

In-vitro fertilisation: IVF – information leaflet

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In IVF a number of eggs are collected from the woman's ovaries. Sperm are then used to fertilise them outside the woman's body. They are incubated and grown for about 2-3 days (sometimes up to 5 days for something called 'blastocyst culture'), after which up to a maximum of two embryos are replaced in the woman's womb. Hopefully one of the embryos (or possibly both) may then implant and grow into a baby. Far fewer sperm are needed for conception than in the normal course of events, and since the procedure also bypasses the Fallopian tubes that connect the ovaries with the womb it can help couples with a variety of problems, including:

- ⤴ blocked tubes
- ⤴ low sperm counts and sperm quality
- ⤴ problems where the woman's immune system is hostile to the man's sperm
- ⤴ prolonged unexplained infertility
- ⤴ failure to conceive as a result of other subfertility treatments

Preliminaries

A preliminary appointment with a member of the clinic staff is usually arranged for the purposes of assessment and discussion about the procedure. This preliminary appointment may include:

- ⤴ discussion and review of the problems and investigations that have led to referral for IVF
- ⤴ consideration of the limitations of treatment, possible alternative treatments, the chances of success, the need to consider a 'course' of treatments rather than a 'one-off' attempt and the possibility that treatment may not succeed
- ⤴ the importance of counselling and the clinic's policy relating to this
- ⤴ practical aspects of the treatment, what it would involve and possible complications
- ⤴ reviewing tests that may already have been performed and possibly arranging further preliminary tests (these may include blood tests from the man and the woman and/or semen assessment). It is necessary for men and women being treated in our clinic to have negative Hepatitis B&C and HIV blood tests
- ⤴ arranging written consent to treatment that complies with regulations
- ⤴ arranging a provisional schedule for treatment

An appointment with the nurse co-ordinator would then be arranged to cover practical aspects of treatment (including instruction in self-injection where necessary)

Counselling

The UK Human Fertilisation & Embryology Authority requires all clinics that perform IVF to offer independent counselling to couples. This is not some kind of 'assessment' procedure, is totally confidential, and is offered for a variety of reasons including:

- △ to ensure that couples have fully thought through many of the non-clinical issues of their condition and treatment as it may relate to their own lives, the lives of any existing children, and the lives of the children who may be born as a result of treatment;
- △ where the couple want it, to provide expert independent support and possibly even counselling therapy to mitigate some of the emotional stresses involved with treatment, especially if it is unsuccessful

Whether a couple wish to take up the offer of counselling prior to treatment is entirely their own choice except in cases involving egg or sperm donation.

Planning and procedure

Provided that the couple are suitable and wish to proceed with treatment the next stages are:

- △ a 'planning' appointment with the nurse-co-ordinator to finalise the schedule for the injections, scans, blood tests, and treatment; reiterate the procedure in the event of an emergency; and provide an emergency contact phone number.
- △ A course of hormone treatment, usually using a combination of tablets and injections, to stimulate a number of eggs to develop on the ovaries. This is monitored by visits to the clinic for ultrasound scanning, especially during the week leading up to egg collection. Couples are usually taught to perform their own injections. The hormones and drugs used for treatment are not believed to have a significant likelihood of causing serious long-term adverse health effects, but absolute safety is difficult to prove. Some studies have suggested a possible association between treatment and an increased risk of ovarian cancer later in life, but others have suggested this is not the case or the effect may not be causal. Although some clinics perform 'natural cycle' IVF without hormone stimulation the success rate is very poor. It is not recommended by the National Centre for Clinical Excellence (NICE) and it is very difficult to schedule. Our clinic does not perform 'natural cycle' IVF, therefore.
- △ 'egg retrieval' - a minor procedure in which a needle is guided by the ultrasound scanner into the ovaries to suck some of the eggs out. This is performed using local anaesthetic and a pain-killer/sedative combination. It usually takes about 20 - 30 minutes. A partner or a close friend could accompany the woman and remain with her throughout if desired. It should be possible to leave hospital a few hours later. An appointment is made for the woman to attend the clinic at Heavitree Hospital on the morning of the operation. She should have had nothing to eat or drink from midnight and there should be someone who could pick her up a few hours later, take her home and stay with her overnight. For those people with homes more than one hour's travelling distance away it may be advisable to stay locally in a hotel overnight. Complications from the egg retrieval procedure are

unlikely but may include allergic or other complications from the sedative and anaesthetic drugs; bleeding, with a possible need for blood transfusion or surgery; infection; damage to internal organs including blood vessels and intestines, possibly requiring surgical treatment.

