

Preserving Your Fertility:

OVARIAN TISSUE FREEZING

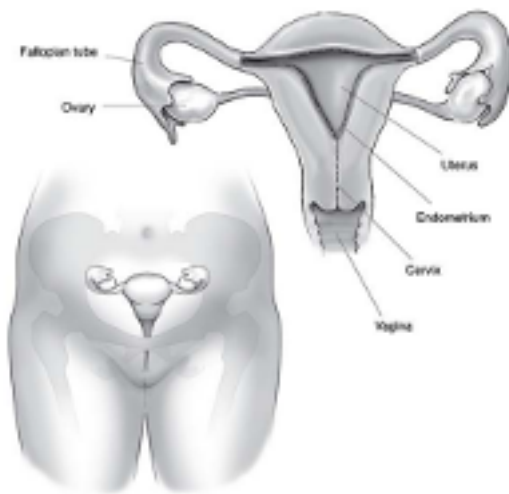


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Cancer treatment can affect fertility. Treatments such as chemotherapy, radiation, bone marrow and stem cell transplant, and some surgery can damage the ovaries and reduce egg numbers women have available for future pregnancy.

About the female reproductive system

The ovaries are two small organs, located on each side of the uterus, within the pelvis. They contain cells called the oocyte or 'eggs'.



The eggs grow to maturity within the ovary, in fluid filled sacs, known as "follicles", and are released each month into the fallopian tube ready for fertilisation by sperm.

Girls are born with a certain number of eggs, which decrease throughout their reproductive life. However, cancer treatment may reduce egg numbers more rapidly.

Sometimes due to cancer treatment the ovaries are not able to produce mature eggs at all – this is known as ovarian failure. This change may last for a short time after treatment has stopped or it can be permanent.

How can fertility be preserved?

There are a number of ways to preserve fertility, such as:

- egg or embryo freezing
- ovarian tissue freezing
- surgery to protect ovaries from radiotherapy
- medication (medical therapy) to protect the ovaries from toxic chemotherapy drugs.

For more information see the booklet *Preserving your fertility for the future: Options for young women have treatment for serious medical conditions*.

Why choose ovarian tissue freezing?

- You are about to have treatment such as chemotherapy, radiotherapy or surgery, which may affect your fertility.
- You have a non-cancerous medical condition that may threaten your fertility.
- Your fertility specialist has offered you the option of ovarian tissue freezing.
- You have limited time available before medical therapy can start and this technique has been recommended.
- You have a high risk of premature menopause after cancer treatment.
- You have not started to have periods yet (you have not reached puberty).

What is unique about ovarian tissue freezing?

- Freezing ovarian tissue has the potential to preserve large numbers of immature eggs.
- Ovarian tissue can be grafted (transplanted) back into the body.
- If grafting is successful, the immature eggs that were frozen in the tissue will start to develop. These eggs can then be collected in an IVF (in vitro fertilization) procedure.
- Unlike egg and embryo freezing where it is necessary to stimulate a menstrual cycle and so can take a few weeks to complete, ovarian tissue freezing can be performed at very short notice.
- It can be performed even if cancer treatment is to start immediately after diagnosis.
- This is the only method of fertility preservation possible for young girls who have not reached puberty.

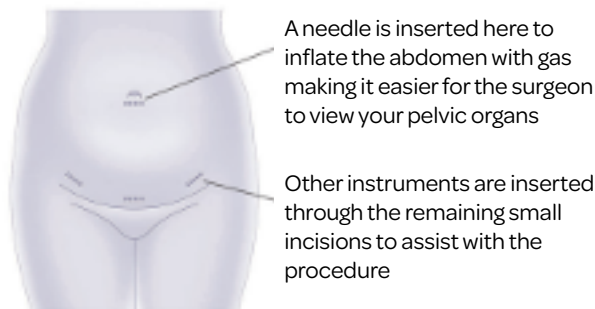
How does it work?

Step One: Collection of ovarian tissue

- Ovarian tissue containing immature eggs is removed through keyhole surgery known as laparoscopy.
- A laparoscopy is performed under general anaesthetic so you will stay in hospital for at least a few hours.

About laparoscopy

A laparoscopy involves several small incisions to the abdomen through which instruments for the surgery are inserted including a laparoscope. A laparoscope is like a tiny telescope used to view the pelvic organs.



