

Regional Fertility Centre

Patient Information

In-Vitro Fertilisation (IVF & ICSI)

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1.0 IVF & ICSI

IVF and ICSI (intracytoplasmic sperm injection) are both forms of assisted conception.

The treatment for both is the same, with the only difference being the method of fertilisation used in the laboratory.

Couples who are having ICSI are also having IVF but the IVF is combined with intracytoplasmic sperm injection, usually when there is a problem with the sperm or if the couple have had failed fertilisation with previous IVF.

Medical criteria for IVF or ICSI treatment

The decision of whether IVF or ICSI treatment is suitable for a couple is based on certain medical criteria and best clinical practice.

One of these criteria is that the female partner must have a BMI less than 35kg/m².

In-Vitro Fertilisation (IVF)

Literally translated the term 'In-Vitro Fertilisation' means 'in-glass'. This refers to the process whereby a woman's eggs are removed from her ovary and fertilised outside her body in the laboratory. The resulting embryos are then transferred back inside her womb a few days later. IVF is specifically suitable for women with damaged fallopian tubes or men with reduced semen quality. In addition, a large number of couples with unexplained infertility have treatment with IVF. IVF can also be used for women who are unable to produce eggs (using egg donation) or who do not have a uterus (using surrogacy).

Intracytoplasmic Sperm Injection (ICSI)

Intracytoplasmic Sperm Injection (ICSI) is similar to conventional IVF in that eggs and sperm are collected from each partner. The principal difference between the two procedures is the method of achieving fertilisation. In IVF, the eggs and sperm are mixed together in a dish and the sperm fertilises the egg 'naturally'. In order for this to occur, large numbers of actively swimming normal sperm are required. For some couples, the number of suitable sperm available may be very limited or there may be other factors preventing fertilisation.

In these cases although conventional IVF is not an option, ICSI provides an alternative. ICSI refers to the laboratory procedure in which the embryologist injects a single sperm into each egg. With this technique very few sperm are required and the ability of the sperm to enter the egg itself is bypassed. However, the ICSI procedure itself does not guarantee fertilisation as the normal cellular events of fertilisation still need to take place once the sperm is placed within the egg.

ICSI is specifically suitable in the following circumstances:

- In men with a very low sperm count
- In men whose sperm are not moving well or have a high proportion of abnormal sperm
- In men whose sperm are retrieved surgically from the testis
- In couples who have previously had failed fertilisation in conventional IVF.

Stages of IVF & ICSI Treatment

In general there are five stages to each cycle of IVF or ICSI treatment.

STAGE 1: Down regulation (used in the long agonist protocol)

Treatment usually starts by taking a nasal spray for approximately 14 days to temporarily switch off the hormonal messages from the brain to the ovaries. This usually starts on day 21 of a menstrual cycle. Daily hormone injections are then taken for ovarian stimulation. The nasal spray continues to be taken in combination with the injections in order to prevent premature release of eggs (ovulation).

STAGE 2 - Ovarian stimulation

Daily injections of follicle stimulating hormone (FSH) ± Luteinising hormone (LH) should hopefully stimulate the ovaries to produce multiple follicles (containing eggs) . The course of injections is usually about 12 days. The response of the ovaries to the injections is monitored by transvaginal ultrasound scans and sometimes blood tests to measure oestrogen levels. There are usually at least two scans during the treatment. During treatment it may be necessary to alter the dose of the hormone injections depending on the response of the ovaries as monitored by scan and oestrogen levels.

The scans are carried out at the Regional Fertility Centre (RFC), Royal Hospital site. When the follicles reach a mature size a further hormone injection (hCG) is given to ripen the eggs and prepare them for collection approximately 36 hours later.

STAGE 3 - Egg Collection

Egg collection is performed in the RFC, Royal Hospital site, using a transvaginal ultrasound probe to which a needle is attached. The fluid within each follicle is gently sucked out into a test tube, via a special pump attached to the needle, and examined by an embryologist who checks for the presence of eggs under the microscope. Intravenous pain relief is given during the egg collection which usually takes around 15-20 minutes. Although some discomfort should be expected, the vast majority of patients tolerate the procedure without difficulty. Once the egg collection is finished, patients are taken to the recovery room and are usually discharged after 1-2 hours.

On the morning of egg collection the husband/partner will be asked to provide a semen sample.

Egg collection - what are the risks involved?

A small amount of vaginal bleeding can occur for up to a day afterwards and some discomfort in the lower abdomen may persist for 12-24 hours. There is a very small risk of the needle touching a blood vessel or the bowel but the scan helps to avoid this rare problem.

