

EMBRYO FREEZING (EMBRYO CRYOPRESERVATION)

What is embryo freezing/cryopreservation?

Embryos can be frozen in extremely cold temperatures using chemicals called cryoprotectants. Under such conditions, the embryo can remain dormant until such time as needed for an assisted reproduction procedure. Once frozen, embryos are stored in liquid nitrogen (-196°C) tanks in the laboratory. Through a thawing process, the embryos are revived and the biological processes that take place in the embryos are resumed.

Why do I need embryo freezing/cryopreservation?

Embryos that are products of an In-Vitro Fertilisation (IVF) and/or Intra-Cytoplasmic Sperm Injection (ICSI) cycle are frozen to allow the couple to use the embryos from one IVF/ICSI cycle for future transfer to the uterus without the need to repeat another ovarian stimulation cycle.

Following is some of the instances where embryo freezing would be used are:

- In fresh IVF/ICSI cycles where there is an excess of embryos. Freezing embryos allow a couple opportunities to get pregnant in future without going through another fresh IVF/ICSI cycle.
- In a patient whose ovaries are overstimulated during an IVF cycle, a subsequent immediate embryo transfer may not be safe. By freezing the embryos, this allows the embryos to be transferred into the patient's uterus at a later time when it is safe to do so.
- In couples where either spouse is about to undergo cancer treatment, embryos may be frozen for future use.

Embryo freezing will be conducted at the Hospital (the SingHealth institution where the Procedure is performed). Only embryos which have a good chance of surviving the freezing and thawing processes will be chosen to be frozen at the Hospital. You are signing this consent form under the assumption that embryos will be available for freezing. You will be required to pay an annual storage fee.

What are the possible risks and complications of embryo freezing/cryopreservation?

Miscarriage and ectopic pregnancy

In the event of a pregnancy following the freezing, thawing and implantation of the embryos, there is a risk of miscarriage and ectopic pregnancy (pregnancy occurring outside the normal cavity of the uterus).

Damage to embryo(s)

Embryo freezing and storage processes may result in damage to the embryos, which may not be immediately detected or determined. Potential damage to embryos include:

1. Damage to the genetic material (material found in the cell which plays a role in determining the structure and nature of cell).
2. Loss of some embryonic cells, which has been associated with reduced chance of pregnancy after transfer into the uterus.
3. Loss of embryo viability.
4. Cryo-injury (damage from the freezing and thawing process).

Some of the risks involved during the process of collecting, freezing, storing and/or thawing may be technical or procedural in nature in terms of being attributable to:

1. Mechanical support systems and equipment
2. Human factors

Such technical/procedural risks can lead to embryo damage or complete embryo loss. As a result of the damage to the embryo, there is a possibility they may no longer be utilised. While the Hospital will take reasonable precautions to safeguard the frozen embryo(s) during the period that the embryo(s) are in its custody, unforeseen situations may occur. The Hospital will act in accordance with all applicable laws and Ministry of Health (MOH) guidelines in freezing, storing, thawing, and implantation of the embryo(s) including the use and disposal of the embryo(s).

Storage and disposal of embryos

Embryos can be:

1. Frozen and stored beyond 10 years from the date of fertilization. Before the end of 10 years, if you and your spouse wish to extend the storage for another 10 years, you and your spouse will be required to come down personally to the Hospital to give consent for extension of storage beyond 10 years. Failing which, your embryos will be disposed. There is a lack of scientific evidence about the impact of long-term storage of frozen embryos on survival and pregnancy rates as well as to the health of the children born from these embryos. However, there are a few case reports of children born from embryos stored beyond 10 years and these do not show any adverse outcomes.
2. Donated to another couple. You will need to undergo further HIV (Human Immunodeficiency Virus) and CMV (Cytomegalovirus) screenings at the time of IVF and fulfil any other conditions required by MOH. The wife must be between the ages of 21 and 35 at the time of IVF. Please note that you will be required to sign a separate consent form at the point of donation.

Stored embryos will be disposed of in the event that any one of the situation occurs:

1. Should the couple divorce
2. In the event of premature death or demise of one partner
3. One or both of the couple become incapable of varying or revoking consent
4. If payment of the annual storage fees are not made by the payment due date. An invoice will be sent to you prior to the payment due date.
5. If you and your spouse fail to give consent for extension of storage beyond 10 years.

Declaration

1. We acknowledge that we have had a full discussion and confirm that we understand the nature, purpose, risks, complications and alternatives with regard to **Embryo Freezing (Embryo Cryopreservation)** ("Procedure").
 2. We acknowledge that the complication(s) listed are not intended to be exhaustive. We have had an opportunity to ask for more information about (i) the above-mentioned complications; (ii) the risks in general; and (iii) specific concern(s) of relevance to us.
 3. We acknowledge that this consent does not assure that all our embryo(s) will be selected for cryopreservation.
 4. We understand that embryos can be frozen and stored beyond 10 years from the date of fertilization. Before the end of 10 years, if we wish to extend the storage for another 10 years, we understand that it is our responsibility to come down personally to the Hospital to give consent for extension of storage beyond 10 years. Failing which, the Hospital reserves the right to lawfully dispose the embryos.
 5. We understand that there is a lack of scientific evidence about the impact of long-term storage of frozen embryos on survival and pregnancy rates as well as to the health of the children born from these embryos. However, there are a few case reports of children born from embryos stored beyond 10 years and these do not show any adverse outcomes.
 6. Having read this consent form, we hereby authorise and instruct the Hospital (the SingHealth institution where the Procedure is performed) to dispose of our embryo(s) in the event that any one of the conditions listed below is/are met:
 - 6.1 In the event that we are divorced;
 - 6.2 In the event of premature death of one of us;
 - 6.3 In the event one or both of us become mentally incapacitated or unable to change or revoke our consent (based on doctor's certification);
 - 6.4 If we fail to make payment for the annual storage fees by the payment due date;
 - 6.5 If we fail to give consent for extension of storage beyond 10 years.
 7. (Only applicable for patients between 21 and 35 years of age at the start of the IVF treatment cycle) We understand that we have the option of donating our embryo(s) to another couple in the event that our embryo(s) may no longer be needed. We also understand that we have to undergo further HIV and CMV screenings at the time of IVF and that the donation is subject to MOH's guidelines on embryo donation. The embryo(s) will be disposed if there is no suitable recipient within 10 years.
 8. We understand that if we wish to change our instructions in this consent form, we need to give fresh written instructions to the Hospital.
 9. We undertake to inform the Hospital if there are any changes to our residential addresses and contact numbers after the date of this consent form. We understand that it is our responsibility to update the Hospital of any change in our contact details. If our failure to update our contact details results in the Hospital being unable to contact us, the Hospital shall be entitled to dispose of our embryo(s) and we shall not hold the Hospital liable for any resulting loss or damage incurred.
 10. We release the Hospital and its personnel from claims for loss, damage or destruction of embryos stored with the Hospital as far as the law permits.
 11. We thus hereby consent to the Procedure.
 12. We understand and agree that the Procedure will be performed by the appropriate SingHealth institution and the Patient will be admitted and/or registered as a patient of that SingHealth institution.
- (Please note that statements 6.1, 6.2, 6.3 are in accordance with the Ministry of Health Licensing Terms and Conditions on Assisted Reproduction Services, 2020)*