

# IVF and ICSI

## (in vitro fertilisation and intracytoplasmic sperm injection or microinjection)

Fact Sheet

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### Before starting

When you are ready to start treatment you should see your fertility specialist. The preparation phase is most important. You should expect a detailed history, full physical examination and investigations should be performed before your treatment cycle. These often take at least two or three consultations and incur some out of pocket expenses. These should be discussed with you.

You should ask what alternative treatments are available and compare the success rate quoted to that which you might have without treatment or with alternative treatments. Screening tests will need to be performed on both partners and include the following:

#### Women

- Rubella and varicella (chicken pox) immunity
- Hepatitis B & C and syphilis serology
- Pap smear (within 2 years)
- HIV testing

#### Men

- Hepatitis B & C and syphilis serology
- Semen test within 12 months
- HIV testing

Ensuring optimal preparation for a healthy pregnancy include checking thyroid function, levels of vitamin D and sometimes other tests. Women should take folic acid (higher dose if they are overweight or obese) and iodine supplements. If a woman is underweight or overweight, achieving a weight in the healthy weight range is associated with an improvement in success rate. Cigarette smoking should be ceased by both partners prior to a treatment cycles. Illicit drugs and excessive alcohol should also be ceased. Any associated medical conditions like high blood pressure, predisposition to diabetes and clotting disorders should be evaluated prior to commencing a treatment cycle. Many clinics arrange the measurement of a blood test on the

female called "AMH" – anti Mullerian hormone which can help to predict the number of eggs obtained during a treatment cycle and assist in determining the correct dose of drugs to use. There is an out of pocket cost for this test.

**In Australia, some costs for IVF and ICSI are covered by Medicare, the Extended Medicare Safety Net and private insurance.**

Treatment will be likely to involve some out of pocket expenses for the couple. There are a number of adjunctive or additional treatments which can be used in certain situations to improve success rates.

**It is reasonable to expect that all costs are made known to you before you proceed with a treatment cycle. It is often not possible to estimate these prior to the assessment of your individual circumstances.**

# IVF and ICSI

For Medicare benefits to be paid you need a current referral to your gynaecologist. Unless your doctor has written an indefinite referral, a new one will be needed every twelve months, so it is essential that you check this with your gynaecologist's secretary.

Couples with infertility problems have faced many frustrations, disappointments, tests and other operations before contemplating IVF.

Fertility treatment can be physically and emotionally taxing and the uncertainty while waiting for results can be very stressful.

Everyone has difficulty coping with the stress from time to time.

Counselling sessions are included as part of the treatment cycle and you should discuss this with your treating doctor and/or the nursing staff.

Nursing staff associated with fertility clinics undertake special education in fertility treatments and often have a high level of experience helping patients with their stresses. It is important to utilise the help of nursing and counselling staff.

Consent forms must be signed before starting treatment. It is important to read information sheets and consent forms carefully so that you can discuss any issues of concern with your doctor or the fertility clinic staff. Some useful websites are available through the AccessAustralia website.

## Drug treatment

In normal ovulation only one egg is produced each month. In IVF and ICSI drugs are used to stimulate the ovaries to produce several oocytes (eggs) because this increases the chance of pregnancy... There are many variations of drug treatment and your specific drugs and dosages will be advised by your doctor. Treatment usually involves a daily injection of follicle stimulating hormone (FSH) which may be synthetically made or extracted from human urine and most commonly now additional injections of a drug commonly called "antagonist" (gonadotrophin releasing hormone (GnRh) antagonist). GnRH antagonist prevents the early release of eggs.

You should expect to be told what drugs are going to be used and should be given information about the side effects of the drugs.

Most drugs are covered by the Health Insurance Commission but some incur additional cost and you should be informed of these costs.

Most women will have daily injections starting during their period and continuing for 6-10 days until an ultrasound examination is done. The nursing and/or medical staff will instruct you in the injection technique.

It is common to have some discomfort and nuisance side effects while taking the drugs. The main serious side effect is over-response, which is severe in about 1 in 1,000 stimulated cycles. This process called the "hyper-stimulation syndrome" causes massive fluid shifts in the body which in turn produce abdominal pain or an increase in your girth or weight following egg collection. Nausea and vomiting may also occur. With appropriate treatment this problem resolves satisfactorily.

## Ultrasound examination and blood tests

Avaginal ultrasound examination is done about a week after the commencement of the drug treatment to measure the response of your ovaries.

This shows the number and size of the follicles growing in the ovaries, which is a guide to how many eggs to expect and when they will be mature. (A follicle is the fluid filled swelling in the ovary which contains the egg.) This information is used to decide whether you need further drug treatment and also to plan the day of egg collection. Blood tests may also be required to measure oestrogen levels and to help decide the timing of the egg collection.

Sometimes blood tests are not performed during a treatment cycle.

If only one or two follicles are visible, and only a few eggs seem likely, the chances of pregnancy may be low cycle and cancellation may be suggested.

