pregnant women is diagnosed with cancer.

It may still be possible to have cancer treatment during pregnancy. It's best to discuss the potential risks and benefits with your oncologist before treatment begins. In some cases, treatment can be delayed until after the baby's birth. For some cancers, chemotherapy may be safely used after the first trimester (12 weeks), usually with a break of a few weeks before the birth.

Some people diagnosed with cancer in the early weeks of pregnancy decide to terminate the pregnancy so they can start treatment immediately, while others who are diagnosed later in the pregnancy choose to have their baby before the due date.

You will be advised not to breastfeed during chemotherapy, targeted therapy or immunotherapy as drugs can be passed to the baby through the breastmilk. If you are having radiation therapy, talk with your doctor about whether it is safe to continue breastfeeding during your treatment course.

“ My oncologist wanted to start treatment as soon as possible, so it was a case of my obstetrician and oncologist deciding on a day to deliver my son, then starting my cancer treatment. He was delivered safely at 32 weeks. ” *Lily*

Q: Which health professionals will I see?

- A:** There are several people you may see to discuss fertility, including:
- **cancer specialist** – may be a medical oncologist, radiation oncologist, gynaecological oncologist, surgeon or haematologist; will discuss possible impacts on fertility before treatment begins and refer you to fertility specialists if necessary
 - **fertility specialist** – diagnoses, treats and manages infertility and reproductive hormonal disorders; may be an obstetrician, gynaecologist, reproductive endocrinologist or urologist
 - **paediatric gynaecologist, endocrinologist, surgeon** – doctors who specialise in fertility care of children with cancer
 - **fertility counsellor** – provides support and advice for people who are experiencing fertility issues
 - **genetic counsellor** – provides advice for people with a strong family history of cancer or a genetic condition linked to cancer
 - **urologist/andrologist** – diagnoses and treats diseases of the urinary system and the male reproductive system.

Let the fertility clinic or specialist know that you are having treatment for cancer so that they give you an appointment as soon as possible. Your cancer care team may also be able to help you get an appointment quickly. During the appointment, the fertility specialist will go through the options available to you. Your cancer specialist will make suggestions and together you can decide what works with your cancer treatment plan.

If you have a partner, try to attend appointments together and include them in the decision-making process. You may also wish to bring a family member or friend for support.



Making decisions

It's best to talk about ways to preserve or protect your fertility before cancer treatment begins. Fertility is something your treatment team should raise, but you can also bring up the topic yourself.

Seeing a fertility specialist – Most people find it helpful to receive information and advice about their fertility options. Ask your cancer specialist whether you should see a fertility specialist. You can also get a referral from your general practitioner (GP). As well as explaining your fertility options, a fertility specialist can help with contraception and hormone management during cancer treatment.

Ask questions – It's important that you feel comfortable to ask questions about the possible impact of different cancer treatments on your fertility as well as the possible risks of having treatment to preserve your fertility. You may find it helpful to plan some questions in advance (see page 74 for some suggestions) and to take notes during the discussion.

It's your decision – You may feel too overwhelmed by the amount of cancer information you are given at diagnosis to think about fertility. Or you may be asked to make fertility decisions before you've given much thought to whether you want to have a child in the future. Even if you think, "But I don't want kids anyway" or "My family is complete", a fertility specialist or counsellor will probably encourage you to consider as many fertility options as possible to keep your choices open for the future. These decisions are personal, and no decision is right or wrong. See the next page for some things you may want to consider.

➤ See our *Cancer Care and Your Rights* booklet.

What to consider when making decisions

After a cancer diagnosis, you may need to make several decisions about your fertility. It can be difficult to decide what to do, particularly if you have several options to consider. You may feel that everything is happening too fast.



Understand the available options

Generally, people make decisions they are comfortable with – and have fewer regrets later – if they gather information and think about the possible outcomes. Ask your health professionals to explain each fertility option, including risks, benefits, side effects, costs and success rates.

Expect to experience doubts

It's common to feel unsure when making tough decisions. Keeping a journal or blog about your experience may help you come to a decision and reflect on your feelings.



Talk it over

Discuss the options with people close to you (such as your partner, a friend or family member) or with an infertility counsellor or psychologist. Research shows that couples who make fertility decisions together are happier with the outcome, whatever it is.

Use a decision aid

A decision aid can help you focus on what matters most to you. Your health professional may be able to recommend a decision aid or give you a booklet setting out the options. Breast Cancer Network Australia has developed a resource called *Fertility-related choices* to help younger women with breast cancer make fertility-related decisions. Visit bcna.org.au/resources/booklets-and-fact-sheets.

The main costs of fertility treatment

Fertility treatments can be expensive and this may be a factor in your decision-making. Costs of specialists and private clinics vary across Australia. You may also be able to have treatment at a fertility unit in a public hospital or a clinic that provides discounted fertility treatment for cancer patients. Ask your fertility clinic about costs.

Depending on the treatment you have, costs may include:

- fertility specialist consultations – ask if they have special fees for people diagnosed with cancer, as sometimes this is the case
- medicines and blood tests
- fees for procedures (e.g. the different steps in the IVF cycle from egg or sperm collection to implantation of embryos after treatment)
- day surgery, operating theatre and anaesthetist fees
- egg, sperm and embryo storage (cryopreservation) – ask your clinic about up-front payments, instalment payments and annual fees.

Costs will depend on whether you are a public or private patient.

If you are a private patient, there may be Medicare rebates for some of these costs. Ask your fertility specialist for a written estimate of their fees and any Medicare rebates. Ask your private health fund (if you belong to one) what costs they will cover and what you'll have to pay – some funds only pay benefits for services at certain hospitals.

➤ See our *Cancer Care and Your Rights* and *Cancer and Your Finances* booklets.

Under Medicare you need a referral to see a specialist. It should list both you and your partner so you can claim the maximum benefit.





Female fertility and cancer treatments

This chapter provides an overview of how cancer treatments may affect female fertility. The most common treatments for cancer are chemotherapy, radiation therapy, surgery and hormone therapy. Other treatments include immunotherapy and targeted therapy.

Chemotherapy

Chemotherapy uses drugs to kill or slow the growth of cancer cells. These drugs travel throughout the body and are designed to affect fast-growing cells such as cancer cells. This means they can also damage other cells that grow quickly, including in the ovaries. If treatment reduces the total number of eggs, there is a high risk of infertility. The risk depends on:

- **the drugs used** – some types of chemotherapy drugs are more likely to damage eggs than others
- **the dose you are given** – the risk of damage to eggs increases with higher doses and longer treatment times
- **your age** – the number and quality of eggs decrease with age.

Having chemotherapy can cause your periods to become irregular or even stop for a while, but they often return to normal within a year of finishing treatment. If your periods do not return, the ovaries may have stopped functioning permanently, causing early menopause. For more information, see *Fertility outcomes after treatment* on pages 25–27.

Some chemotherapy drugs can affect your heart and lungs. If this causes long-term damage, it may make a future pregnancy and delivery more difficult. Your specialist will talk to you about what precautions to take during pregnancy.

Radiation therapy

Radiation therapy (also called radiotherapy) uses a controlled dose of radiation to kill cancer cells or damage them so they cannot grow and multiply. It can be delivered from outside the body (external beam radiation therapy) or inside the body (usually brachytherapy).

The risk of infertility will vary depending on the area treated, the dose of radiation and the number of treatments.

- Radiation therapy to the pelvic area (for cancer of the rectum, bladder, cervix, uterus or vagina) can stop the ovaries producing hormones. This results in temporary or permanent menopause. If your ovaries don't need treatment, one or both may be surgically moved higher in the abdomen and out of the field of radiation. This is called ovarian transposition or relocation (oophoropexy), and it may help the ovaries keep working properly (see pages 30–31).
- Radiation therapy to the pelvic area can also affect the uterus, make sexual intercourse uncomfortable, and increase the risk of miscarriage, premature birth and low birth weight.
- Radiation therapy to the brain may damage the pituitary gland, which releases hormones that tell the ovaries to release an egg each month. This may affect ovulation.

If you are treated with both chemotherapy and radiation therapy (chemoradiation), the risk of infertility is higher.





Some early-stage gynaecological cancers can be treated with fertility-sparing surgery (trachelectomy, see pages 30–31).

Surgery

Surgery that removes part or all of the reproductive organs, such as the ovaries, fallopian tubes, uterus and cervix, can cause infertility.

Removal of the ovaries (oophorectomy) – If both ovaries are removed (bilateral oophorectomy), you will experience early menopause. You will no longer have periods or be able to become pregnant naturally. If only one ovary is removed, the other should continue to release eggs and produce hormones. You will still have periods and may be able to become pregnant if you still have a uterus.

Removal of the uterus and cervix (hysterectomy) – This may be used to treat gynaecological cancers, such as cancer of the cervix, ovary, uterus and endometrium (lining of the uterus), and sometimes, cancer of the vagina. After a hysterectomy, you will be unable to carry a pregnancy and your periods will stop. As your ovaries will continue to function, you may be able to fertilise your eggs through IVF and use a surrogate to carry the pregnancy (see pages 61–62).

Hormone therapy

The hormones oestrogen or progesterone may help some types of breast and uterine cancers to grow. Hormone therapy aims to slow down the growth of these cancers by lowering the amount of hormones the tumour receives.

If a cancer is growing in response to oestrogen or progesterone, the cancer cells will have hormone receptors. These are proteins found on the surface of the cancer cell. There are two types of hormone receptors: oestrogen receptors and progesterone receptors. Cancer cells with hormone receptors on them are said to be hormone receptor positive or hormone sensitive cancers. They are likely to respond to hormone therapy.

Hormone therapy can be used for a short time or long term. As it blocks the hormones that are required for fertility, you will have to wait until hormone therapy is finished to try for a baby. You may be able to store eggs or embryos before starting hormone therapy – see pages 28–29 for more information about this process.

Anti-oestrogen drugs (such as tamoxifen and aromatase inhibitors) are used to reduce the risk that oestrogen-sensitive breast cancers will come back after treatment. Many anti-oestrogen drugs are taken for several years. During this time, pregnancy should be avoided, as there is a risk the drugs could harm an unborn child (see page 24). These drugs do not cause infertility and do not damage the ovaries or eggs.

