



Information Sheet on Assisted Fertilisation by Microinjection (ICSI)

Prior to the introduction of microinjection about 8% of the couples passing through the Queensland Fertility Group's in vitro fertilisation and embryo transfer (IVF-ET) programme had complete failure of the oocytes to fertilise. In a vast majority of cases this would have been a known possibility, usually as a result of previously identified defects in the male partner's sperm. In addition, then, as now, a small number of couples have total fertilisation failure for no apparent reason - their eggs and sperm are apparently normal or near-normal leaving no obvious reason for the failure.

In conventional in vitro fertilisation we simply place the best sperm that we can isolate from the semen in a small amount of culture medium with the oocytes. It is then up to the sperm to penetrate the eggs and fertilise them. For couples in whom fertilisation failure has occurred, and for those where the male partner's semen quality makes it a likely possibility, the Queensland Fertility Group has the microinjection procedure of ICSI to help them over this problem.

In 2010 we are now finding that around 60% of couples having IVF treatment also require the ICSI sperm injection procedure for a variety of reasons to maximise the number of eggs fertilised.

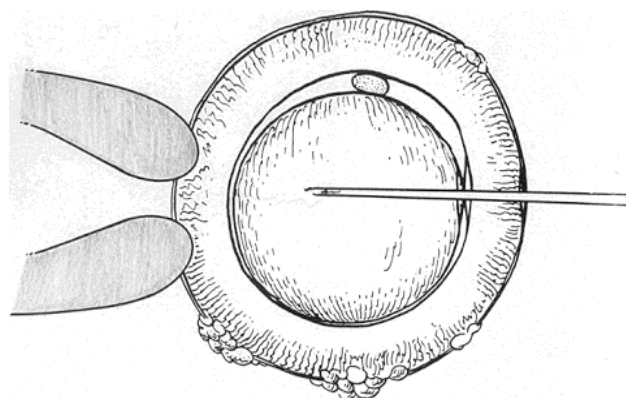
The ICSI Procedure

Following the use of a number of different approaches to assisted fertilisation, the technically more sophisticated technique of **Intra-Cytoplasmic Sperm Injection (ICSI)** was introduced in 1994 and has proved to be the superior technique, yielding a high percentage of fertilised eggs and most importantly giving a higher pregnancy rate. ICSI involves the injection of a single sperm into the cytoplasm of the egg. No motility is required for the sperm used for ICSI and therefore it is the method of choice for very poor quality sperm and sperm retrieved from the testis and epididymis. For some forms of preimplantation genetic diagnosis it is necessary to use ICSI for the fertilisation process.

The Procedure of Microinjection

Couples having microinjection will notice little difference from routine IVF-ET. All the ovulation induction injections will be the same but the egg pick-up will be performed early in the day and a semen sample will be required about an hour later. Microinjection is a very time consuming procedure and there will be NO flexibility in the time that the semen sample is required.

The following diagram shows the ICSI microinjection process. The oocyte in the centre is held by a holding pipette on the left while the sperm is injected into the egg through the very fine microinjection pipette from the right. They are controlled by joysticks and the whole procedure is observed down a microscope.



Following microinjection the oocytes resume the routine IVF process with a fertilisation check on the following day and embryo transfer the following day.

Embryo transfer is performed as for IVF-ET with transfer to the uterine cavity.

Since the procedure requires preparation of equipment and culture media the day before, the decision to have ICSI must be made prior to egg pick-up.

Semen Samples

Semen samples are required around the time of the oocyte pick-up, most likely before your partner has recovered from her anaesthetic. The exact time will be individualised according to the known quality of, and problems with, the semen.

If you envisage any problem with producing a semen sample unassisted, you should discuss this **BEFOREHAND** with your doctor or the scientists.

Safety of Microinjection

The initial concern about microinjection was that assisted fertilisation with sperm that were unable to fertilise eggs unassisted in vitro may result in an increased fetal abnormality rate. Sufficient babies have now been born from ICSI procedures world-wide to have largely laid this concern to rest. Although some small studies continue to produce figures requiring continued surveillance, world statistics on ICSI have found no indication of severe chromosomal aberrations or major congenital malformations after the birth of many thousands of babies. Furthermore children arising from ICSI have been shown to reach normal developmental milestones up to five years of age. There is always the possibility that male infertility may have some genetic basis and therefore be passed on to any male children resulting from use of the procedure. If you have any concerns about this you should discuss them with your doctor before commencing treatment.

Success Rates

With **ICSI** around 95% of couples have at least one oocyte fertilised and receive an embryo transfer after the procedure. QFG Results from 2009 reveal that ICSI cycles having up to two embryos transferred have yielded a pregnancy rate of around 46% in those aged up to 35 years and 11% in those aged 40 and over. Many factors such as your age, the number of embryos transferred, any other causes of infertility, and whether you smoke will influence these rates and you should discuss with your doctor your individual chances.

The ICSI procedure is yielding the same overall fertilisation rate as obtained by couples having conventional IVF with normal semen ie. around 65%.

Costs of Having Microinjection

There is now a Medicare item number to cover assisted fertilisation by microinjection. Please contact any QFG Office for the current cost of this procedure.