## Including ovulation before the egg collection ("Trigger")

Sometimes GnRH agonist (Synrel or Lucrin) is used to induce ovulation just prior to the egg collection but most commonly a drug called hCG (human chorionic gonadotrophin) is used to induce ovulation. It may not be needed if a surge has occurred in natural cycle IVF. The injection of hCG is given 34-38 hours before the egg collection is performed.

# IVF and ICSI

The day for egg collection will usually be decided when you have your ultrasound scan and will depend on the size and number of follicles and a number of other factors such as previous treatment cycles.

## Egg collection

Once you have been told the date and time of your egg collection you should have nothing to eat or drink from midnight the night before the procedure. The eggs are collected through the vagina under ultrasound control, using a fine needle which is passed through the vagina into the ovary. Fluid from the follicles is sucked through the needle into a test tube and is passed immediately to the laboratory nearby where the scientists check for eggs under the microscope. The eggs are then placed in culture fluid in special dishes in the incubator at body temperature.

The egg collection is performed under general anaesthesia or local anaesthesia with some sedation.

**Some clinics allow partners to be present during the egg collection if their partners are available and most couples find it very interesting.**

There is always an anaesthetist present who will control the pain associated with the procedure. You can request a full anaesthetic at any stage. If a general anaesthetic is needed it is not appropriate for the partner to be present as the staff are fully occupied.

**The procedure takes 15–30 minutes and an average of 8–10 eggs will be collected. Rarely there will be no eggs found.**

Generally the woman is discharged from hospital a few hours after an oocyte collection as the embryo transfer (ET) is two to five days later. (An embryo is a fertilised egg which has divided at

least once to reach the two cell stage or beyond). It is common to have some vaginal bleeding after egg collection from where the needle passes through the vaginal wall. This usually settles in one to two days and does not affect the chance of pregnancy. Some discomfort from the swelling of the ovaries is common and paracetamol can be safely used. Some clinics advise against the use of non steroidal anti-inflammatory drugs. Although the surgery is very minor, it is not without risk and the risks of the procedure including injection and injury to other structures should be explained prior to the treatment cycle.

## Semen collection

The semen sample is needed on the day of egg collection. Sometimes frozen samples of sperm can be used to fertilise the eggs.

The semen sample is best produced by masturbation and there is a room set aside for this purpose. Lubricants should not be used as they can affect fertilisation. It is difficult for some men to produce a sperm sample on request and any concerns should be discussed with the doctor well in advance so a treatment plan and /or freezing of semen can be arranged.

**Many clinics allow the semen sample to be collected at home.**

There are two main methods of fertilisation of eggs.

**The first is standard IVF when approximately one to two hundred thousand sperm are placed with the eggs in a culture dish and left overnight.**

**The second is ICSI or microinjection where for each egg the**

**embryologist selects a single sperm and injects it into the egg using a fine glass pipette.**

ICSI has some risks and additional costs and all these should be discussed with you prior to your treatment cycle. ICSI is indicated where the sperm numbers are very low or following failed fertilisation. ICSI is also required if pre-implantation genetic diagnosis is being performed or if frozen eggs are being used.

## After egg collection

The day after egg collection the eggs are examined for fertilisation by the scientists.

**In 1–2% of cases fertilisation fails to occur.**

Most clinics contact the couple by telephone to tell them how many eggs have fertilised. In general 70% of eggs fertilise normally.

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# IVF and ICSI

## Embryo transfer (ET)

ET is often performed two (or sometimes three) days after egg collection. Many clinics perform extended culture and transfer the embryo later – often five days after egg collection when the embryo has formed a blastocyst. A blastocyst is a more advanced stage of development and is associated with a higher chance of pregnancy. Embryo transfer is a simple procedure needing no sedation. The woman's feet are placed on supports and a speculum is inserted to visualise the cervix. The embryos are passed through the cervix into the uterus using a very fine soft plastic tube. It takes only a few minutes and is usually about as uncomfortable as having a pap smear. There is no need to rest afterwards; you may go straight home or back to work and all normal activity, including sexual intercourse, is permitted.

Usually one or sometimes two, embryos will be transferred and this will be discussed with you.

**If you are pregnant after having two embryos transferred, the chance of twins is about 25%.**

Abnormal or degenerate embryos will not be transferred. If there are surplus embryos after the transfer, it may be possible to store them (called cryopreservation) for later transfer, which increases the chance of chances of pregnancy from the one IVF/ICSI cycle.

## Luteal support

To ensure the lining of the uterus is optimal for attachment and implantation of the embryo the woman is required to use progesterone vaginally or take injections of hCG.

## Pregnancy test

Women who have eggs or embryos transferred in IVF or ICSI are given a date for a pregnancy test. It is important that the test is performed even if menstrual bleeding occurs, as there is a small chance of pregnancy even with vaginal bleeding. The overall chance of taking home a baby from a single IVF or ICSI cycle (excluding frozen embryo transfers) is influenced by the age of the woman at the time she has the egg collection. The chance of having a live birth is about 30% per IVF/ICSI treatment cycle started if a woman is aged thirty or less. The chance of a live birth falls with age of the female and is about 2% after the age of 40. Miscarriage and ectopic pregnancies can occur, as with any conception.

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