

The ability to freeze embryos, eggs and sperm has become invaluable in fertility treatment and preservation. This fact sheet explains what is involved in this process and some of the situations where it may be used.

THE FACTS ABOUT:

## Freezing and storage

### What is freezing?

'Freezing' is the popular name for 'cryopreservation' in the IVF laboratory. The process means we can preserve eggs, sperm, embryos and even tissue fragments (of ovary and testis) for future use. We infuse the samples to be frozen with a cryoprotectant to protect them from ice-crystal formation and cool them to very low temperatures. All frozen eggs, embryos and sperm are stored in liquid nitrogen tanks at  $-196^{\circ}\text{C}$  (Fig. 1).

Figure 1: Tanks in the laboratory that contain frozen embryos and sperm stored at  $-196^{\circ}\text{C}$



The ability to cryopreserve embryos in particular has been invaluable to couples undergoing fertility treatment. Since the first human pregnancy from a frozen embryo was reported in 1984, the process has become a routine part of fertility treatment. The freezing process itself has improved over this time and we now use a method called 'vitrification' which is particularly effective for freezing embryos at the blastocyst stage.

### Does it cost anything to freeze and store?

Freezing and storage of embryos for one year is included in the cost of a fresh IVF cycle. It is the same for eggs. Storage of sperm for a year is included in the cost of sperm freezing.

Beyond that first year we do charge an annual fee to cover the costs of keeping your samples safely in storage. You will get a bill at the end of the first year for the coming year (or part thereof).

### How long can samples be stored for?

Before we freeze embryos, eggs or sperm we will ask you to consent to freezing and storage. This consent will allow us to keep your embryos (or eggs / sperm) in storage for up to 5 years.

If you would like us to keep them in storage beyond that time, you will need to keep in touch with us and complete further consent to storage for another 5 years. In some circumstances we can extend storage again beyond that, but this will require a review of your situation by your fertility specialist at the time.

In all cases though, we need to have the consent of the owners of the embryos, eggs or sperm to keep them in storage. If we do not have your consent, and if no alternative arrangements have been made, we will need to remove them from storage and arrange for their disposal.

## Why do we freeze embryos?

In a typical IVF or ICSI cycle, stimulating the ovaries to produce many eggs often produces more embryos than we can safely transfer to the woman's uterus at one time.

Transferring high numbers of embryos creates a significant risk of multiple pregnancies so we select only the best one (or occasionally two) embryos to transfer and can freeze any additional good quality embryos. These can then be thawed and transferred at a later date if the first cycle is not successful or if you want to create a brother or sister for your baby.

It is now quite common for the fertility doctor to recommend that we 'freeze all' suitable embryos in a cycle. This might be because the lining of the uterus is unsuitable for transfer or it is hoped that the environment in the uterus in a later cycle might give a better chance of implantation.

All suitable embryos can also be frozen and used later if a woman is at risk of developing ovarian hyperstimulation syndrome (OHSS). 'Freeze all' is recommended in these circumstances because a pregnancy can make OHSS much more severe.

## When are embryos frozen?

Human embryos can be frozen on day one after insemination or at any stage up to and including the blastocyst stage (five or six days after insemination). At Life Fertility Clinic, we usually freeze embryos at the blastocyst stage.

## What does a frozen embryo transfer cycle involve?

The IVF cycle for frozen-thawed embryos is slightly different from the standard IVF cycle because the woman does not need to go through egg collection. You can read more in the separate *Frozen embryo transfer* fact sheet.

## What are the success rates using frozen embryos?

As with all IVF, the pregnancy success rates for frozen-thawed embryo transfer cycles vary according to the woman's age and other factors. The implantation rate for thawed frozen embryos at the blastocyst stage is approximately the same as for fresh blastocysts.

## Are there any risks with embryo freezing?

The main risk of freezing is cell damage during the freezing-thawing process that results in embryos not surviving.

Embryo survival rates are usually highest (more than 90%) for blastocysts that have been frozen by vitrification. Embryos frozen at an earlier stage are usually frozen by a slightly different technique called 'slow freezing' and approximately 80% of these embryos survive the thawing process.

Embryo survival varies between patients irrespective of the technique used or the stage at which they were frozen. Occasionally none of a couple's embryos survives the freezing and thawing process.