Hormone therapy and pregnancy

Although hormone treatments for breast cancer are used for many years, it is often possible to take a break from the drugs to try for a baby. If you are on hormone therapy and want to become pregnant, talk to your treatment team or fertility specialist about the advantages and disadvantages of stopping hormone therapy.

Other treatments

Stem cell transplant – High-dose chemotherapy and, possibly, radiation therapy are given before the transplant to kill the cancer cells in the body. The risk of permanent infertility after high-dose chemotherapy or radiation therapy is high.

Immunotherapy and targeted therapy – The effects of these newer drugs on fertility and pregnancy can vary depending on the drug you take. It is important to discuss the potential impact of these drugs with your cancer or fertility specialist.

Avoiding pregnancy during treatment

Some cancer treatments, such as chemotherapy, radiation therapy, immunotherapy or targeted therapy, can harm an unborn baby or cause birth defects.

Even if your periods stop during cancer treatment, you might still be fertile. If you are in a heterosexual relationship you will need to use some form of contraception to avoid pregnancy while having treatment.

Your treatment team and fertility specialists may also advise you

to wait between six months and two years before starting fertility treatment or trying to conceive naturally. This will depend on the type of treatment you've had. For example, some chemotherapy drugs may have damaged any developing eggs.

You may also need to use barrier contraception, such as a condom, female condom or dental dam, to protect your partner from any chemotherapy drugs that may be present in your body fluids.

Fertility outcomes after treatment

If you still have your reproductive organs, you may be able to conceive after cancer treatment without medical assistance. However, about one in three women will experience one of the following physical issues.

Acute ovarian failure

During treatment, and for some time afterwards, the ovaries often stop producing hormones because of the damage caused by the cancer treatment. This is known as acute or temporary ovarian failure. You will have occasional or no periods, and symptoms similar to menopause (see next page), before regular periods return. If ovarian failure continues for several years, it is less likely that your ovaries will work normally again.

Early menopause

Menopause before the age of 40 is known as premature ovarian insufficiency (POI). This is when you stop having menstrual periods because egg numbers are very low. It may also be called early or premature menopause.

POI could occur immediately or many years after treatment depending on your age, type of treatment and the dose of any drugs you received. If the ovaries are surgically removed or too many eggs are damaged during treatment, menopause is permanent.

While menopause means you won't ovulate, it is still possible to carry a baby if you have a uterus and use stored eggs or donor eggs. A small number of women with POI (5–10%) have a chance of becoming pregnant naturally, because in some rare cases, a remaining egg may mature and be fertilised by a sperm.

“ It feels like menopause is discussed as a treatment side effect, not as this massive impact on who you are as a person. I’m facing menopause 20 years earlier than my friends. ” Denise

Most menopause symptoms are related to a drop in your body’s oestrogen levels. Menopause symptoms are usually more severe when menopause starts suddenly, because the body hasn’t had time to get used to the gradual decrease in hormone levels. Symptoms may include a dry or tight vagina; a decreased interest in sex (low libido); hot flushes and night sweats; aching joints; trouble sleeping; dry or itchy skin; and feeling more anxious or overwhelmed.

Some ways to manage menopause symptoms are listed below. For more information, talk to your doctor or ask for a referral to a specialist menopause clinic.

Osteoporosis – Early menopause can cause the bones to weaken (osteoporosis). Talk to your doctor about having a bone density test or taking medicines to prevent your bones weakening. Regular weight-bearing exercise will help keep your bones strong. Osteoporosis Australia has more information – call 1800 242 141 or visit osteoporosis.org.au.

Hot flushes, dry vagina and poor sleep – Menopause hormone therapy (MHT, previously known as hormone replacement therapy or HRT) may help treat these symptoms. MHT replaces the hormones usually produced by the ovaries, and can be taken as tablets, creams

or skin patches. Taking MHT may increase the risk of some diseases. Some women with a hormone-sensitive cancer may be advised not to take MHT, but there are other non-hormonal drugs available that can help. Vaginal moisturisers available over the counter can also help with vaginal discomfort and dryness.

Anxiety – Meditation and relaxation techniques can help reduce stress and lessen anxiety. Cognitive behaviour therapy (CBT) has been shown to be effective in helping women deal with many of the effects of menopause, including anxiety. Exercise can also help with mood changes and energy levels.

- ▶ See our *Emotions and Cancer* and *Understanding Complementary Therapies* booklets.

Your feelings about early menopause

When cancer treatment causes early menopause, the impact on your emotions, body image and relationships can be significant.

If you are younger, experiencing menopause much earlier than expected may affect your sense of identity, or make you feel older than your age or friends. You may feel less feminine and worry that you are less attractive.

If you are older, going through menopause earlier than expected

may be upsetting. But some older women say they feel relieved not having to worry about regular periods.

You may find it difficult to start new intimate relationships after going through menopause. See *Relationships and sexuality* on pages 69–71 for information.

It may take time to accept the changes you're experiencing. Talking to a family member, friend or counsellor may help.



Female options before cancer treatment

This chapter has information about ways you can preserve your fertility before starting cancer treatment. It's ideal to discuss the options with your cancer or fertility specialist at this time. See *Making decisions* on pages 17–19 for more details.

Ask your cancer specialist how long you have to consider your options. In many cases, you can wait a week or two before starting

Preserving fertility in females

Option	What this is	When this is used
wait and see	<ul style="list-style-type: none">when no method is used to preserve fertility	<ul style="list-style-type: none">when you don't have time to consider fertility preservationwhen you choose to start cancer treatment immediately
egg or embryo freezing (cryopreservation)	<ul style="list-style-type: none">the process of collecting, developing and freezing eggs or embryos as part of an in-vitro fertilisation (IVF) cyclesee page 32 for an overview of the IVF process	<ul style="list-style-type: none">when you want to store eggs or embryos for the future – they can be stored for many yearslegal limits on how long eggs and embryos can be stored are different in each state and territoryyour fertility clinic can advise about time limits and the cost of storagewhen you are ready to have a child, the frozen egg will be fertilised using IVF or the embryo will be implanted in your uterus

cancer treatment. Be sure to understand the risks of each fertility option and keep in mind that no method works all of the time.

If you didn't have an opportunity to discuss your options before starting treatment, you can still consider your fertility later, but there may not be as many choices available. See *Female options after cancer treatment* on pages 33–37 for detailed information.

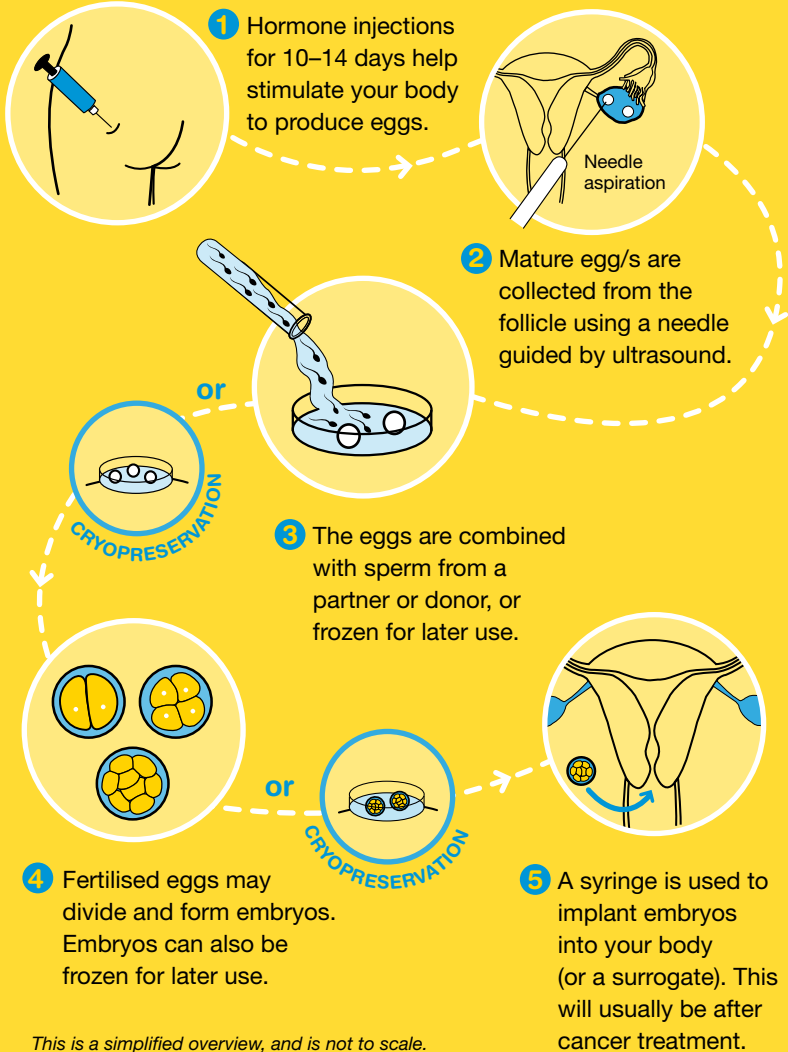
How this works	Considerations	Pregnancy rate
<ul style="list-style-type: none"> requires no action 	<ul style="list-style-type: none"> more likely to lead to premature ovarian insufficiency (see page 25) 	<ul style="list-style-type: none"> depends on age and cancer treatment
<ul style="list-style-type: none"> egg and embryo freezing is part of IVF – the most common and successful method for preserving female fertility one cycle of IVF can take 2–3 weeks egg collection is a minor procedure in an operating theatre 	<ul style="list-style-type: none"> need time to have IVF before cancer treatment – your cancer specialists will advise how quickly treatment should begin don't need to have a partner to freeze eggs to freeze an embryo, you need to have a male partner at both the start and end of treatment, as both partners have to agree to implant the embryo after treatment talk with your fertility specialist about whether to freeze eggs, embryos or a mix of both 	<ul style="list-style-type: none"> freezing eggs is equally as effective as freezing embryos for every 10 eggs frozen, you can expect to get 1–4 embryos depending on age, the success rate of the fertility clinic and the stage the embryos are stored at, there may be a 25–40% chance per cycle of a frozen embryo developing into a pregnancy

