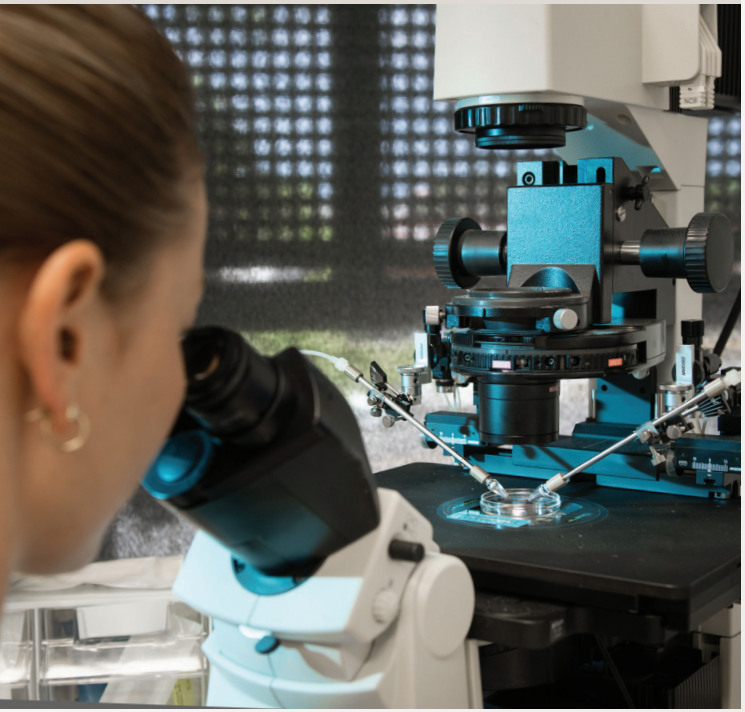
In-Cycle

Intracytoplasmic Sperm Injection (ICSI)

What You Need to Know



City Fertility Centre
your partners in life

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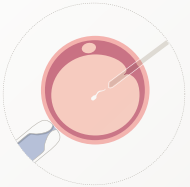

Intracytoplasmic Sperm Injection (ICSI) is a specialised form of IVF that is used for the treatment of severe cases of male-factor infertility. ICSI involves the injection of a single sperm directly into a mature egg.

At City Fertility Centre we use a medium called Sperm Slow® during sperm selection. This medium contains hyaluronan (HA), which binds sperm that are more likely to have normal DNA, and thus allows selection of these bound sperm for injection. By selecting the sperm that are bound to HA and using them for ICSI, the embryologists are preferentially using the better-quality, more mature sperm. This technique is also known as PICSI and we use it as standard practice with no additional cost to the patient.

When is ICSI used?

About 30% of all infertility is due to a significant male-factor problem. ICSI has revolutionised the treatment of male infertility. Before the first successful ICSI pregnancy in 1992, little could be offered to couples with severe male-factor infertility, aside from using donor sperm.

Who is ICSI - IVF recommended for?

ICSI – IVF is recommended for couples who have had poor or no fertilisation during standard IVF, as well as men who have:

- Poor sperm morphology (abnormally shaped sperm).
- Poor sperm motility (slow moving).
- A low sperm count.
- An obstruction such as a vasectomy, which prevents sperm release.
- Antisperm antibodies (which are produced by the man's body and may inhibit sperm function).
- A vasectomy reversal that was unsuccessful or resulted in a low sperm count or poor-quality sperm.

Please note: Patients using testicular sperm (where most sperm are not progressively motile) and patients with less than 1 million motile sperm in the final sample preparation may be unable to use Sperm Slow®.

ICSI with Sperm Slow® (PICSI) – IVF treatment procedure

Before ICSI can be carried out, mature eggs must be retrieved from the female partner during a standard IVF cycle. The male partner's semen sample is prepared in the lab to isolate as many healthy, moving sperm as possible. After allowing the eggs to rest for two to three hours following their removal, the tight outer coating of cells (cumulus) is removed from each egg. Only then can we be sure the egg is mature enough to undergo ICSI.

Immature eggs cannot be injected. However, they can be incubated for a further two to six hours and reassessed. If they mature in that time, they can still be injected along with the other mature eggs.

A special instrument is used to hold the egg in place. It is so small you can barely see the tip with the naked eye. A thinner, sharp, needle-like instrument is used to pick up a single sperm.

Motile sperm are selected for injection on the basis of their morphology (shape). The selection of sperm using this visual approach may not necessarily reflect the functionality of the sperm or its ability to fertilise an egg (oocyte). Sperm Slow® provides a functional test based on the ability of sperm to bind to HA – hydrogel mimicking the natural binding of mature sperm to oocytes in the female.

With great precision, the needle is inserted through the egg's outer coating (the zona pellucida) and into the egg itself. The sperm is slowly injected into the egg and the needle is removed, leaving the sperm behind.

