

In Vitro Fertilisation (IVF)

In Vitro Fertilisation (IVF) is the process where eggs (oocytes) are taken from the woman's body, fertilised in a laboratory with sperm and incubated after which time one or two of the resulting embryos are transferred into the woman's uterus.

The basic stages involved in the IVF procedure are detailed below.

- Suppression of the natural cycle
- Growth and maturation of several eggs
- Monitoring egg development
- Trigger injection
- Collection of the eggs
- Fertilisation of the eggs in vitro
- Transfer of the embryo into the uterus
- Progesterone treatment and pregnancy test
- Further treatment cycles

Suppression of the natural cycle

Medications used to suppress the cycle can either be started one week before the period is due (Long Down Regulation Cycle), the day after onset of the period (Flare Cycle) or when serial ultrasound indicates appropriate timing for commencement (Antagonist Cycle). These medications are Lucrein and Synarel, which belong to a group known as Gonadotrophin Agonists, or Orgalutran and Cetrotide, which belong to a group known as Gonadotrophin Antagonists. Use of these medications allows control of the cycle and accurate timing of oocyte collection which dramatically improves the success of oocyte collection.

Growth and maturation of eggs

In the IVF cycle, medication, given by injection is used to stimulate the ovaries to develop a number of eggs compared with a natural cycle where usually only one egg is produced.

The drugs used to stimulate egg production may be Puregon or Gonal F. Sometimes other medications are also added e.g. Clomiphene Citrate (Clomid) or Pregnyl.

Multiple factors impact upon the exact prescription that will be given to an individual. Your specific treatment plan will be decided between you and your gynaecologist.



Monitoring egg development

The eggs (Oocytes) develop in follicles, which are small fluid filled sacks growing in the surface layer of the ovary. As the eggs mature the follicles increase in size and produce increasing amounts of oestradiol (an oestrogen hormone).

By monitoring oestradiol levels with serial blood tests (usually starting day 8 of the cycle) and follicle size and number by ultrasound, the maturity of the developing eggs can be tracked. Once the eggs are considered mature the HCG trigger injection (see below) will be arranged.

Blood tests

Blood tests have to be done between 7.30am and 9.00am so that the results are available the same day. This can be done at the main Concept Fertility Centre.

Ultrasound examination

These scans are done at Concept Fertility Centre between 0800am and 0900am. Ultrasounds are usually performed vaginally and no full bladder is needed. It is important to note that the number of eggs collected during the egg collection procedure may differ from the number of follicles seen on ultrasound.

Trigger injection

HCG (human chorionic gonadotrophin) is a hormone which performs the function of the naturally occurring LH (Lutenising Hormone) surge, triggering the final maturation of the eggs and ovulation. This is referred to as the trigger injection. This is given by subcutaneous injection 34- 36 hours before the egg collection is planned.

It is extremely important that this injection is given at the exact time planned as failure to do so will result in no eggs being collected.

If you make a mistake with the timing of your trigger injection it is important to inform the nurse coordinator. A trigger injection is always required in IVF cycles.

There is no "correct" oestradiol level to reach before trigger injection as there is enormous variation between individuals. The pattern of blood and ultrasound results interpreted together determine whether the response to treatment is good. In general, however, it is important that the oestradiol level rises steadily until the eggs are collected. It is very important to realise that a wide range of individual treatments are used in the program. Please do not be alarmed if your treatment is different from someone else's. The aim is to design the best individual protocol for you.

Collection of eggs (Ovum Pick-up)

This is most commonly done using a fine needle attached to a vaginal ultrasound probe (under a light anaesthetic). In certain circumstances the egg collection may need to be done laparoscopically, in which case a general anaesthetic is used. The follicles are visualised by ultrasound, and the fluid inside them (containing the egg) is sucked through a needle into a test tube. The tube is passed immediately to the embryologist who looks for the egg under the microscope. The eggs are then put in the incubator. You can usually be discharged 2-4 hours after the operation. When possible, your own gynaecologist will perform the egg collection, but because of other commitments this is not always possible.

Sperm collection

Sperm collection is usually done just before the egg collection procedure.

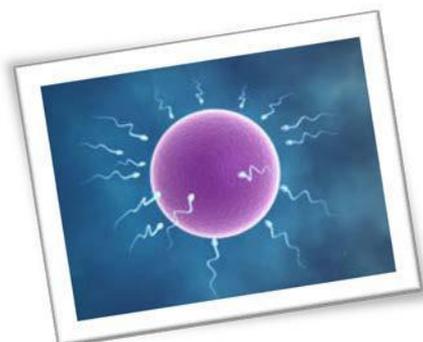
It can be very difficult for some men to produce a sperm sample on request under these conditions. If you are worried about this aspect of the program, please discuss it with us at or before the start of the treatment cycle, so that arrangements can be made to freeze some semen if necessary - semen freezing must be done at least a week before egg collection.