In less than 1 in 300 cases, ovarian infection occurs. If this happens, pain in the lower abdomen and a raised temperature may be noticed in the days following the procedure. Treatment with antibiotics is usually adequate to clear this up although admission to hospital is usually required and very occasionally an operation is necessary.

STAGE 4 - Insemination

In IVF treatment the sperm and eggs are incubated overnight in a special fluid that provides them with all the right nutrients to allow fertilisation to occur. In ICSI treatment the eggs are injected with individual sperm before being incubated overnight. The following morning, the eggs are checked for signs of fertilisation. The embryos (fertilised eggs) are allowed to develop for between two and five days before transfer back into the womb (uterus).

After the egg collection procedure patients are told when to contact the embryologist to be advised about the fertilisation and when to attend for embryo transfer.

On the evening of the day of egg collection the woman starts using a vaginal gel/pessary containing the hormone progesterone. This is continued every evening for two weeks.

STAGE 5 - Embryo transfer

On the day of embryo transfer the embryologist will select the best embryo(s) to transfer. Embryos may be transferred on the second, third or fifth day after egg collection. The decision regarding the day of transfer usually depends on the number of embryos that are available. If there is a large number of embryos, culture is usually extended to day 5 in the hope of obtaining blastocysts.

As not all embryos will continue to develop to the blastocyst stage this extended culture will help the embryologist select the best quality embryo for transfer. In order to reduce the chance of a twin pregnancy, usually only one blastocyst is transferred due to higher chance of a pregnancy occurring with an embryo that has developed to this stage. If a couple have only 1 or 2 embryos it may be best to transfer these at an earlier stage. When embryos are not 'top quality' transfer of 2 may be considered to improve the chance of a pregnancy occurring. The embryo transfer is carried out in the RFC, Royal Hospital site. The procedure usually only takes a few minutes to perform and does not require pain relief. A speculum is inserted into the vagina in order to visualise the cervix and the embryo (s) are transferred into the uterus by passing a fine catheter, through the cervix.

Following the embryo transfer patients are encouraged to resume normal activities. Two weeks after embryo transfer of 'day 2' or 'day 3' embryos or 11 days after transfer of a blastocyst, a pregnancy test is carried out.

After embryo transfer, spare embryos judged to be of adequate quality may be frozen for later use.

2.0 EARLY EMBRYO VIABILITY ASSESSMENT (EEVA)

EEVA is a service option offered by the Regional Fertility Centre, designed to improve IVF treatment outcomes by analysing early embryo development within the incubator. This new technology, designed for IVF, ICSI and appropriate Frozen Embryo Transfer treatments continuously monitors your embryos, by time-lapse photography within the incubator, highlighting critical & subtle differences in the embryos' development.

(*EEVA can only be used when embryos have been frozen on Day 1)

The EEVA cameras sit within the incubator allowing images of the embryos to be taken every 5 minutes. The embryologist can then see each crucial step in the embryo's development without disturbing the embryo by opening the incubator door. Recent research has shown that the timing of the initial cell divisions can predict accurately, those embryos that are most likely to continue to grow on to form blastocysts. Computer scientists at Stanford University in California (Auxogyn) have designed the EEVA software to evaluate the timings of each important change, making the selection of embryos more objective. Selecting those embryos for transfer that are most likely to continue to develop and result in pregnancy is a crucial step in the IVF/ICSI process. With the introduction of EEVA, for the first time, we as a clinic will be able to use intelligent and objective computer software to assist the embryologist in making this important choice for our patients.

Benefit of EEVA

EEVA analyses the critical events in early embryo development identifying, by day 3, the embryos with the highest potential to develop to blastocysts. This should lead to the identification of the embryos most likely to implant - meaning that pregnancy rates per embryo replaced should be improved.

What EEVA cannot do

EEVA cannot change the quality of your embryos.

Charges for this service option

The charge for EEVA is £600, payable by credit/debit card. This service is not funded on the NHS however, from 1st April 2015, patients undergoing NHS treatment may choose to self fund this additional service option. Payment is required at the time of registering for EEVA.

3.0 PROBLEMS THAT CAN OCCUR DURING TREATMENT

Unfortunately not all patients respond to the drugs used for ovarian stimulation and sometimes it may be necessary to abandon the treatment before egg collection.

This may have been anticipated prior to treatment when the level of anti mullerian hormone (AMH) has been found to be low.