- A piece of ovarian tissue (or in some cases the entire ovary) is removed. It is then cut into tiny slices and frozen*.
- Full recovery after the laparoscopy may take a few days to a week. However, cancer treatment may be started even as early as the next day.
- As with any surgery, there are risks to undergoing a laparoscopy. These risks include:
 - infection
 - bleeding
 - organ damage (approximately 0.1 percent)
 - blood clots
 - complications from the anaesthetic.
- Cancer and its treatment can be complex. Close communication and co-ordination between you, the doctor/s treating your cancer, and fertility specialist is essential.

* If you would like to know more about this procedure watch this short animation produced by Cincinnati Children's Hospital – <https://youtu.be/uHSwss2Bh94>

Step two: Ovarian tissue grafting

The frozen ovarian tissue can be thawed and grafted back into your body if:

- you would like to be pregnant
- your own egg supply has been depleted
- you have completed cancer treatment and are considered cured or disease-free.
- The tissue is grafted back in to the pelvis, on to the remaining ovary or surrounding peritoneum (filmy covering of the pelvis).
- Grafting is done using laparoscopic surgery.
- In most patients, the grafted ovarian tissue starts to develop follicles and produce reproductive hormones after 4-6 months.
- Once the follicles are active, pregnancy may be achieved with ovarian stimulation
- Spontaneous pregnancy is also possible but less likely.

Step three: Ovarian stimulation

- This usually involves cycles of hormonal injections and egg collection procedures, similar to IVF cycles.
- Unlike regular IVF, only a very small number of eggs are collected each time.
- When a mature egg is collected, it is fertilised with sperm and the embryo is transferred into the uterus.
- Sometimes the egg or embryo is frozen for later use by you or a surrogate if you are unable to carry a pregnancy to term.
- Multiple cycles are usually required to achieve pregnancy. Ovarian stimulation is a more difficult and involved process than regular IVF.

How successful is it?

- Reproductive hormone production occurs in over 90 percent of women.
- Pregnancy will depend on other factors, such as the number of eggs in the implanted tissue and how many stimulation cycles are attempted.
- The overall success rate is unknown.
- There are many births reported worldwide and it is now recognised as a realistic and non-experimental option.

What are the risks?

One of the main concerns of transplanting thawed ovarian tissue is the potential to reintroduce malignant cells which allow your cancer to redevelop. Bloodborne cancers have a higher risk of this and therefore grafting is not recommended.

To reduce this risk a small sample of the ovarian tissue is thawed and tested for cancer cells, both at the time of tissue collection and again before grafting.

It is important to understand that the possibility of cancer cells within the rest of the tissue cannot be ruled out. Therefore, grafting ovarian tissue may not be a safe option for some women.

There are risks associated with laparoscopy surgery, both at the time of harvesting the ovarian tissue and grafting (see above).

Future possibilities

Reproductive medicine in rapidly evolving and other methods utilising the tissue to achieve pregnancy are being studied.

One of the possibilities is to mature the primordial follicles (very immature eggs) in the frozen ovarian tissue, outside of the body.

If successful, in vitro maturation (IVM) would eliminate the need to surgically transplant the ovarian tissue back into the body.

Key points

- Ovarian tissue freezing is one of the options for preserving fertility in women for whom cancer treatment poses a high risk of ovarian failure
- The collection of ovarian tissue is via surgical procedure called laparoscopy
- The tissue is frozen in strips for later use
- Ovarian tissue can be grafted back into the body (also via laparoscopy) and when it starts to produce reproductive hormones gentle stimulation is commenced to collect the eggs.

For more information

Fertility Preservation Clinic Royal Women's Hospital
www.thewomens.org.au/patients-visitors/clinics-and-services/fertility-genetics/fertility-preservation

Melbourne IVF

<https://www.mivf.com.au/treatments-services/fertility-preservation>

The Royal Women's Hospital

www.thewomens.org.au/health-information/fertilityinformation

Fertility Society Australia

www.fertilitysociety.com.au

The Oncofertility Consortium

oncofertility.northwestern.edu

Future Fertility

www.futurefertility.com.au

CanTeen

www.canteen.org.au/?s=fertility

Cancer Council Australia

www.cancer.org.au

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