Sexual activity may be continued as usual until three days before the time of the egg collection. Abstaining from then on is important to allow the sperm to reach optimum quality.

Events in the laboratory

The sperm sample is washed and then put with the eggs, four hours after egg collection. This is the procedure known as In-Vitro Fertilisation or IVF. In some situations a single sperm may be injected directly into the egg, this is called Intra-Cytoplasmic Sperm Injection or ICSI. Some patients may have their eggs matured for some hours before being inseminated.

After the sperm has been placed with the eggs they are kept in culture dishes in an incubator until next inspected 16-18 hours later. At this time they are checked under the microscope to determine whether fertilisation has occurred.



Embryo Transfer

You will need to contact the Coordinator daily so we can inform you of the progress of your embryos. Transfer of the embryo in to the uterus will be between Day 2 after fertilisation up until Day 5 at which stage the embryo is called a Blastocyst. No more than 1 or 2 embryos will be transferred because of the risk of multiple pregnancies.

Embryo transfer is a minor procedure, usually requiring no anaesthetic. The embryo transfer is usually undertaken by your gynaecologist unless they are committed elsewhere. It is a little like having a pap smear performed, a speculum is passed into the vagina, the cervix is washed with fluid that is non-toxic to embryos and then an outer catheter is placed into the cervical canal. Once your doctor is happy with the positioning, the embryologist will bring through your embryo loaded in a second catheter. This catheter is then passed through the outer catheter. Once the doctor is happy with the positioning of this catheter, the embryo is gently expelled into the uterus. The procedure takes approximately 15 minutes. After transfer you will be asked to rest for 1/2 hour.

Surplus Embryos

The usual circumstance is that all oocytes collected will be fertilised then excess embryos will be frozen for transfer in future cycles. Some couples may wish to have variations on this practise due to ethical or religious beliefs, for example, fertilisation of only 2 oocytes and freezing of excess unfertilised oocytes. They can remain in storage for a maximum of 10 years with extensions of time if approval is granted by the Reproductive Technology Council in exceptional circumstances before the expiry date. You will be sent a reminder by Concept at 12 months and three months before the expiry date.

Progesterone and pregnancy blood test

The hormone progesterone is needed to help the embryo attach to the wall of the uterus and development of the placenta. During an IVF cycle progesterone is administered via progesterone pessaries, Crinone Gel or less often by Pregnyl injections. This progesterone supplementation will be started on the day of egg collection.

You will be given instructions after your embryo transfer regarding your blood test(s) and medications. Other blood tests, specific to your cycle which are ordered by your doctor will also be on your post-operative instruction sheet. Menstruation does not necessarily mean that a pregnancy is not developing. You must continue blood tests until a final outcome is known.

The blood test taken approximately two weeks after your egg collection will detect whether the pregnancy hormone (HCG) is present and check your blood progesterone level. If the pregnancy hormone is detected it is too early to know whether there is a healthy continuing pregnancy. Further blood tests and an ultrasound examination are needed.

Unfortunately IVF, like natural conception, can lead to a chemical pregnancy (transient rise in pregnancy hormone followed by a late period), miscarriage or ectopic (tubal) pregnancy, as well as the happier outcomes: so a positive blood test is not the end of the waiting.

Multiple pregnancy (twins or triplets) are more common with IVF than with natural conception if 2 embryos are replaced. A single pregnancy is safest for both the mother and the baby. The number of embryos to be replaced should be discussed at each treatment with your doctor.

Repeat In-Vitro Fertilisation attempts

If pregnancy is not achieved then a repeat attempt can be made after a full menstrual cycle has elapsed. This break is important to ensure a good response and reduce the risk of side effects in future treatment cycles. The next treatment cycle may involve blood tests and hormone tracking for frozen embryo transfer or a further IVF cycle depending on individual situations.

The probability of pregnancy with IVF increases with each treatment cycle. Research has shown it may take up to five IVF cycles to achieve a pregnancy.

Please make review appointments with your gynaecologist well in advance to avoid delays in progression of your treatment.

For more information on what to expect in a treatment cycle please see the patient information sheet entitled "Risks and Side Effects of ART medication and procedures".



TREATMENT OVERVIEW

Stimulation of the ovaries

In this stage medication is taken to help the ovary to develop a number of eggs.

Collection and insemination of the eggs

This procedure is usually done under light anaesthetic. The eggs and fluid are gently removed from the surrounding follicles and placed with washed and treated sperm from the male partner.

Embryo development

The fertilized eggs are placed into embryo culture dishes and then into specially designed embryo incubators. The embryo development is checked daily until the time of the embryo transfer.

Embryo transfer

This is a minor procedure lasting about fifteen minutes. Embryos can be transferred to the uterus 2, 3, or five days after fertilization.

Embryo storage

Embryos that are not transferred can be cryopreserved and stored for use in subsequent frozen embryo transfer cycles.

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