There is no evidence to suggest that freezing and thawing embryos results in any increased risk of miscarriage or congenital abnormality.

## Who is responsible for the embryos in storage?

The person or couple who embarked on treatment together and signed the original freeze consent are responsible for all decisions about the embryos in storage. It doesn't matter whether they used donated eggs or sperm they are still the 'owners' of the embryos.

In the case of a couple, both of their signatures are required for any action related to the embryos in storage: for example use in treatment, disposal or donation (below).

## What are the options if I/we have finished our treatment?

If you no longer want to use embryos that you still have in storage for your own treatment, there are a couple options that you might want to consider.

- You can instruct Life Fertility Clinic to dispose of your embryos on your behalf by completing a consent form.
- You may be able to donate the embryos to another person/couple.

This will usually require completion of paperwork, some blood tests, counselling and consents. There is a separate fact sheet about embryo donation.

- Donation of embryos to research.

This is legal in Australia but is dependent on clinics that have a license for research needing embryos for a particular project at a particular point in time. We can advise you at the time if this is an option for you.

## What happens if we separate or one of us dies?

Your consent to freeze and store embryos will ask you to consider what you want to happen to your embryos if you are a couple and you separate or one of you dies.

Broadly speaking you can ask us to dispose of your embryos or keep them in storage until you have a legal agreement in place indicating who is responsible for them.

If you are undergoing treatment as a single person and you pass away, Life Fertility Clinic will dispose of your embryos on your behalf.

## Freezing sperm

Sperm cells have been frozen and thawed successfully for more than 40 years. Depending on the quality of the initial sample, ejaculated sperm can be frozen for future use either in artificial insemination or IVF procedures.

The option to freeze semen is often offered to men about to undergo cancer treatment in case they cannot produce viable sperm afterwards.

For couples undergoing fertility treatment, semen samples may be frozen before fertility treatment if the man is not available or isn't able to produce a sample on the day of treatment.

Surgically retrieved sperm and testicular tissue (PESA/TESA) can also be frozen.

Donated sperm is always frozen to maximise its use and to allow us to quarantine the samples before use. Donors are screened for infectious diseases when they donate and again six months later. The frozen samples are not released for use until the second results are available.

## How do I organise a semen freeze?

When we freeze semen we assess the sample first by reviewing your semen analysis.

*There is a separate fact sheet about semen analysis.*

Preparation for semen freezing is therefore very similar to what needs to be done prior to a semen analysis so we will ask you to:

- Provide us with the results of HIV, Hep B and Hep C tests that have been done in the last 2 years (more recently if you are donating sperm). We can organise a pathology request for this if you need one.
- Abstain from sexual activity where possible for 2-7 days.
- Make an appointment to produce a sample at the clinic for sperm freezing. Samples can be produced off site in some circumstances but we will need to give you a special pot and some paperwork beforehand and you will still need to make an appointment to drop it off.
- Complete a consent to freeze and store sperm and get your signature witnessed by us or notarised elsewhere.

## What about freezing eggs?

A lot of scientific research has been carried out to develop techniques to cryopreserve mature eggs. The first baby born using frozen eggs was in 1986 but in the years that followed only a small number of babies were born worldwide from thousands of frozen-thawed eggs and the IVF community considered the technology to be experimental only.

In recent years, the technique of vitrification for freezing eggs has been refined and results have been improving. Life Fertility Clinic can now offer egg freezing by vitrification in certain cases.

The ability to freeze eggs before fertilisation is an option for patients undergoing IVF who have religious or ethical objections to freezing embryos or disposing of them later.

Freezing eggs also has the potential to help women facing premature loss of ovarian function or those who are due to undergo cancer treatment.

## Can ovaries be frozen?

Ovarian tissue can be frozen, although the techniques are still being developed and are considered experimental for fertility preservation. Approximately 30 babies have been born worldwide after freezing ovarian tissue.

In future, the option to freeze ovarian tissue could be offered to patients needing cancer treatment. It would offer a straightforward way of preserving many eggs without needing ovarian stimulation and could also be an alternative to help preserve fertility for women at risk of premature ovarian failure.

## Contact Life Fertility Clinic

The friendly and professional team at Life Fertility Clinic are happy to answer any other questions you may have about the freezing process.