Preserving fertility in females – continued

Option	What this is	When this is used
ovarian tissue freezing (cryopreservation)	<ul style="list-style-type: none"> the process of removing, slicing and freezing tiny pieces of tissue from an ovary so it can be used later legal limits on how long ovarian tissue can be stored are different in each state and territory your fertility clinic can advise about time limits and the cost of storage 	<ul style="list-style-type: none"> if there isn't a lot of time before treatment if taking hormones to encourage egg production is unsafe if there is a high risk of infertility if the person hasn't gone through puberty can be used in addition to egg freezing
ovarian transposition (oophoropexy)	<ul style="list-style-type: none"> a type of fertility-sparing surgery it involves surgically moving one or both ovaries to preserve their function 	<ul style="list-style-type: none"> when the ovaries are in the path of radiation therapy
trachelectomy	<ul style="list-style-type: none"> a type of fertility-sparing surgery it removes part or all of the cervix, the upper part of the vagina, and lymph nodes in the pelvis the uterus, fallopian tubes and ovaries are left in place 	<ul style="list-style-type: none"> for small tumours found only in the cervix
GnRH analogue treatment (ovarian suppression)	<ul style="list-style-type: none"> gonadotropin-releasing hormone (GnRH) is a long-acting hormone used to cause temporary menopause reducing activity in the ovaries may protect eggs from being damaged 	<ul style="list-style-type: none"> during chemotherapy

How this works	Considerations	Pregnancy rate
<ul style="list-style-type: none"> tissue is removed from your ovaries during keyhole surgery (laparoscopy); if you have abdominal surgery as part of cancer treatment, tissue can be removed at this time tissue is frozen until needed when you are ready to conceive, some ovarian tissue is thawed and put back (grafted) into the ovary tissue may produce hormones and eggs may develop 	<ul style="list-style-type: none"> there is a risk that storing tissue before treatment begins means it will contain cancer cells, and you may not want to put this tissue back into your body this risk is higher for people with leukaemia it's important to discuss this risk with your doctor 	<ul style="list-style-type: none"> around a third of people who have had ovarian tissue put back have become pregnant to date, about 170 births worldwide from ovarian tissue removed after puberty and several births from ovarian tissue removed before puberty
<ul style="list-style-type: none"> one or both ovaries are moved away from the field of radiation and stitched in place this may lower the amount of radiation your ovaries receive 	<ul style="list-style-type: none"> may cut off blood supply, causing loss of ovarian function not always successful 	<ul style="list-style-type: none"> depends on your age, the amount of radiation that reaches the ovaries and if you start menstruating again
<ul style="list-style-type: none"> the cervix is partially or completely removed, but the uterus is left in place and stitched partially closed this opening is used for menstruation and for sperm to enter 	<ul style="list-style-type: none"> you will be at higher risk of having a miscarriage and having the baby prematurely you may have a stitch placed in what remains of the cervix to reduce the risk 	<ul style="list-style-type: none"> it is possible to become pregnant after a trachelectomy
<ul style="list-style-type: none"> you will have hormone injections 7–10 days before cancer treatment starts or during the first week of treatment injections continue every four weeks until cancer treatment has finished 	<ul style="list-style-type: none"> may be recommended as a backup to other fertility options or as the only method used to help prevent loss of ovarian function can affect bone density so may need menopause hormone therapy if used for more than six months 	<ul style="list-style-type: none"> studies show this treatment may help some people

How in vitro fertilisation (IVF) works





Female options after cancer treatment

Fertility options after cancer treatment may be limited. Your ability to become pregnant depends on the effects of cancer treatment on fertility, your age and whether you have been affected by premature ovarian insufficiency or early menopause (see pages 25–27). Options include:

- conceiving naturally (see below)
- using eggs or embryos you harvested and stored before treatment, either implanted into your body (see pages 28–29) or a surrogate (see pages 61–62)
- freezing eggs or embryos after treatment ends for later use (if your ovaries are still working)
- using donor eggs or embryos (see pages 34–35).

Before trying to conceive, you may want to have your fertility checked. See *Assessing fertility after treatment* on pages 57–60.

Natural conception

You may be able to conceive naturally after finishing cancer treatment. This will only be possible if your ovaries are still releasing eggs and you have a uterus. Your medical team will do tests to assess your fertility and check your general health, and will encourage you to try for a baby naturally if they think it may be possible for you to get pregnant. Depending on the treatment you've had, they may advise you to wait between six months and two years before trying to conceive. Discuss the timing and suitable contraception with your specialist.

Even if your periods return after chemotherapy or pelvic radiation therapy, there is a high risk of early menopause. If menopause is permanent, it means you will no longer be able to conceive naturally.

Donor eggs and embryos

If you have early menopause after cancer treatment and have a healthy uterus, you may be able to use donor eggs or embryos to try for a pregnancy. Donors cannot be paid but may receive reimbursement for medical expenses.

It can be difficult to find donor eggs and embryos, and you may have to go on a waiting list. You may be able to use donor eggs or embryos from overseas, however, there are strict rules about importing them into Australia. Laws about donor eggs and embryos vary across Australia and may change. Talk to your fertility specialist or a lawyer to obtain specific advice for your situation.

Finding information about the donor

In Australia, clinics can only use eggs and embryos from donors who agree that people born from their donation can find out who they are. This means that the donor's name, address and date of birth are recorded.

All donor-conceived people are entitled to get identifying information about the donor once they turn 18.

In some states, a central register is used to record details

about donors and their donor-conceived offspring. Parents of donor-conceived children, and donor-conceived people who are over the age of 18, can apply for information about the donor through these registers. In other states and territories, people who want information about their donor can ask the clinic where they had treatment.

It is important to discuss possible issues for donor-conceived children with a fertility counsellor.



Other options such as transplants of the uterus are being studied in clinical trials. Talk to your doctor about the latest research and whether there are any suitable clinical trials for you.

Using donor eggs

You will need to find your own donor eggs. Your fertility clinic may have an egg bank or you can ask a family member or friend to donate eggs. All donors are required to have blood tests, answer questions about their genetic and medical information, and have counselling.

After the eggs are collected from the donor, they are combined with sperm from your partner or a donor using IVF (see page 32). The embryo will be frozen for a few months and then screened for any infectious diseases before it is transferred into your uterus.

Egg donation is more expensive than standard IVF, as you may have to cover hormone-related costs to encourage egg production in the donor.

Using donor embryos

Donor embryos usually come from people who still have frozen embryos after they've had successful IVF treatment. Embryos may be donated for ethical reasons (instead of discarding the embryos) or compassionate reasons (to help someone with infertility).

If you use a donated embryo you will take hormones to prepare your uterus for pregnancy. When your body is ready, the embryo will be thawed and implanted into your uterus using IVF (see page 32).



Sophie's story

After I was diagnosed with chronic leukaemia, I still wanted to pursue fertility, so I discussed this with a fertility doctor.

For the last couple of years, I've been on a drug that has done really well for me. As the cancer has been undetectable for the last four tests, we're hoping in the next few months to stop treatment and try again with a donor embryo.

The fertility clinic couldn't really help us find donor eggs, so we went through a national egg donor organisation. We met our donor through one of their monthly get-togethers. We now have four embryos waiting for us to use.

The organisation is for people at all points in the fertility process, from just starting through to going to meetings so their children can meet other children who were made through egg donation.

The group also has an active support group forum. I learnt a lot about IVF through this forum and there's a lot of emotional support.

There are quite a few people who have lost fertility due to cancer, but the majority are there due to non-cancer infertility.

Because we've been through the process a few times, I'm a little circumspect in terms of committing to thinking I'll get pregnant. I want to make sure that I do all the right things so that if it doesn't happen, I know I've tried everything.

One of the things I don't like about the situation is that I've got to do a lot of planning in case I get pregnant – what happens if I relapse, what treatments are available, would they induce early. Yet, I'm still nervous about whether I can get pregnant. The multiple goal setting has been quite difficult.



Key points about female fertility

Fertility and cancer treatments

- Cancer treatments may damage the ovaries or other reproductive organs, decrease the number of available healthy eggs, affect hormone production or remove some of the reproductive organs.
- The effects of cancer treatment on fertility may be temporary or permanent. It is important to discuss your fertility options with your cancer treatment team or fertility specialist before starting treatment.
- You will be advised to avoid becoming pregnant during cancer treatment and for six months to two years afterwards.

Fertility options before cancer treatment

- Eggs and embryos can be frozen as part of in-vitro fertilisation (IVF).
- Ovarian tissue can be removed and frozen, and then put back into the ovary when you are ready to conceive.
- Hormone treatments, known as ovarian suppression, may help to protect your fertility.

Fertility options after cancer treatment

- If you have eggs and a uterus, you may be able to conceive naturally.
- If you stored eggs or embryos before treatment, you may choose to use them.
- If your ovaries are still functioning, you may be able to freeze eggs or embryos.
- If you can't use your own eggs, you may be able to use donor eggs or embryos.
- If you are unable to carry a pregnancy, you may be able to use a surrogate (see page 61).



Male fertility and cancer treatments

This chapter provides an overview of how cancer treatments may affect male fertility. The most common treatments for cancer are chemotherapy, radiation therapy, surgery and hormone therapy. Other treatments include immunotherapy and targeted therapy.

Chemotherapy

Chemotherapy uses drugs to kill or slow the growth of cancer cells. These drugs travel throughout the body and are designed to affect fast-growing cells such as cancer cells. This means they can also damage other cells that grow quickly, including the reproductive cells.

Chemotherapy drugs can lower or stop sperm production for a while. Sperm production often returns to normal, but this may take several years. The drugs may also reduce the ability of sperm to move or alter the sperm's genetic make-up. The risk of infertility depends on:

- **the drugs used** – some types of chemotherapy drugs are more likely to damage sperm production than others
- **the dose you are given** – the risk of damage to sperm increases with higher doses and longer treatment times
- **your age** – the quality of sperm decreases with age and you are less likely to recover fertility if you are over 40.

The effects of chemotherapy on sperm production may be temporary or permanent. Chemotherapy can cause permanent infertility if the cells in the testicles are too damaged to produce healthy, mature sperm again. If you are treated with both chemotherapy and radiation therapy (chemoradiation), the risk of infertility is higher.