- ⤴ Unless frozen sperm are to be used the man needs to produce a sample on the day of egg collection. It may be necessary for the sample to be produced in a room on the premises in some cases;
- ⤴ the eggs are fertilised in the laboratory using the man's sperm. One of two possible methods may be used. In 'conventional IVF' a number of sperm are added to an egg in the laboratory to encourage 'natural' fertilisation. Problems may be present, however, that reduce the chance of natural fertilisation and a procedure called 'ICSI' may be recommended. In this case an individual sperm is selected using a special microscope and injected into an egg. This may result in a higher chance of fertilisation but adds to the cost of treatment and is associated with a slightly higher chance of an abnormality in a baby born from treatment. Sometimes it may be suggested that conventional IVF is used for some of the eggs and ICSI for the others
- ⤴ embryo transfer - the couple will be asked for a telephone number at which they can be contacted during the 24 to 48 hours after egg recovery. If the eggs fertilise the woman is asked to attend the Fertility Clinic for a minor and generally painless procedure usually two to three days after the egg recovery operation in order to replace up to two of the fertilised eggs. By then these would have developed into embryos and they are placed in the womb by injecting them through a soft plastic tube passed through the cervix.

A pregnancy test should be performed two weeks after the embryo transfer and, if positive, an ultrasound scan may be arranged approximately two weeks later. If it is negative a follow-up debriefing appointment may be arranged. Some couples may prefer to have a 'telephone' debriefing consultation.

Embryo Freezing

It may be possible to freeze and store some of the embryos for up to 10 years if they are of good quality. Our clinic's policy is to allow storage for up to just 5 years in the first instance, but the man and the woman may request extension upon application in the fifth year to the clinic. The embryos may subsequently be thawed and transferred to the woman's womb in the same way as fresh embryos. Only embryos of a minimum quality are likely to survive the freezing and thawing process and success rates with frozen embryo transfer are generally slightly less than when fresh embryos are used. On the other hand a treatment cycle with frozen embryos is usually less costly and complicated than one creating fresh embryos. Freezing may also have particular advantages for couples attempting to conceive their first baby when the woman is older since if the treatment is successful the chance of success with further IVF may have declined significantly due to the increase in age if or when they wish to try for another. Additional counselling and consent procedures are required for freezing and the following points will need consideration:

- ⤴ how long the couple wish the embryos to be stored

- ⤴ the possibility that no embryos will survive freezing and thawing
- ⤴ a possible greater chance of success if the freezing is performed on the day after fertilisation at what is called the 'pronucleate' stage. On the other hand freezing at this stage will reduce the number available to choose from for fresh embryo transfer, and so freezing pronucleate embryos may only be advisable if there is a large number available
- ⤴ although some freezing techniques (e.g. 'vitrification') may improve the chance of success they also make it more difficult to transport embryos between clinics if this was to be required at a future date
- ⤴ Despite all reasonable precautions situations may arise that are beyond the clinic's control (e.g. fire, flood, terrorism, malicious damage etc.) that may lead to the loss of stored embryos. It is very difficult to obtain insurance to compensate couples for the loss of their embryos in such an unlikely event (if, indeed, anything could compensate for this) and it is therefore only possible for us to undertake storage on the understanding that the Clinic will not be held liable for losses due to circumstances beyond our control.

SINGLE EMBRYO TRANSFER

In some cases the chance that a single treatment would result in the birth of a live healthy baby may be only slightly less when one embryo is replaced compared with two. Because of the risks of multiple pregnancies, which include risks to the mother's health, premature birth and possibly even handicap to one or more of the babies, we are required by the HFEA to restrict the number of embryos transferred to women aged under 40 to two. The limit over the age of 40 is three. Couples may wish to choose to transfer a single embryo and possibly freeze spare ones, and this is actually required (and funded) in certain NHS-funded treatments.

The HFEA requires IVF clinics to have policies that are designed to try to ensure that the overall multiple birth rate from IVF in their centre does not exceed a target value that they set. This requirement may have an impact on the number of embryos that we can transfer in some individual cases.

OUTCOME:

Chance factors, believed to be due in most cases to natural variations in the genetic make-up of eggs and sperm, are an important element in IVF success. A leaflet detailing our success rates is available, and these are also published on the HFEA website. Comparing success rates between clinics may be an unreliable guide to the chance of conception for an individual couple at one clinic versus another because important variations may exist in the selection of patients for treatment between clinics. Many, for example, recommend IVF at an earlier stage or in different circumstances than others.

