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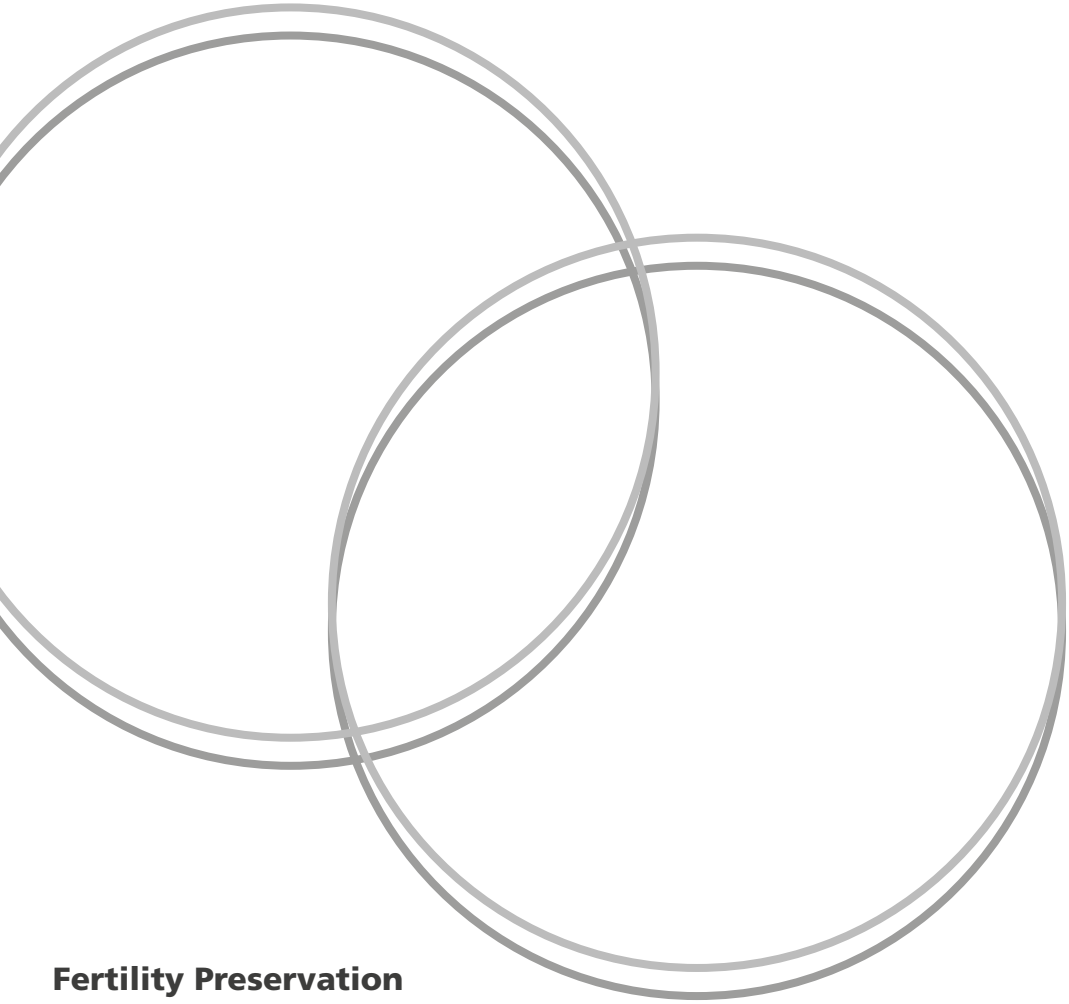
Testicular Tissue Cryopreservation

Information for parents/carers



Fertility Preservation

Testicular Tissue Cryopreservation

This leaflet has been produced by the Oxford University Hospitals NHS Foundation Trust (OUH) offered through the Future Fertility Programme Oxford (FFPO) which is known to provide information about one type of fertility preservation treatment, testicular tissue cryopreservation. This type of fertility treatment is available to patients who, due to the proposed treatment or diagnosis are at high risk of infertility and who cannot store sperm due to age or the urgency to continue treatment.

The Future Fertility Programme Oxford offers advice and treatment to children and young adults at risk of infertility. We accept referrals from across England, Wales and Northern Ireland and can also, in some cases, offer advice and treatment to patients from other countries who are having treatment for their underlying problem in England.

Frequently Asked Questions about Testicular Tissue Cryopreservation

What is testicular tissue?

The testes (or testicles) are part of the male reproductive system. A male usually has two testicles that sit in the scrotal sac. The testes contain two types of cells important for sperm production, one which produces a hormone called testosterone and the other which contain sperm stem cells. Once a male reaches puberty, these two cells work together to produce sperm. These cells and the supporting blood and lymph vessels that we that we refer to in this leaflet as 'testicular tissue'. This testicular tissue can be preserved by a specialised freezing technique called cryopreservation.

What is cryopreservation?

Cryopreservation is the method used to safely preserve various types of human tissue, including testicular tissue. It involves slow controlled freezing of thin strips of tissue before transfer to storage in freezers at very low temperatures (approximately -170°C) using liquid nitrogen vapour. At these ultra-low temperatures, testicular tissue can be safely stored for many years; preserving the important cells for sperm production.

Is Testicular Tissue Cryopreservation successful?