Radiation therapy

Radiation therapy (also called radiotherapy) uses a controlled dose of radiation to kill cancer cells or damage them so they cannot grow and multiply. It can be delivered from outside the body (external beam radiation therapy) or inside the body (usually brachytherapy).

Radiation therapy may cause infertility. The risk of infertility will vary depending on the area treated, the dose and number of treatments.

- External radiation therapy to the pelvic area (for prostate, rectal, bladder or anal cancer and some childhood leukaemias) or near the testicles may affect sperm production. This often returns to normal after a few months. Depending on the dose and the area of the pelvis treated, you may also have problems getting and keeping erections, and ejaculation may be painful for a few weeks after treatment.
- Radiation therapy to the brain may damage the pituitary gland, affecting the production of sperm and sex drive.
- Brachytherapy seed implants used for prostate cancer may affect sperm production, but many men recover.

Avoiding pregnancy during treatment

Some cancer treatments, such as chemotherapy or radiation therapy, may affect sperm and cause birth defects. As you may still be fertile during treatment, you will need to use contraception or not have penetrative sex to avoid conceiving during treatment.

Surgery

Surgery aims to remove the cancer from the body. Surgery to remove part or all of a sex organ or organs in the surrounding area (such as the bladder), may affect your ability to conceive a child.

Removal of the testicles (orchidectomy) – Most men who have had one testicle removed can go on to have children naturally. However, men with testicular cancer have lower fertility rates than the general population. The urologist may advise you to store some sperm at a sperm banking facility before the surgery, just in case you have fertility problems in the future (see pages 44–45). In some rare cases, both testicles are removed (bilateral orchidectomy). This causes permanent infertility because you will no longer produce sperm. You will still be able to get an erection.

Removal of the prostate (prostatectomy) – During surgery to remove the prostate and seminal vesicles, the tubes from the testicles (vas deferens) are sealed. This causes permanent infertility because you will not be able to ejaculate semen during orgasm. This is known as a dry orgasm (see opposite page).

The prostate lies close to nerves and blood vessels that are important for getting erections. These may be damaged during surgery, but the impact on erections depends on the strength of your erections before surgery. In some cases, semen may go back towards the bladder instead of forward into the penis (retrograde ejaculation, see opposite page).

Removal of the penis (penectomy) – Part or all of the penis may be removed to treat penile cancer. The part of the penis that

remains may still get erect with arousal and may be long enough for penetration. It is sometimes possible to have a penis reconstructed after surgery, but this is still considered experimental and would require another major operation.

Nerve damage – Surgery for bladder, prostate or testicular cancer may damage the nerves used for getting and keeping an erection (erectile dysfunction). This may last for a short time or be permanent. It may be possible for the surgeon to use a nerve-sparing surgical technique to protect the nerves that control erections. This works best for younger men who had strong erections before the surgery. However, problems with erections are common even with nerve-sparing surgery.

Managing side effects of surgery

Dry orgasm – You will not be able to conceive a child without medical assistance. You may be able to have a procedure to retrieve some sperm from the testicles (testicular sperm extraction, see pages 44–45).

Retrograde ejaculation – You may be given medicine to help the semen move out of the penis as normal. This may make it possible for you to conceive naturally. Your fertility specialist can also collect some ejaculated sperm from

the urine, which can be used to fertilise eggs during IVF.

Erection problems – If surgery has damaged the nerves that help control erections, there are several medical options you can try. These include prescription medicine and erectile aids which may make it possible for you to conceive naturally. If you are not able to have sexual intercourse, you may be able to have testicular sperm extraction to help you conceive (see pages 44–45).

Hormone therapy

The hormone testosterone helps prostate cancer to grow. Slowing the body's production of testosterone and blocking its effects may slow the growth of the cancer or even shrink it. This may cause infertility. Males with breast cancer who are taking the drug tamoxifen (an anti-oestrogen drug) may experience increased sperm production.

Other treatments

Stem cell transplant – High-dose chemotherapy and, possibly, radiation therapy are given before the transplant to kill the cancer cells in the body. The risk of permanent infertility after high-dose chemotherapy or radiation therapy is high.

Immunotherapy and targeted therapy – The effects of these newer treatments on fertility and sperm production vary depending on the drug you take. It is important to discuss the potential impact of these drugs with your cancer or fertility specialist.

Fertility outcomes after treatment

Semen production often returns to normal after a few months and some males are able to conceive after cancer treatment without medical assistance. Erectile function can also continue to improve for up to three years after treatment has finished.

For other males the effect on sperm production and ability to have erections is permanent and causes infertility. It may take time to accept this – the *Emotional impact* chapter on pages 65–67 may help.



Male options before cancer treatment

This chapter has information about ways you can preserve your fertility before starting cancer treatment. It's ideal to discuss the options with your cancer or fertility specialist at this time. See *Making decisions* on pages 17–19 for more details.

Some choices, such as sperm banking and radiation shielding, are well-established ways to preserve fertility. Surgically extracting sperm from the testicles is another way to store sperm for later use. The option that is right for you depends on the type of cancer you have and your personal preferences.

Ask your cancer specialist how long you have to consider your options. In many cases, you can wait a week or two before starting cancer treatment. Fertility treatments carry some risks and your doctor should discuss these before you go ahead. Keep in mind that no method works all of the time.

If you didn't have an opportunity to discuss your options before starting cancer treatment, you can still consider your fertility later. Your choices after treatment will depend on whether you are able to produce sperm. See *Male options after cancer treatment* on pages 47–51 for detailed information.

“All my life I had wanted to be a father. I didn't want cancer to ruin my chances, so I stored my sperm before treatment started. I think of this as a bit of an insurance policy.” Zac

Preserving fertility in males

Option	What this is	When this is used
sperm banking or sperm freezing (cryopreservation)	<ul style="list-style-type: none">• collecting, freezing and storing sperm• this is the standard way of preserving fertility in males	<ul style="list-style-type: none">• when you want to store sperm for the future• samples can be stored for up to 20 years• legal limits on how long sperm can be stored are different in each state and territory• your fertility clinic can advise about time limits and the cost of storage
radiation shielding	<ul style="list-style-type: none">• protecting the testicles from external beam radiation therapy with a shield	<ul style="list-style-type: none">• if the testicles are close to where radiation beams are directed (but are not the target of the radiation), they can be protected from the radiation beams
testicular sperm extraction (TESE)	<ul style="list-style-type: none">• a method of looking for sperm inside the testicular tissue• also called surgical sperm retrieval	<ul style="list-style-type: none">• when you can't ejaculate• when there is not enough sperm in the semen sample

How this works	Other considerations
<ul style="list-style-type: none"> the procedure is performed in hospital or in a sperm bank facility (also called an andrology unit) samples are collected in a private room where you can masturbate or have a partner sexually stimulate you and then ejaculate into a jar it's recommended that you provide 2–3 samples; you may need to visit the clinic more than once to ensure an adequate amount of semen is collected sperm is then frozen until needed when you are ready to have a child, the frozen sperm is thawed and used to fertilise an egg using IVF 	<ul style="list-style-type: none"> if you collect semen at home, you must keep the sample close to body temperature and get it to the sperm bank facility within an hour if you want to collect semen during sex, you must use a special condom you can get from the sperm bank facility if you are unable to ejaculate, there are medical ways to encourage ejaculation if you are unable to produce a sample of semen, sperm may be collected using testicular sperm extraction sperm can also be collected from men with retrograde ejaculation you may feel nervous and embarrassed going to a sperm bank, or worry about achieving orgasm and ejaculating; the medical staff are used to these situations; you can also bring someone with you
<ul style="list-style-type: none"> protective lead coverings called shields are used 	<ul style="list-style-type: none"> this technique does not guarantee that radiation will not affect the testicles, but it does provide some level of protection
<ul style="list-style-type: none"> under anaesthetic, a fine needle is inserted into the epididymis (see page 8) or testicle to find and extract sperm; this is called testicular aspiration if no sperm is found, your specialist may do an open biopsy to retrieve a larger tissue sample collected sperm is frozen and can later be used to fertilise eggs during IVF 	<ul style="list-style-type: none"> rarely, no sperm is found in the testicular tissue



Harry's story

When I was 25, I'd been feeling quite ill – I had back pain, night sweats and weight loss. I was diagnosed with advanced Hodgkin lymphoma.

The doctors recommended I bank sperm immediately, because fertility would be an issue post-treatment. Fertility wasn't my main concern. However, my partner – now wife – and I were together at that point, so we knew it could be an issue for us down the track.

I banked sperm the week before chemotherapy even started. My chemotherapy regimen was aggressive, but the cancer went into remission. The chemo permanently reduced my testosterone levels. I've taken supplements for years, and I will be on them for quite some time. However, the supplements didn't restore my fertility.

Years later, my wife and I tried artificial insemination using my banked sperm. When that didn't work, we tried IVF. We found

the process emotionally and financially draining. The first cycle was unsuccessful. We told ourselves if a second IVF cycle didn't work, we were going to give up for a while. Being told we were pregnant was one of the happiest days of our lives.

We now have a beautiful child, and we've decided we don't want to do more IVF – it's financially and emotionally draining. Even though we have no intention of using it, my remaining sperm is still stored. We were advised to keep it until my wife reaches a certain age – I guess in case we change our minds.

At times, I've felt responsible for everything. My wife is a healthy woman and probably capable of conceiving a pregnancy naturally, but she had to go through IVF. Our son asks why he can't have a brother or sister. But it's something we've accepted. We feel blessed now with one child – the result was worth everything we went through.



Male options after cancer treatment

After cancer treatment, your medical team will analyse a sample of your semen to assess how many sperm you are making, how healthy they look and how well they move (motility). See *Assessing fertility after treatment* on pages 57–60 for more details.

Depending on the results of these tests, your options include:

- conceiving naturally (see below)
- artificial insemination or IVF using your own sperm frozen before treatment or fresh sperm collected after treatment (see page 48)
- testicular sperm extraction, if you can't ejaculate normally or there is no sperm in the semen (see pages 44–45)
- banking sperm after treatment ends, if you are still fertile
- using donor sperm (see pages 49–50)
- using a surrogate to carry an embryo created with your own or donor sperm (see pages 61–62).