The injected eggs are placed in an incubator overnight and checked the next morning for signs of fertilisation. After an additional 24 hours, we can determine how many have divided and gone on to form embryos. Not all eggs fertilise, and not all fertilised eggs become embryos. As with standard IVF, the number of embryos replaced into the uterus depends on the woman's age and medical history. Provided they appear healthy, additional embryos can be frozen if desired.

What are the benefits of using Sperm Slow® (PICSI)?

Sperm in vivo (in nature) encounters HA in the cervical mucus and in the cumulus matrix surrounding the oocyte. Penetration of the cervical mucus and cumulus matrix by the sperm in vivo is a critical element in successful fertilisation and subsequent embryo implantation (when the fertilised egg attaches to the lining of the uterus). HA is vital in this interaction. Sperm Slow® takes advantage of this naturally occurring encounter and allows the embryologist to select a HA-bound sperm for injection. By selecting the sperm that are bound and using them for ICSI, the embryologists are preferentially using the better-quality, more mature sperm.
Publications have shown that sperm bound to HA are more likely to have less DNA damage and a normal chromosome complement. While there is usually no visible difference in the number of oocytes that fertilise, there is generally better day-three to day-five embryo development. Additionally, more blastocysts are available for vitrification, and significantly higher ongoing pregnancy rates have been shown for patients using ICSI with Sperm Slow® compared with standard ICSI.

The potential fertility improvement that this type of treatment may yield depends on the woman's age, diagnosis and the initial semen analysis, and should be discussed with your specialist.

What are the potential risks?

For the egg:

As ICSI is more invasive and requires more handling than standard IVF insemination techniques, there is a small chance (less than 2%) that the egg may be damaged during the procedure – resulting in a non-viable egg.

For the resulting child:

Thousands of children around the world have been born as a result of ICSI. So far, there is no convincing evidence that the incidence of birth defects is any different with ICSI or IVF compared with children born to other parents of similar age and health.

The mother's age at delivery, family history and the presence of pregnancy complications are the most important predictors of newborn health. However, it is possible that a male child born as a result of ICSI might have a fertility problem similar to his father's or slightly different.

Some men have an acquired cause of their sperm problem that we know will not be hereditary (i.e. vasectomy, spinal cord injury etc.). However, other men have sperm problems that may have been present since birth. These may be passed on to the male children due to a small chromosomal rearrangement, a deletion of a small portion of the Y chromosome etc. As well, men with very low sperm counts or an obstruction in their sperm ducts (vas or epididymis) may carry one of the Cystic Fibrosis (CF) genes. In this situation, the child may inherit the CF gene, and if the female partner also carries one of the CF genes there is a chance of producing a child who actually has CF.

Just as the mother's age influences the risk of birth defects, men with very low sperm counts also have an increased risk (about 1%) of producing a son with an abnormal number of sex chromosomes (i.e. XXY or XYY instead of the usual XY). These children have a normal physical appearance and are likely to have normal IQs, but they may develop learning difficulties, behavioural problems or infertility.

Blood tests can screen one or both partners for many (but not all) of these problems, including chromosomal rearrangements, CF carrier status etc. Genetic testing (amniocentesis or chorionic villus sampling) is also available during the pregnancy to look for many of these abnormalities.

What is the success rate of fertilisation with ICSI?

At City Fertility Centre, an average 70% to 80% of mature eggs will fertilise normally. Of the rest of the injected oocytes, on average about 2% may not survive the injection, some may fertilise abnormally and others may not fertilise at all. Failed fertilisation after ICSI occurs in less than 2% of cases, and more than 90% of couples undergoing ICSI will have at least one embryo to transfer.

The clinical pregnancy rates are similar to those of standard IVF and vary with the age of the woman.

It is important to note that ICSI does not guarantee fertilisation or embryo development. A number of factors may affect the success of ICSI, including:

- DNA quality of the oocyte or sperm.
- Integrity of the oocyte structure - some oocytes may not survive the injection due to instability of the membrane.

Counselling

Infertility and its treatment can be quite stressful from an emotional, physical and financial point of view. We encourage partners to be supportive and participate in the treatment process. It can also be helpful to develop a network of supportive friends and relatives.

In addition to the services of our medical and nursing staff, a consultation with our trained infertility counsellor is included in the cost of an IVF cycle. Our counsellors are highly experienced in infertility-related issues.

Cost

Please contact City Fertility Centre to receive the most current treatment cost structure.

Where to Now?

I want more information

- Contact our Fertility Advice Team or
- Book a 15 minute nurse chat

I have ICSI as part of my treatment plan

- Book an appointment with our clinic for a nurse interview
- Our nurses will discuss this with you at your appointment

Contact Us

Call 1300 354 354
Email contactus@cityfertility.com.au
Visit cityfertility.com.au

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