

The Royal Children's Hospital Fertility Preservation Service

Information Sheet

Ovarian Tissue Harvest for Possible Fertility Preservation

Background

Medical treatments or conditions in childhood (such as chemotherapy, radiotherapy, hormone conditions) may reduce the number of eggs in the ovaries. Depending on severity, this can sometimes affect hormone production, puberty, periods or fertility. Your health providers will outline the estimated impact of your child's treatment on fertility. Unfortunately it can be difficult to be precise about this due to limited data. The banking of mature eggs (egg collection) prior to commencing cancer treatment is still the best guarantee of preserving long-term fertility for females, but this is only possible after puberty, and can cause delays to cancer treatment so is not always possible.

When there is little time before cancer treatment, or in prepubertal girls, we can offer storage of tissue from the ovary which contains immature follicles (ovarian tissue freezing). This is experimental, and is only undertaken at The RCH under special approvals.

The procedure and logistics

Ovarian tissue freezing requires collection of healthy ovarian tissue, via a key-hole operation (a laparoscopy) prior to starting treatments that may harm the ovary and preserved for a future time when fertility may be required. It is hoped this may be done via two experimental options:

1. returning the tissue to the body at a later date (transplantation)
2. maturing the cells outside the body and using mature eggs derived from that technique.

It is important to understand that there is no guarantee that the banking of ovarian tissue will lead to successful pregnancies and live births.

The surgery is performed by the Gynaecology team or the Surgery team at the Royal Children's Hospital. The procedure is performed by laparoscopy ('key hole' surgery), which involves a small incision in the belly button through which a camera is introduced. One to three other small incisions are made in the abdomen and about one third of the covering of the ovary (the cortex, where the eggs are stored) is removed. Sometimes the whole ovary is removed if it is very small, or if the treatments are likely to cause a severe impact on future ovarian function. The procedure takes about 30 minutes but is usually coordinated with other operations so the total time asleep may be longer. By the next day your child should be walking and eating. Recovery time is usually a few days.

The tissue is collected by IVF scientists and stored at IVF laboratories. Currently scientists from the Reproductive Services Department at the Royal Women's Hospital (RWH) are able to collect the tissue at surgery and process it at their centre. You do not have to have tissue stored at this centre if you don't want to, in which case we will

do everything possible to arrange storage at another IVF centre of your choice and inform you of any costs involved. If your child's tissue is stored at RWH, it does not mean that they have to have future fertility care at that centre (Melbourne IVF, RWH). Currently there is no storage charge for the tissue until your child turns 21 at RWH. However, a storage charge may be introduced by Melbourne IVF at any point. Doctors at the Royal Children's Hospital are not involved with the storage after the tissue is collected, and all future dealings regarding the stored tissue would be between yourself and the IVF centre.

Outcomes so far

Only around 131 pregnancies have been reported worldwide using ovarian harvest technology so it is considered experimental. Two live births have been reported in women who have had their tissue stored in childhood. The ovaries of young people, especially children contain immature eggs. It is difficult to mature the eggs after they are thawed. Furthermore there are high rates of loss of eggs during the freezing and thawing process. The procedure is offered in the hope that by the time your child has achieved adulthood and wishes to have a baby, the procedures may be more successful. There have been isolated case reports in children of the replanted tissue being hormonally active again. If your child has a diagnosis of cancer, there is a risk that the tissue might contain cancer cells which could be reintroduced back into the body when the tissue is implanted.

Who is eligible

Theoretically there is no lower age limit for ovarian tissue harvest. We may advise against the procedure in certain situations such as certain cancers where there may be a risk of reintroducing the cancer back into the body in the future. For example, in leukemia if tissue is collected it is deemed too dangerous to put back into the body at this stage. Technology may advance to allow the tissue to be matured outside the body so that mature eggs can be collected from that tissue for IVF, however the technology is in very early stages.

We need to also determine that your child is well enough for surgery. Multiple abdominal scars, bleeding disorders or serious immune deficiency may preclude your child from having the procedure done. We also take into account the differing views within a family about such procedures. Sometimes we consult with the Clinical Ethics Committee to assist the decision making in the event that the decision is not so clear cut. This is undertaken urgently so as not to delay treatment.

Risks and Benefits

The surgery (Laparoscopy and ovarian tissue harvest or removal of one ovary) is not experimental as this procedure is performed routinely by gynaecologists and surgeons for other indications. However, the use of immature ovarian tissue to attempt pregnancy in the future is considered experimental.

Fertility Preservation is offered where there is a hope of cure, irrespective of the chance of survival.

Expected risks of the surgical procedure:

1. Risk of a general anaesthetic. There may be situations where your child's medical situation may present specific increases in the risk of anaesthesia, for example age less than one year. In these situations yourself, the anaesthetist and the other treating teams will need to discuss the risk versus benefit issues. The safety of your child in the short term is the very important factor. Mostly the risk relating to the anaesthesia for the extra fertility procedure for your child will be so small it would be difficult to estimate. The anaesthetist can clarify if your child has any special aspects of their condition that could influence the risk of surgery.
2. Risk of laparoscopy in general are: infection (around 7%), bleeding, damage to internal structures (bladder, bowel, blood vessels, 1-3/1000) which may occasionally require performing an open operation. These risks are likely to be higher during cancer therapy.
3. Risk of changing from keyhole surgery to a larger incision (laparotomy) 0.5-2%
4. Death 4/100 000

5. In the event of young age: The ovaries will usually be very small, it is highly possible that one entire ovary may need to be removed. We are not sure if the removed ovarian tissue or the remaining ovarian tissue will be functional in the future.
6. Delay to treatment: the procedure will usually be timed with other operative procedures necessary for treatment of the disease. As far as possible the surgery is performed within a few days of diagnosis, and if so should not impact prognosis. We will try and find the earliest date to undertake the procedure, however we will defer to your treating doctor (e.g. oncologist) if he or she deems that it is too unsafe to wait for this date. In this event the fertility procedure will need to be cancelled, as safety is our priority.

Other options

1. Monitoring of ovarian function when your child is older occurs regardless of whether they have fertility preservation now or not, with a view to having egg freezing. However, if there is a high chance of ovarian failure we may not have the opportunity to undertake this.
2. Oocyte retrieval now if age appropriate and time permitting.
3. Egg donation from mother, sibling or other donor in the future.
4. Adoption.
5. Use of a hormone which suppresses ovarian function (Zoladex) and may protect the ovary, however studies on this are very conflicting in terms of success. This is only offered to girls who have already gone through puberty.
6. None of the above.

Other issues to consider

1. Cost of procedure: this is currently free but it may change.
2. Storage of tissue: occurs for 20 years after which time you have to renew the request. This is an arrangement between you and the IVF centre and does not involve the Royal Children's Hospital.
3. Costs of future IVF treatment and tissue storage costs.
4. The tissue can only be used by your child and in the unfortunate event of death the tissue must be disposed of. In this instance a member of the team will contact you to discuss arrangements.
5. The tissue cannot be donated to research or be utilized by anyone other than your child.