Natural conception

You may be able to get your partner pregnant naturally after finishing cancer treatment. This will only be possible if your semen production returns to normal and you are making healthy, active sperm. As fertility declines with age, it will also depend on the age of you and your partner. If treatment has permanently affected your ability to produce sperm and have erections, you will no longer be able to conceive naturally.

Your medical team will do tests to assess your fertility and check your general health. Depending on the treatment you've had, they may advise you to wait six months to two years before trying to conceive. Discuss the timing and suitable contraception with your specialist.



The pituitary gland produces hormones that tell the testicles to produce sperm. If cancer treatment has damaged the pituitary gland, you may be able to have medical treatment to trigger the production of sperm. This is called sperm induction.

Intrauterine insemination (IUI)

Also called artificial insemination, this technique increases the chance that the sperm will fertilise an egg by placing the sperm directly into the uterus. The sperm may be fresh or it may have been frozen before treatment. To be used for IUI, sperm samples must be of reasonable quality. The sample is washed and the faster-moving sperm are separated from the slower sperm.

Insemination is usually done in a fertility clinic. Once your partner is ovulating, the sperm are inserted into her uterus through the cervix using a small, soft tube (catheter). This takes only a few minutes and may cause some mild discomfort to your partner. You should know in a few weeks whether fertilisation took place.

In-vitro fertilisation (IVF)

IVF uses either sperm collected and frozen before treatment or fresh sperm to fertilise an egg outside of the body. Intracytoplasmic sperm injection (ICSI) is a specialised type of IVF in which a single, good-quality sperm is injected into an egg. See pages 28–29 for more information about the general IVF process and page 32 for a diagram of how IVF works, or ask your fertility specialist to explain the process.

Donor sperm

If you are infertile after cancer treatment, using donor sperm is another way to become a parent. This is general information about donor sperm. Laws vary across Australia and may change. Talk to your fertility specialist to obtain specific advice about your situation.

You can ask a friend or family member to donate sperm, or you can get sperm from someone you don't know. Fertility clinics in Australia may have access to donor sperm or you can advertise for your own donor. There is a lot of demand for donor sperm so you may have to go on a waiting list. You may also be able to use sperm from overseas. However, there are strict rules about importing donor sperm into Australia.

Finding information about the donor

In Australia, clinics can only use sperm from donors who agree that people born from their donation can find out who they are. This means that the donor's name, address and date of birth are recorded.

All donor-conceived people are entitled to get identifying information about the donor once they turn 18.

In some states, a central register is used to record details

about donors and their donor-conceived offspring. Parents of donor-conceived children, and donor-conceived people who are over the age of 18, can apply for information about the donor through these registers. In other states and territories, people who want information about their donor can ask the clinic where they had treatment.

It is important to discuss possible issues for donor-conceived children with a fertility counsellor.

Using donor sperm

Sperm donors have voluntarily contributed sperm to a fertility clinic. They are not paid for their donation, but may receive reimbursement for travel or medical expenses. The donors are usually aged 21–45.

All donors are required to complete health tests and go through a counselling process. Personal information is also collected, including:

- 2–4 generations of family medical history
- details about their ethnicity, educational background, hobbies, skills and occupation
- health information, including infectious diseases status, drug use and blood type.

Samples are screened for genetic diseases or abnormalities, sexually transmitted infections (STIs) and overall quality, then quarantined for several months. Before the sperm is cleared for use, the donor is checked again for infectious diseases.

The sperm is frozen and stored in liquid nitrogen in individual containers. When the sperm is ready to be used, insemination is usually done in a fertility clinic. The sample is thawed to room temperature and inserted directly into the uterus using IUI or combined with an egg using IVF (see page 48).



Some states and territories may have a limit on the number of people who can have children from the same sperm donor, including the donor's partner. Talk to your fertility clinic for more information.



Key points about male fertility

Fertility and cancer treatments

- Cancer treatments may reduce or stop sperm production, damage or remove the reproductive organs, affect hormone production or affect the ability to get an erection and ejaculate.
- The effects of cancer treatment on fertility may be temporary or permanent. It is important to discuss your fertility options with your cancer treatment team or fertility specialist before starting treatment.
- You will be advised to avoid conceiving during cancer treatment and for a period of time afterwards.

Fertility options before cancer treatment

- Sperm banking involves freezing some sperm for later use. It is an easy and effective way of preserving fertility.
- Testicles can be shielded during radiation therapy to reduce the chance of the radiation causing harm.
- Sperm can be surgically removed from the testicular tissue (testicular sperm extraction).

Fertility options after cancer treatment

- If you are making healthy, active sperm, you may be able to conceive naturally.
- If you stored sperm before treatment, you may choose to use it to fertilise an egg with the help of artificial insemination or in-vitro fertilisation.
- You may be able to have medical treatment to trigger sperm production (sperm induction).
- If you can't use your own sperm, you may be able to use donor sperm.



Preserving fertility in children and adolescents

When a child or adolescent is diagnosed with cancer, there are many issues to consider. Often the focus is on survival, so children, teens and parents may not immediately think about fertility. However, the majority of young people survive cancer, and fertility may become important as they reach puberty (sexual maturity) and adulthood.

Some cancer treatments do not affect a child's reproductive system. Others can damage the ovaries, which contain eggs, or the testicles, which make sperm. Sometimes this damage is temporary, but sometimes it's permanent. For a general overview of how cancer treatments affect fertility, see *Female fertility and cancer treatments* on pages 20–27 or *Male fertility and cancer treatments* on pages 38–42. You can also talk to the health care team about how cancer treatment will affect fertility.

For an overview of ways to prevent or lower the risk of infertility, see pages 54–55. Some of these procedures are experimental and available only in specialised centres. In many cases, decisions about fertility preservation are made before treatment begins. This is a difficult time, and often the decision involves specialists, the young person and their parents or carers. Parents of young children under 18 will usually need to consent to any fertility preservation procedures.



The National Ovarian and Testicular Tissue Transport and Cryopreservation Service allows young people to have their ovarian or testicular tissue harvested by their own fertility specialist and then transported for storage at the national cryo-bank at the Royal Women's Hospital Melbourne.



Ben's story

I was diagnosed with leukaemia when I was 13. I had six weeks of chemotherapy followed by a bone marrow transplant. After this, the doctors checked my fertility and told me I was sterile.

Obviously I wasn't thinking of having kids at that age, but the possibility of not being able to made me pretty upset. It sent me into a bit of a depression spiral.

Now when I talk about my diagnosis and fertility comes up, I still get upset. It's patronising as well because a lot of people, even family members, say things like, "Oh you can still adopt". But to me, it's not the same.

I'm 20 now and I have a girlfriend. After we'd been going out for two years, I asked her if our

relationship was to go any further and we couldn't have kids, would that be an issue? She didn't seem to have a problem with it.

But I've still got it in my mind that if I do find someone and it gets to that time, and I say, "Oh, I can't have kids," they're just going to get up and go.

My brother told me that he was trying for a baby and that made me feel sort of shit, but at the same time I was happy for him.

After my treatment, the doctors said they'd give me more information later, so I'm waiting to hear about my other options. There are other ways of having kids, so I've got to wait and see what happens. No point getting worked up about it yet.

Resources for young people

CanTeen's resource *Maybe later baby?* provides age-appropriate information about the impact of cancer on fertility. To download a copy of the book, visit canteen.org.au and search for the resource. You can also find information specific to children and adolescents at futurefertility.com.au.

Preserving fertility in young females

The options will depend on whether the young person has been through puberty. Most young females go through puberty between the ages of 8 and 13.

before puberty

Removing and freezing ovarian tissue. This is called ovarian cryopreservation (see pages 30–31). When needed, the tissue is put back into the body. The ovarian tissue contains underdeveloped immature eggs. Experiments are being done to mature the eggs in a laboratory before freezing, but this technique is under development and not widely available. There have been several births worldwide from ovarian tissue removed before puberty.

after puberty

- Collecting and freezing mature eggs or ovarian tissue (cryopreservation, see pages 28–31).
- Taking a long-acting hormone called GnRH may reduce activity in the ovaries or ovarian tissue and protect eggs from damage (see pages 30–31).
- Checking hormone levels to assess fertility (see pages 57–58). Young females may be fertile, but go through early menopause.

before or after puberty

- Shielding the abdominal area during radiation therapy to the pelvis to provide some level of protection to the ovaries.
- Surgically moving the ovaries away from the field of radiation (ovarian transposition, see pages 30–31). If the ovaries aren't protected, the risk of ovarian failure is higher (premature ovarian insufficiency, see page 25).

Preserving fertility in young males

The options will depend on whether the young person has been through puberty. Most young males go through puberty between the ages of 9 and 14. After puberty, semen contains mature sperm.

before puberty

- There are no proven fertility preservation methods for young males who have not gone through puberty.
- Freezing testicular tissue (testicular tissue cryopreservation) is being tested with young boys at high risk of infertility. Tissue that contains cells that make sperm is removed from the testicles through a small cut. This technique is not widely available and is still considered experimental.

after puberty

- Sperm banking (cryopreservation) can be used to collect, freeze and store mature sperm for later use with IVF (see pages 44–45).
- Testicular sperm extraction (see pages 44–45) can remove sperm cells from the testicles, which are frozen and stored for later use with IVF. This technique is not widely available.
- Having tests to assess fertility (see pages 58–60). Young males may have erections and ejaculate, but not be fertile.

before or after puberty

- Shielding the testicles with protective lead coverings during radiation therapy to the pelvis provides some level of protection. If this area is not protected, sperm production may be affected, which could cause infertility.



Key points about young people and fertility

Fertility and cancer treatments

- While some cancer treatments do not affect a child's developing reproductive system, others can damage the ovaries or the testicles.
- This damage may be temporary or permanent.
- Parents or carers of children under 18 will usually need to consent to any fertility preservation procedures.
- Fertility-preserving options will depend on whether the child has been through puberty. The decision will often be shared between the parent, young person and doctor.

Fertility options before puberty

- For young females, ovarian tissue can be removed and frozen and then put back when needed (ovarian cryopreservation).
- For young males, the only available option is still experimental. Tissue from the testicles is removed, frozen and stored. This is called testicular tissue cryopreservation. When needed, the tissue is thawed for later use with IVF.