Although national data and also that from our own clinic shows that success is possible even after many unsuccessful treatments it is recommended that couples

should be advised that the success rate is uncertain after multiple attempts. If a treatment has been unsuccessful there may be many possible reasons:

- ⤴ Failure to respond to the drugs - sometimes people do not respond to the drugs that are given to stimulate ovulation. A previous good response does not always guarantee a good response the next time;
- ⤴ Failure to obtain eggs from the ovaries. The eggs develop in small fluid-filled sacks called 'follicles'. Sometimes although the ovarian scans show the presence of follicles it may not be possible to find eggs in them at the egg recovery operation;
- ⤴ Failure of the eggs to fertilise or develop into embryos;
- ⤴ Failure of embryos to implant in the womb;

If several IVF treatments fail further investigations and treatments may be considered with varying degrees of evidence to support them. These may include: checking the inside of the womb with a telescope (hysteroscopy); blood tests to check for unsuspected genetic abnormalities in the man or woman (karyotyping); tests for various immune conditions; adjuvant treatment with steroid drugs, antibiotics, aspirin, heparin, Intralipid, DHEA and a continually growing list of others.

Abnormalities:

Approximately 3-5% of babies are born with some form of abnormality if some minor abnormalities are counted. IVF treatment is associated with an increase of 1-2% above this, which may include genetically transmitted problems from men whose sperm counts are very low and a very rare (although serious) condition called 'Prader-Willi' syndrome. Possible problems related to ICSI may include an increased risk of cystic fibrosis; minor anatomical abnormalities such as childhood hernias or 'hole-in-the-heart' defects; developmental delay; and also abnormalities of the male Y-chromosome that may result in male children also experiencing problems with their fertility. The possibility that some of the procedures involved in IVF and/or embryo freezing may give rise to as yet unsuspected problems should be considered.

Disposal of embryos:

IVF is a procedure that is highly regulated by law in the UK because of the ethical and moral issues surrounding the creation of human embryos and the disposal of those which cannot be placed back in the woman's womb. Spare embryos that are not to be frozen are required to be disposed of sensitively according to legal requirements.

Welfare of child

Centres are required to take into account not only the request of couples seeking treatment, but also the welfare of any child which may be born as a result as well as that of existing children in the household or family. So far as our clinic is concerned this usually means that:

- ⤴ Treatment will usually only be offered to couples who are committed to a stable long-term relationship and who are prepared to consent to be the legal mother and father of the child or children resulting from treatment. In cases where a child born from treatment would have no

legal father (e.g. posthumously) the onus is on the woman or couple undergoing treatment to provide written assurance to the satisfaction of clinic staff of arrangements to ensure that the needs of that child for a father would be met

- ⤴ There should be no substantial risk that the child would inherit or contract a serious medical disease
- ⤴ The prospective parents should enjoy sufficiently good health such that the parental needs of a child could be met without serious difficulty
- ⤴ The man should be not be older than 60 years, and the woman not more than 50 years
- ⤴ We would not be able, or prepared, to treat couples where there is a background on either side of child abuse or violence and couples must be prepared (if necessary) to give their consent for inquiries to be made of the police or social services to ensure that this is not the case. We are also required to obtain the consent of couples to consult with their General Practitioners in case there are any other factors which may have a bearing on eligibility for treatment

Confidentiality:

More than the usual degree of medical confidentiality covers information about IVF treatment. Except in an emergency the centre undertaking treatment is not allowed to communicate with others (including GPs) about it except with the express written permission of the couple concerned. Information is, however, sometimes given to the couple to pass on to their doctor or to others. Because of this regulation it may be necessary to obtain written permission to pass on some general details of treatment to hospital and Health Authority staff who may be involved in it in a peripheral way and with the administration of its funding. This information would be treated with the same confidentiality as that accorded to other medical information.

Complaints:

Decisions on the eligibility of individuals and couples for NHS funding are outside the control of the clinic and are made by the relevant NHS funding organisation. All contractual arrangements for treatment and responsibility for professional services are deemed to be between the person or couple being treated and the consultant with overall responsibility for his, her or their care. Complaints may be made formally in writing or informally to the consultant with overall responsibility for the couple's care, usually Mr. Jonathan West FRCS FRCOG, at the main clinic address. A copy of the formal complaints procedure is available on request.