Testicular tissue cryopreservation is still a relatively new treatment for fertility preservation for males. It is therefore termed 'emerging' or 'experimental' treatment. It has been available for children for about 10 years and whilst we know that tissue can be successfully stored, none of the males with tissue stored are old enough yet to wish to start a family. Whilst, to date, there are no human babies born from frozen tissue there have been successful pregnancies and live births in research studies in animals. The scientific field is progressing very rapidly and effective, successful ways of using human stored testicular tissue is not far away.

How is testicular tissue collected and stored?

To obtain the testicular tissue for cryopreservation, a wedge-shaped section (biopsy) is taken from one of the testicles. This is usually a short procedure under general anaesthetic and is often planned alongside other procedures needed for delivery of treatment such as insertion of a central venous line. Whenever possible, the surgery will be performed in your child's treating hospital and the testicular tissue will then be carefully packed and transported to the OUH tissue bank which is called the Oxford Cell and tissue biobank (OCTB) where it will be processed and stored.

At the Oxford OCTB tissue bank, the testicular tissue will be prepared for freezing. Human tissue contains about 90% water and, to ensure that ice crystals do not form during freezing and destroy the cells, the tissue needs to be cut into very specific sized pieces carefully preserved by specialist tissue bank staff.

The process includes removing water from the cells and adding preservative (called a cryoprotectant) which will replace the water. Once the water has been removed, the tissue pieces are placed in cryovials (small tubes) containing the cryopotecant and transferred into a computer controlled machine which slowly cools them down to ultra-low temperature (-150°C). They are then transferred to a storage freezer at approximately -170°C where they can be safely preserved for many years.

Will this procedure damage the testis?

Removing a wedge biopsy for testicular tissue cryopreservation will not cause damage to the testicle itself, although one testis will be a little smaller than the other. However, it is the gonadotoxic treatment (chemotherapy, radiotherapy etc.) that could damage the cells that produce sperm as well as those that produce testosterone.

What happens if you decide to go ahead?

1. Your child's treating doctor will complete a referral form, containing their personal details, their planned treatment schedule, pathology reports and clinic letters, and send it to OUH lead clinician for the FFPO for review of eligibility for testicular tissue cryopreservation. The FFPO lead clinician may request further information or discuss the proposed treatment with you if there are any issues that need resolution before proceeding to plan treatment.
2. A blood test will be required to provide information on their current hormone levels.
3. If the referral is accepted, the team at your child's local referral centre will liaise with the FFPO team to arrange an appropriate surgery date and place for the surgery to obtain tissue. If at all possible, the surgery will be combined with another required procedure such as insertion of a central venous line for chemotherapy.
4. A member of the FFPO team will contact you to ensure you have received this information leaflet and have access to the website and video about the procedure. They will also ensure that you have a copy of the consent form which will need to be completed at a consultation meeting with a member of the FFPO team prior to surgery.
5. During the telephone consultation meeting, a member of the FFPO team will be able to answer all your questions and guide you through the consent form. You will need to sign the Cryopreservation consent form prior to the surgery.
6. Prior to surgery, the surgical team will explain the surgical side of the procedure as well as what to expect in the days after surgery. You will also have an opportunity to ask any questions related to the surgery prior to signing the surgical consent form.
7. During surgery, a blood sample will also be required to test for some infectious diseases that can be found in tissue. Small samples of tissue will also be used for quality assurance testing. This testing is a regulatory requirement for all patients who are storing tissue for future use.

8. Once the tissue has been transported to the Oxford tissue bank (OCTB) and cryopreserved, you will receive a summary letter from the FFPO, with details of the unique OCTB tissue bank storage number, contact details and a copy of your signed consent form for your records.

9. It is important that you make the OCTB aware of any change of address or circumstances. The OCTB will ensure that the data is held on a secure database and that the designated tissue bank is aware of any changes

What will happen if your child wants to use their tissue in the future?

If, following the medical treatment, your child's has experienced loss of fertility (i.e., destruction of the sperm stem cells) and they wish to start a family, we can explore the best way for their tissue to be used to try to restore fertility.

The initial step would be for your child to contact their original Principal Treatment Centre or the FFPO or OCTB directly. They would be offered a Consultation in the Children and Young Adult Fertility Clinic to discuss the treatment options available to them.

Is there a risk that the stored testicular tissue could contain cancer cells?

When the testicular tissue is collected, a small sample will be examined by the histopathology team. They will look carefully at the tissue under the microscope to report on the quality of the tissue being stored and also the presence of any cancer cells.

For patients with blood cancers (e.g., leukaemia), there is a higher risk of cancer cells being found in the tissue as these cells circulate in the blood through the tissue. As the level of disease can be very low in the tissue, normal microscopes may not be sufficient to detect cancer cells. It is very likely that the use of more advanced and sensitive technologies will be required in the future to detect these cancer cells.

Any risks will be discussed in full at the time your child potentially wishes to use the stored tissue.

What will happen when your child no longer requires their tissue?

The tissue we store will be for your child's use only and cannot be used or donated to another person. Should your child no longer wish to store the tissue, or in the event they pass away, we will need to know what your wishes are for this tissue. The tissue can either be discarded or, with your permission, donated for anonymous use in ethically approved research to help discover more about infertility in children and young adults and how stored tissue can be more effectively used to restore fertility. Your wishes will be discussed with you in full at the FFPO consent consultation prior to tissue collection.

If you have further questions or would like more details, please contact us

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Further information

If you would like an interpreter, please speak to the department where you are being seen.

Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

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