Fertility options after puberty

- For young females, it may be possible to remove and freeze mature eggs. Some are able to take GnRH to reduce activity in the ovaries or ovarian tissue and protect eggs from damage.
- For young males, it may be possible to collect, freeze and store mature sperm for later use. This is known as sperm banking.



Assessing fertility after treatment

After cancer treatment, you may want to do some tests to see how your fertility has been affected. The results will help the specialist recommend the best options for having a child after cancer treatment.

If you weren't able to preserve your fertility before starting cancer treatment, you may still be able to do this after treatment. In this case, it is better to have any fertility tests soon after cancer treatment ends. Otherwise, you may decide to wait until you feel physically and emotionally prepared to know the results – this may be months or even years later. A partner, friends, family or your medical team might provide support to you when you receive the results.

Fertility tests for females

Your fertility specialist or reproductive endocrinologist can organise a number of tests to assess your likely fertility status after treatment.

Follicle-stimulating hormone (FSH) – A blood test can measure the hormone FSH, which may indicate how close to menopause you are. This hormone is produced in the pituitary gland, and stimulates the follicles in the ovaries, which will in turn release eggs. FSH levels need to be measured on specific days of the menstrual cycle – usually the first couple of days – as levels change throughout the month.

Transvaginal ultrasound – An ultrasound uses echoes from soundwaves to create a picture of the cervix, uterus, fallopian tubes and ovaries. A technician will insert an ultrasound wand into the vagina. It will be covered with a disposable plastic sheath and gel to make it easier to insert.

Antral follicle count (AFC) – An ultrasound wand is inserted into the vagina to show the number of follicles in the ovaries. Each follicle contains a single immature egg.

Ovarian size – An ultrasound probe is inserted into the vagina to show the size of the ovaries. Smaller ovaries usually contain fewer eggs, which may make it more challenging to become pregnant.

Anti-Müllerian hormone (AMH) – This blood test measures AMH, which is a hormone secreted by the developing egg sacs (follicles). The level of AMH in the blood is only an estimate of the number of eggs left in the ovaries. It does not reflect egg quality or the ability to have a baby. AMH is usually low after cancer treatment but sometimes increases after you've recovered from chemotherapy.

Oestrogen (oestradiol) – This is produced mainly in the ovaries. The level of oestradiol rises and falls throughout the menstrual cycle so a single measurement does not give good information about fertility.

Luteinising hormone (LH) – A blood test can measure LH levels. This hormone helps the ovaries release an egg. High levels of LH may be a sign that your ovaries have stopped working (premature ovarian insufficiency, see page 25).

Fertility tests for males

After treatment, you may be able to have an erection and ejaculate, but this doesn't necessarily mean you are fertile.



If you stored sperm in a sperm bank before cancer treatment, your doctor can compare this sample to your sperm sample after treatment.

Semen analysis (sperm count) – This test can show if you are producing sperm and, if so, how many there are, how healthy they look and how active they are. You will go into a private room and masturbate until you ejaculate into a small container. The semen sample is sent to a laboratory for analysis. The results will help the fertility specialist determine whether you are likely to need help to conceive.

Follicle-stimulating hormone (FSH) – A blood test can measure FSH. This hormone is produced in the pituitary gland. In males, FSH encourages sperm production.

If FSH levels are higher than normal, this is a sign that fewer sperm are being produced. If FSH levels are lower than normal, this indicates that the pituitary gland is damaged. This will affect the number of sperm produced. This does not necessarily mean that sperm production is too low for a pregnancy but it is a sign of whether or not fertility has been affected.

Luteinising hormone (LH) and testosterone – A blood test can measure LH and testosterone levels. LH is important in fertility, because it maintains the amount of testosterone that is produced by the testicles. This also helps with sperm production, muscle strength and general sexual health including sex drive (libido).

Like many hormones in the body, LH and testosterone levels are different at different times of the day. They are highest in the morning, so the test is done earlier in the day. It is important to tell your doctor whether or not you've been using marijuana, as this will lower LH and testosterone levels.

If cancer genes are present

A small number of people have a greater risk of developing certain cancers, such as breast, ovarian or bowel cancer, because they carry a changed gene. You can discuss the risk of any future children inheriting one of these changed genes with your doctor or a genetic counsellor.

If your cancer specialist has identified a gene that may have contributed to the growth of the cancer, you may consider having a pre-implantation genetic diagnosis (PGD) test as part of IVF. While the embryos are developing in the laboratory, a few cells are removed from each embryo and tested for genetic conditions. Embryos that are PGD-tested will be frozen until the results are available. Only unaffected embryos are implanted into the uterus, reducing the chance of the faulty gene being passed onto the child. You can discuss this option with your fertility specialist.



If you are concerned about your family history of cancer, visit a familial cancer centre for advice. To find a familial cancer clinic, visit the Cancer Council Australia website at [cancer.org.au](https://www.cancer.org.au) and search for “family cancer clinics”.



Other paths to parenthood

Giving birth yourself or having your partner become pregnant aren't the only ways to become a parent. This chapter talks about other paths to parenthood you may want to consider, including surrogacy, adoption and fostering.

Surrogacy

Surrogacy may be an option if you are unable or do not wish to carry a pregnancy. For example, you may choose a surrogate to carry your embryo if you do not have a uterus or you have been advised that it is medically too risky to carry a pregnancy.

In Australia, a surrogate is a healthy female who carries a donated embryo to term. The surrogate cannot use her own eggs. The embryo can be created from the egg and sperm from the intended parents or a donor. The embryos are implanted into the surrogate's uterus through IVF (see pages 28–29).

In Australia, it is illegal to advertise for someone to act as a surrogate or to pay a surrogate for her services. Non-commercial or altruistic surrogacy is legal. It's common for people to ask someone they know to be the surrogate. If surrogacy is an option, you may need to cover the surrogate's medical costs and other reasonable expenses.

Surrogacy is a complex process for everyone involved. The fertility clinic organising it ensures that both the donor and surrogate go through counselling and psychiatric testing before the process begins. An ethics committee may also have to approve your case. This ensures that all parties make a well-informed decision. The Victorian



This is general information about surrogacy. Laws vary across Australia and may change. Check with your local fertility clinic for the current legislation in your state or territory. It's best to consult a lawyer before entering into a surrogacy agreement.

Assisted Reproductive Treatment Authority provides a lot of useful information about surrogacy, including a helpful domestic surrogacy arrangement legal checklist, at varta.org.au.

Paid surrogacy is legal in some countries overseas. However, in some Australian states and territories it is a criminal offence for residents to enter into commercial surrogacy arrangements overseas – you will need to check that it is legal in your state or territory. It is also important to seek independent legal advice about parentage, citizenship and any conditions you and the surrogate have to meet. For more information on international surrogacy, visit smarttraveller.gov.au.

Adoption and fostering

Adoption involves becoming the legal parent of a child who is not biologically yours and looking after them permanently. Although the number of adoptions in Australia each year is low, you may be able to adopt a child within Australia or from an overseas country.

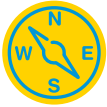
Fostering (foster care) means taking responsibility for a child without becoming the legal parent. Types of foster care include emergency, respite, short-term and long-term care. In Australia, there are more opportunities to foster than to adopt.

Most adoption and fostering agencies say they do not rule out adoption or fostering for cancer survivors on the basis of their medical history. However, all applicants must declare their health status. The agency may also speak directly with your doctor and require you to have a medical examination. The intention is to determine the risk of the cancer returning and your capacity to raise a child.

Applicants for adoption and fostering must also be willing to meet other criteria. The agency from your state or territory may send a representative to assess your home, and you will have a criminal record (background) check. The process depends on where you live and if the child is from Australia or overseas.

For more information about adoption and foster care, visit the family and community service government website in your state or territory. For a guide to overseas adoption, visit the Australian Government's website at intercountryadoption.gov.au or call 1800 197 760.

“ I was treated for cancer about 50 years ago when I was a toddler and the radiation therapy damaged my ovaries. After I married, I tried fertility drugs but didn't have a viable pregnancy. We then applied for adoption. After a five-year wait, we received my daughter at seven weeks old. She was my baby from the minute I laid eyes on her. ” *Sylvia*



Not having a child

If fertility treatment is not successful, you may come to accept that you won't have a child. You might feel like you ran out of time, money or energy to keep trying to have a child. Not being able to have a child after cancer treatment may cause a range of emotions, including:

- sadness or emptiness
- a sense of grief or loss
- anger that cancer and its treatment caused changes to your body
- relief, contentment or happiness
- empowerment, if you chose not to pursue the goal of having children.

You may feel a sense of loss for the life you thought you would have. It can take time to accept that you won't have a child and learn to enjoy the benefits of being child-free – more time to follow other aspects of your life, focus on your relationships, advance your career or afford a different lifestyle. Many people have happy and fulfilling lives without children, or gain satisfaction from other types of nurturing.

Your feelings may change over time. They may also depend on if you have a partner and how they feel. If you want support, a counsellor, social worker or psychologist can talk to you about being child-free and help you deal with challenging situations (for example, if your partner feels differently to you). See also pages 66–67 for some tips on dealing with unhelpful comments from other people and other ways to find support.

●● I learnt that you can live a fulfilled life without children. ●● *Duncan*



Emotional impact

How people respond to infertility varies. It's common to experience a range of emotions, and at times it may feel like you're on an emotional roller-coaster.

Common reactions include shock at the diagnosis and its impact on fertility, grief and loss of future plans, anger or depression from disruption of life plans, uncertainty about the future, loss of control over life direction, and worry about the potential effects of early menopause (such as reduced bone density).

These feelings may be intensified by the physical and emotional process of infertility treatment, and by not knowing if it will work. People who didn't get a chance to think about their fertility until treatment was over say the emotions can be especially strong.

While these feelings are a natural reaction to loss of fertility, see the next two pages for ways to manage these feelings before they overwhelm you. It may also help to consider other ways of becoming a parent (see pages 61–63), or you may decide to stop trying to have a child.

For information about the impact on your relationship with a partner and your sexuality, see pages 69–71.

