

ICSI Patient Information

What is ICSI?

ICSI (Intra-Cytoplasmic Sperm Injection) was developed to assist fertilisation during assisted reproduction using poor quality sperm which would otherwise not be able to fertilise the egg. The procedure is an extension of IVF where the sperm and egg are placed together in a dish, and fertilisation relies on natural selection of the sperm to fertilise the egg. With ICSI however, a single sperm is injected directly into the centre of the egg using a micro-injection needle. In this way the sperm are not required to penetrate any of the barriers surrounding the egg. Prior to the injection procedure, the eggs are stripped away from their surrounding cells using an artificial enzyme similar to that naturally released by sperm. The egg can then be assessed for maturity which is clinically important for ICSI. Once injected the eggs are incubated for a period of sixteen hours after which time they will be checked by the embryologist to see if fertilisation has occurred.



Injection of an egg during ICSI

Who needs ICSI?

ICSI is appropriate:

- When sperm is too poor for IVF such as; low count, poor movement (motility or progression) or high percentage of abnormal forms (morphology)
- When there are high levels of antisperm antibodies (e.g. following vasectomy reversal)
- When there has been previous failed or poor fertilisation during IVF
- When the sperm has been microsurgically recovered from the epididymis or testes

Men who have very few sperm (oligospermia), no sperm (azoospermia) or high numbers of abnormal sperm would previously have had little or no chance of fathering their own genetic offspring. ICSI offers such men and their partners real hope of having their own genetic child.

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What are the disadvantages of ICSI?

Some of the eggs collected during IVF may not be mature enough and therefore not suitable for injection. If only a few eggs are collected, none may be suitable for ICSI. All eggs are assessed by the embryologist once they are stripped of their surrounding cells.

As ICSI is a very delicate and relatively invasive technique, around 10% of the eggs injected may be damaged during the procedure. If this happens they cannot be used in treatment.

ICSI uses sperm that would not otherwise be able to fertilise an egg, therefore concern about potential risks to children born as a result of ICSI have been raised.

It has potentially been linked with certain genetic and developmental defects:

Increased risk of Cystic fibrosis carrier status:

5-10% of men with no sperm in their ejaculate have congenital absence of their vas deferens (the tubes that carry sperm from the testes to the penis are missing). Two thirds of these men are carriers for cystic fibrosis. Couples considering ICSI may wish to undergo genetic counselling prior to embarking on treatment.

Sex chromosome defects and inheritance of sub-fertility:

A small number of men with very low sperm counts have pieces of their genetic material missing from their Y-chromosome. Certain genes on this chromosome have been shown to be involved in the production of sperm, so deletion of these genes may be responsible for some men having few or no sperm. Consequently there may be a risk, when using this sperm, of transmission of this defect from father to son.

Some studies have suggested that where ICSI is used to treat severe male factor problems, there may be an increased incidence of sex chromosomal abnormalities in the babies being born. Up to 3.3% of fathers of ICSI babies have abnormal chromosomes, whereas in the wider population that figure is up to 2.4%.

New chromosomal abnormalities:

It is not possible to detect which eggs or sperm (gametes) have chromosomal abnormalities so gametes that might not otherwise have been able to participate in natural fertilisation could therefore be used in ICSI. Babies born after ICSI have been reported to have new chromosomal abnormalities in up to 3% of cases. The rate in the wider population is 0.6%.

Possible developmental and birth defects:

There is no clear evidence as yet whether ICSI results in higher rates of birth defects. More studies are required to gain further insight. Recent research using a very small number of children has given an indication of possible delays in mental development at one year. Other studies have not shown this link so again further research is needed.

Miscarriage:

It has been reported that the risk of miscarriage increases in proportion to the severity of the male infertility. With ICSI, it is possible that abnormal gametes which would not normally be able to produce a viable embryo, could be used. This increases the chances of an abnormal embryo. Most abnormal embryos will not implant into the womb but some might, which may lead to miscarriage.

Long term risks to children born through ICSI:

Several large follow up studies of the children born through ICSI have now been published and the results are reassuring. However, since ICSI was only introduced into clinical practice in the early 1990's, it is a relatively new technique and the children conceived are still very young. We cannot therefore predict whether ICSI will have any effect in adult life on, for example, future childbearing.