Some patients' ovaries may over respond to the drugs. Sometimes this excessive response requires treatment to be stopped prior to egg collection to prevent the development of Ovarian Hyperstimulation Syndrome (OHSS). On other occasions treatment may continue to egg collection but all embryos are frozen and embryo transfer takes place at a later date, when the ovaries have returned to normal.

The reason for deferring the embryo transfer is because OHSS in a patient who is pregnant is more severe and prolonged. Occasionally despite precautionary measures having been taken Ovarian Hyperstimulation can still develop and in severe cases may require admission to hospital.

Women who have a very high level of AMH are considered at risk of developing OHSS. In these women a different drug regimen is used (Antagonist Protocol) with lower doses of FSH and more intensive monitoring to minimise the risk. In the antagonist protocol no nasal spray is given. FSH/LH injections usually start on the first day of a natural or induced period with an extra daily injection of an antagonist being added in on day 3 to prevent premature ovulation.

Rarely, all of the eggs that have been collected may fail to fertilise. In these circumstances an appointment will be made with your consultant to discuss your treatment and future options.

3.0 REDUCING MULTIPLE BIRTHS

The single biggest risk of fertility treatment is multiple pregnancy.

Multiple births – what are the risks?

The increased risks associated with multiple pregnancy and birth do not just happen during late pregnancy and delivery: all stages of pregnancy have an increased complication rate.

Miscarriage

The risk of losing a pregnancy at all stages is significantly increased.

Risks to the Mother

Mothers pregnant with twins are more likely to experience problems such as high blood pressure, pre-eclampsia and pregnancy related diabetes than mothers of singletons. They are also twice as likely to die during pregnancy or birth.

Risks to the Child

The health risks for twins and triplets are greatly increased compared with those for singletons mostly because multiples tend to be born prematurely and underweight.

Prematurity can cause many problems and may even result in the death of the baby. The problems caused by prematurity can range from those that, although serious, affect only the early stages of the child's life, to those that have a devastating and lifelong impact.

You are more likely to become pregnant with twins or triplets if more than one embryo is transferred. We will therefore recommend single embryo transfer (SET), if we feel it is the best option for you. This will depend on factors such as your age and the number and quality of embryos you have available for transfer.

If you are a suitable patient, you can largely remove the risk of multiple births, while maintaining your overall chance of having a baby, by having SET followed by any frozen embryo transfers if necessary.

The embryologist will carefully select and transfer the embryo that is most likely to implant itself in the womb. Any remaining embryos with a good chance of implantation can be frozen and stored.

If you do not become pregnant, the frozen embryos will be thawed and transferred one at a time until you become pregnant or all the embryos have been used.

For more information on SET see the 'one at a time' website: www.oneatathetime.org.uk

4.0 EMBRYO FREEZING

Freezing and storing embryos

Patients attending for IVF or ICSI treatment often have embryos remaining after their cycle is complete. Embryo freezing can be used to store (cryopreserve) unused embryos provided that they are of sufficiently good quality. The frozen embryos can then be thawed and transferred sometime after IVF / ICSI treatment, whether or not it has been successful. This is known as a Frozen Embryo Transfer (FET).

Your chances of becoming pregnant with a thawed frozen embryo are not affected by the length of time the embryo has been stored, but, due to the freezing and thawing process, your chances of having a baby using a thawed frozen embryo may be lower than with a fresh embryo.

5.0 SUCCESS RATES

For success rates please refer to our website – www.rfc.hscni.net

6.0 COUNSELLING

Undergoing fertility treatment can be stressful and can affect your domestic, social and working life. The Regional Fertility Centre provides a specialist counselling service which you can access at any time before, during and after treatment.

People often feel a range of confusing or unusual emotions for example: depression, anxiety, anger or hostility, guilt, feelings of grief and loss, problems with sleeping or eating, and difficulties in coping in social and work situations which would not usually be a problem.

As treatment and infertility affects both partners it is usually more positive for couples to attend together.

The role of the counsellor is to offer emotional and psychological support at a time when it is needed. The details of your appointments with the counsellor are confidential.

You can arrange an appointment with a specialist counsellor yourself by telephoning (028) 9073 6081 on Monday – Friday between 9.00am to 4.30pm).

The appointment takes place at the office of the Fertility Counselling Service, Ground Floor, Unit 2, 18 Heron Road, Belfast, BT3 9LE. If you prefer the counsellor can arrange to see you in the Regional Fertility Centre.

Each session usually lasts up to one hour. In many circumstances one or two sessions may be required but if you or the counsellor feels that further time is needed, this can be arranged.

There is no charge to you for this service.