“ I am glad my doctor helped me work through the emotions of what was my top priority. I finally felt that overcoming cancer and getting on with my life were most important and everything else came after that. ” *Duncan*

Coping strategies

Learning that cancer treatment has affected your ability to have children can be challenging. There is no right or wrong way of coping. The strategies described here may help you feel a greater sense of control and confidence.



Find support from family and friends

Family and friends may not know how to communicate with you or they may make unhelpful comments such as, “Be positive” or “At least you’re alive”. You may need to remind people that you aren’t asking for advice or solutions, and that you simply want them to listen as you express your feelings.



Gather information

The impact of cancer on your fertility may change your future plans or make them unpredictable. Knowing your options for building a family may help you deal with feelings of uncertainty.



Explore peer support

Talking to people who have been in a similar situation to you may make you feel less isolated and provide you with practical strategies to help you cope. Consider joining a cancer- or fertility-related support group.



Consider counselling

A professional counsellor can help you discuss the impact of cancer and infertility on your relationships, ethical concerns, coping with fertility treatments, and your emotions about other people’s pregnancies, births and babies. Most fertility units have a fertility counsellor or you can find a private infertility counsellor near you at Access Australia (visit access.org.au).



Try relaxation and meditation exercises

Both of these strategies can help reduce stress and anxiety. Contact Cancer Council **13 11 20** for free copies of our meditation and relaxation CDs.

When you don't want to talk about it

There may be times when you do not want to talk about the impact of cancer treatment on your fertility. This may be because you think you don't have the words to describe how you feel, you are afraid of breaking down, or you find it too overwhelming or confronting.

You may find it easier to withdraw from family members and friends to give yourself time to make sense of what's going on. If you are a private person, this might be the best way for you to process your feelings. Exploring your thoughts by writing in a journal or expressing yourself creatively can be helpful if you find it difficult to talk to others.

You may want to avoid being a burden to others or fear appearing as if you are not coping. You may be specifically avoiding friends or family members who are pregnant or have children because it brings up painful emotions. It's okay to decline invitations to baby-focused events until you feel able to cope.

Over time and with support, you may come to terms with what you are going through and be able to open up to others. The pain of seeing your friends or family members with children will lessen.

“ I used to cry my eyes out every time I saw a friend with a new baby or I heard someone in my family was pregnant. Now I genuinely feel joy and happiness for them as I celebrate their news. ”  Grace



Monica's story

I was diagnosed at age 29 with oestrogen-receptive breast cancer. My partner and I had been dating for a year and a half. Our relationship was strong and I wanted kids in the next 1–2 years. My older sister was having problems conceiving, so I didn't want to wait and discover that I had the same problems.

From day one, the health professionals said we should be thinking about fertility if I wanted to have children in the future. It felt quite abrupt to just start thinking about it, but necessary.

When I mentioned to the medical oncologist that I was going to see a fertility specialist, her response was, "A lot of people are concerned about their fertility, but we need to save your life." I found her cold, but I didn't want to regret not exploring my options.

The fertility specialist harvested eggs through the IVF process. We were able to use a drug that didn't introduce more oestrogen

to my body. The timing of the egg harvest also worked well with my cycle, so it was only a two-week delay before I could start chemotherapy. This timing made the medical oncologist more positive.

They can't say how successful the IVF process is going to be – unfortunately, for me, they could only harvest one mature egg.

At this point, my partner and I had to decide: do we freeze my egg or a combination of the two of us in an embryo? We needed to consider what would happen if we didn't stay together for the long term. You know, it takes a lot of courage to acknowledge these difficult questions.

We decided to freeze an embryo, because the success rates of having a live birth from an embryo were slightly better than a frozen egg. We feel we will be together for a long time, so hopefully the embryo will give us the best chance possible when we want to have a baby.



Relationships and sexuality

A cancer diagnosis, treatment side effects and living with the uncertainty of infertility may affect your feelings towards your relationships and your sexuality.

Whether or not you have a partner, it may be a good idea to find out your fertility status as soon as you feel ready (see pages 57–60). This way, you can reflect on what you want and, if you have a partner, start talking with them about what the future may hold.

The effect on partners

Cancer, infertility and changes to your sexuality can put pressure on your relationship with a partner.

Your partner will also experience a range of emotions, which may include helplessness, frustration, fear, anger and sadness. How your relationship is affected may depend on how long you have been together, the strength of your relationship before cancer and infertility, and how well you communicate.

Everyone copes with infertility in their own way. Some partners are very supportive, while others avoid talking about it.

Fertility issues may become a source of unspoken tension between partners. If your partner is unwilling to talk about fertility, you might feel like you're coping alone or making all the decisions. It can also be challenging if you and your partner disagree about what to do and focus on different outcomes. Seeing a fertility counsellor can help you cope with and talk about these issues.

Sexuality and intimacy

Sexuality is about who you are, how you see yourself, how you express yourself sexually and your sexual feelings for others. Being able to conceive a child may be part of your sexual identity and infertility may change your attitude and feelings about sex. You may feel that sex is linked with the stress of infertility and you may lose interest in intimacy and sex (low libido).

Some cancer treatments may cause physical problems, such as pain during penetrative sex or trouble getting and keeping an erection. These problems may be difficult for you and your partner, if you have one.

Fertility issues cause some people to have a negative body image or feel that their body has “let them down”. It will take time to accept any physical and emotional changes. It may be helpful to:

- nurture your body with exercise, a healthy diet and sleep
- set aside some time to have a date with a partner
- think about what used to get you sexually aroused and explore if it still does
- experiment with things like masturbation, oral sex, sensual massage, lubrication and sex aids (e.g. vibrators or toys)
- focus on enjoyment and pleasure to take the pressure off conceiving
- clearly communicate your feelings or boundaries to a partner (e.g. “I just want to cuddle now” or “That feels good”).

If you feel you need further support, consider talking to a counsellor or sex therapist. To find a counsellor in your local area, speak to your doctor or call Cancer Council 13 11 20.

➤ See our *Sexuality, Intimacy and Cancer* booklet.

Starting a new relationship

Many people deal with a cancer diagnosis without the support of a partner. If you wish to start a new relationship, you may find explaining fertility issues to a potential or new partner difficult. You might worry that they won't be interested in you because you've had cancer, or because you may not be able to have children or have chosen not to.

While the timing will be different for each person, it can be helpful to wait until you and your new partner have developed a mutual level of trust and caring. Start the conversation when you feel ready. You may want to talk through the scenario with a friend, family member or health professional to practise what to say and think about answers to questions your partner may ask.

If you're a young adult

During and after cancer treatment, young people want to continue living life as normally as possible. This may include having a boyfriend or girlfriend. You may feel confused about how much to share about having cancer and the impact on your fertility.

CanTeen offers counselling to young people aged 12–25 who have been affected by cancer. This can be in person or by phone, email or instant messaging. It also runs online forums and camps. Call 1800 835 932 or visit canteen.org.au.



Support and information

Useful websites

You can find many useful resources online, but not all websites are reliable. These websites are good sources of support and information.

General

Australian

Cancer Council Australia	cancer.org.au
Cancer Council Online Community	cancercouncil.com.au/OC
Cancer Council podcasts	cancercouncil.com.au/podcasts
Australian Psychological Society	psychology.org.au
Beyond Blue	beyondblue.org.au
Cancer Australia	canceraustralia.gov.au
CanTeen	canteen.org.au
Carer Gateway	carergateway.gov.au
Carers Australia	carersaustralia.com.au
Department of Health	health.gov.au
Healthdirect Australia	healthdirect.gov.au
Services Australia (Centrelink and Medicare)	servicesaustralia.gov.au

International

American Cancer Society	cancer.org
Cancer.Net (US)	cancer.net
Cancer Research UK	cancerresearchuk.org
Macmillan Cancer Support (UK)	macmillan.org.uk
National Cancer Institute (US)	cancer.gov

Fertility related

Australian

Access Australia	access.org.au
Adopt Change	adoptchange.org.au
Australasian Menopause Society	menopause.org.au
Australian Donor Conception Network	australiandonorconceptionnetwork.org
Australian Foster Care Association	fostercare.org.au
Fertility Society of Australia	fertilitysociety.com.au
Future Fertility	futurefertility.com.au
Healthy Male Andrology Australia	healthymale.org.au
Intercountry Adoption Australia	intercountryadoption.gov.au
Royal Prince Alfred Hospital Fertility Unit	slhd.nsw.gov.au/rpa/fertility
Surrogacy Australia	surrogacyaustralia.org
The Royal Children's Hospital Melbourne	rch.org.au
The Royal Women's Hospital Melbourne	thewomens.org.au/health-information/fertility-information
Victorian Assisted Reproductive Treatment Authority	varta.org.au

International

Livestrong Fertility	livestrong.org/we-can-help/livestrong-fertility
SaveMyFertility	savemyfertility.org



Question checklist

Cancer treatment and fertility

Asking your doctor questions will help you make an informed choice. You may want to include some of the questions below in your own list.

- Will cancer or its treatment affect my fertility? Will this be temporary or permanent?
- Will any delay while I preserve my fertility affect the success of the cancer treatment?
- How long do I have to make a decision?
- Can you refer me to a fertility specialist?
- What fertility options do I have before treatment starts?
- What are the pros and cons of each fertility option?
- What are the chances of success of each fertility option?
- What are the risks and possible side effects of each treatment?
- Which fertility option should I avoid and why?
- What options do I have after treatment?
- How long after treatment should I wait before trying to conceive?
- Are there any out-of-pocket expenses not covered by Medicare or my private health cover? Can the cost be reduced if I can't afford it?
- Do I need to pay up-front before treatment begins?

Questions for reflection

Thinking about your answers to these questions may help your decision-making. There are no right or wrong answers.

- Has cancer changed my life goals, including having a child?
- If I decide not to have a child, what has led me to this decision? Are there benefits to not having a child?
- If I have a child, is it important that it is biologically related to me?
- What does my partner think?
- Which fertility option appeals to me and why?



Glossary

abdomen

The part of the body between the chest and hips, which contains the stomach, pancreas, liver, gall bladder, bowel, bladder, kidneys and some reproductive organs. Also known as the belly.

acute ovarian failure

Sudden loss of ovarian function.

adoption

When a child is placed into the permanent care of a person who isn't their biological parent.

anaesthetic

A drug that stops a person feeling pain during a medical procedure. A local anaesthetic numbs part of the body; a general anaesthetic causes a temporary loss of consciousness.

assisted reproductive technologies (ART)

Procedures that help infertile people have a baby.

biopsy

The removal of a sample of tissue from the body for examination under a microscope to help diagnose a disease.

bone marrow

The soft, spongy material inside bones. Bone marrow produces stem cells.

cervix

The lower part of the uterus that connects the uterus to the vagina. Also called the neck of the uterus.

chemotherapy

A cancer treatment that uses drugs to kill cancer cells or slow their growth. May be given alone or with other treatments.

clinical trial

A research study that tests new approaches to screening, prevention, diagnosis or treatment to see if they are better than current methods.

conceive

To create an embryo by fertilising an egg.

contraception

Deliberate measures to prevent pregnancy as a result of sexual intercourse (e.g. condoms, the pill).

cryopreservation

A process that freezes cells, tissue, semen or other substances.

donor egg

An egg that is given to another person and used to conceive a baby.

donor sperm

Sperm that is given to another person and used to conceive a baby.

dry orgasm

Sexual climax without the release of semen from the penis (ejaculation).

early menopause

See premature ovarian insufficiency (POI).

egg

See ovum.

egg harvesting

The collection of eggs through the vagina, using ultrasound guidance.

ejaculation

When semen passes through the urethra and out of the penis during orgasm.

embryo

The earliest stage of development after the egg is fertilised by sperm.

epididymis

A tightly coiled tube located at the back of each testicle. It stores immature sperm and connects the testicle to the spermatic cord, which contains the vas deferens.

erectile dysfunction (ED)

Inability to get and keep an erection firm enough for penetration. Also called impotence.

erection

An enlarged, rigid penis (sexual excitement).

fallopian tubes

Two thin tubes that form part of the female reproductive system. They carry sperm from the uterus to the ovaries, and eggs from the ovaries to the uterus.

fertility

The ability to conceive a child.

fertility preservation

Procedures used before cancer treatment to help people remain fertile.

fetus

An unborn human more than eight weeks after conception.

follicle

A cavity in the ovary that contains a maturing egg.

follicle-stimulating hormone (FSH)

A hormone produced by the pituitary gland. It regulates the function of both the ovaries and testicles.

fostering

When an adult takes responsibility for a child, but does not have parental status.

genetic testing

Genetic testing aims to detect

faulty genes that may increase the risk of developing certain cancers.

gonadotropin-releasing hormone (GnRH)

Long-acting hormone produced in the brain that tells the pituitary gland to release sex hormones, which in turn stimulate the ovaries and the testicles.

gonadotropin-releasing hormone (GnRH) analogue

Synthetically produced long-acting hormone that mimics the naturally produced GnRH, and which is used to slow or stop the function of the ovaries.

hormone replacement therapy (HRT)

See menopause hormone therapy (MHT).

hormones

Chemicals in the body that send information between cells. Hormones control growth and reproduction.

hormone therapy

A treatment that blocks the body's natural hormones, which sometimes help cancer cells grow.

hysterectomy

The surgical removal of the uterus and the cervix.

immunotherapy

Treatment that uses the body's own immune system to fight cancer.

infertility

The inability to conceive a child.

insemination

The deliberate injection of semen into a female body for the purpose of achieving conception/pregnancy.

intracytoplasmic sperm injection (ICSI)

An IVF procedure in which a single sperm is injected directly into an egg.

intrauterine insemination (IUI)

Depositing sperm directly into the uterus to increase the chances of conceiving.

Also called artificial insemination.

in-vitro fertilisation (IVF)

When an egg is fertilised with sperm in a laboratory and later implanted into a female body.

laparoscopy (keyhole surgery)

Surgery done through small cuts in the abdomen using a thin viewing instrument called a laparoscope.

luteinising hormone (LH)

A hormone produced by the pituitary gland. It tells an ovary to release an egg and the testicles to make testosterone.

lymph nodes

Small, bean-shaped structures found in groups throughout the body. They help protect the body against disease and infection. Also called lymph glands.

masturbation

Stimulation of the genitals without sexual intercourse to reach orgasm.

menopause

When a female stops having periods (menstruating). This can happen naturally, from treatment, or because the ovaries have been removed.

menopause hormone therapy (MHT)

Drug therapy that supplies the body with hormones that it is no longer able to produce naturally. Previously called hormone replacement therapy (HRT).

menstruation

A woman's monthly bleed from the vagina. Also called periods.

motility

The movement of sperm.

oestrogen

One of the two major sex hormones in females; produced mainly by the ovaries.

oophorectomy

The surgical removal of an ovary. If both ovaries are removed, it is called a bilateral oophorectomy.

oophoropexy

The surgical relocation of one or both ovaries to another area of the body to protect ovarian function. Also called ovarian transposition.

orchidectomy

An operation to remove one or both testicles.

orgasm

Sexual climax.

ovarian suppression

Methods to stop the functions of the ovaries.

ovarian tissue freezing

See cryopreservation.

ovary

A female reproductive organ that contains eggs (ova). It produces the hormones oestrogen and progesterone.

ovulation

The release of an egg (ovum) during the menstrual cycle.

ovum (plural: ova)

The female sex cell that is produced by the ovary and released during ovulation. Also called egg.

periods

See menstruation.

pituitary gland

A gland in the brain that produces hormones that control many of the body's functions, including growth, metabolism and production of sex hormones.

pre-implantation genetic diagnosis (PGD)

Testing embryos for specific genetic or sex-linked disorders before implantation into the woman's uterus.

premature ovarian insufficiency (POI)

The premature loss of ovarian function before the age of 40. This occurs when the ovaries no longer produce adequate amounts of sex hormones and can't develop a mature egg for ovulation. Also called early or premature menopause.

progesterone

One of the two major sex hormones in females. Progesterone is made mostly by the ovaries. It prepares the lining of the uterus (endometrium) for pregnancy.

prostate

A gland about the size of a walnut found only in males. It produces fluid that makes up part of semen.

prostatectomy

An operation to remove all or part of the prostate.

puberty

The process of reaching sexual maturity and becoming capable of reproduction.

radiation shielding

Protecting a part of the body from external beam radiation therapy using a shield.

radiation therapy

The use of targeted radiation to kill or damage cancer cells so they cannot grow, multiply or spread. Also called radiotherapy.

retrograde ejaculation

A condition where the semen travels backwards into the bladder instead of forwards out of the penis.

scrotum

The external pouch of skin behind the penis that contains the testicles.

semen

The fluid ejaculated from the penis during sexual climax. It contains sperm from the testicles and fluids from the prostate and seminal vesicles.

seminal vesicles

Two small glands that lie near the prostate and produce fluids that form part of semen.

sperm

The male sex cell. It is made in the testicles and is required for reproduction.

sperm banking

See cryopreservation.

stem cells

Unspecialised cells found in the bone marrow from which mature cells develop.

stem cell transplant

A treatment in which diseased blood cells are destroyed by high-dose chemotherapy or radiation therapy, then replaced by healthy stem cells.

surrogacy

When a woman (a surrogate) carries a child and gives birth on behalf of someone else.

tamoxifen

An anti-oestrogen drug used to treat breast cancer.

targeted therapy

Drugs that attack specific particles (molecules) within cells that allow cancer to grow and spread.

testes

See testicles.

testicles

Two oval-shaped glands that produce sperm and the hormone testosterone. They are found in the scrotum. Also called testes.

testicular sperm extraction (TESE)

Surgically removing sperm from testicular tissue.

testosterone

The main sex hormone in males. Testosterone is made by the testicles and promotes the development of male sex characteristics.

trachelectomy

The surgical removal of the cervix and some surrounding tissue.

trans or transgender

A term for a person whose gender identity does not match their birth sex.

transvaginal ultrasound

A test that uses soundwaves to create pictures of the uterus, ovaries and other female reproductive organs.

ultrasound

A scan that uses soundwaves to create a picture of part of the body.

uterus

A hollow muscular organ in a female's lower abdomen in which a fertilised egg (ovum) grows and a fetus is nourished until birth. Also called the womb.

vagina

A muscular canal about 7–10 cm long that extends from the entrance of the uterus to the vulva.

vas deferens

A pair of tubes that carry the sperm from the testicles to the prostate.

Can't find a word here?

For more cancer-related words, visit:

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

References

1. Practice Committee of the American Society for Reproductive Medicine, "Fertility preservation in patients undergoing gonadotoxic therapy or gonadectomy: a committee opinion", *Fertility and Sterility*, vol. 112, no. 6, 2019, pp. 1022–33.
2. Clinical Oncology Society of Australia, AYA cancer fertility preservation guidance working group, *Fertility preservation for AYAs diagnosed with cancer: Guidance for health professionals*, Cancer Council Australia, Sydney. Available from: https://wiki.cancer.org.au/australia/COSA:AYA_cancer_fertility_preservation. (Accessed 9 December 2019.)
3. Australian Government, *National Women's Health Policy 2010*, Department of Health and Ageing, Canberra, 2010.



How you can help

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

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

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

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

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

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

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



Cancer Council 13 11 20

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

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

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

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

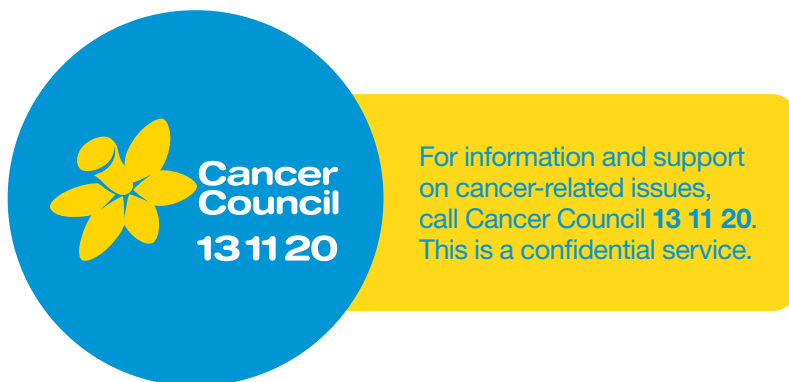
Cancer Council services and programs vary in each area.

13 11 20 is charged at a local call rate throughout Australia (except from mobiles).



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

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



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