

Different Kinds of Assisted Reproductive Technologies

Donor eggs (eggs from another woman), donor sperm, or already frozen embryos are sometimes used in assisted reproductive technology treatments. When a woman or man has a genetic illness that can be passed down to the baby, donated eggs or sperm may be used. Donor embryos can also be used by an infertile woman or couple. These are embryos that were produced by couples undergoing infertility therapy or from the donor sperm and eggs. The donor embryo is then implanted in the uterus. Zygote intrafallopian transfer (ZIFT), gamete intrafallopian transfer (GIFT), frozen embryo transfer, and in vitro fertilisation-embryo transfer (IVF-ET) are all examples of assisted reproductive technology (ART).

Oocyte donation and gestational carriers are likewise covered by these approaches. IVF-ET has been used in around 99 percent of ART cycles. When previous treatments (such as intrauterine insemination, etc.) have failed, or when there is significant male factor infertility, severe endometriosis, or tubal blockage, ART may be advised.

Different types of Assisted Reproductive Technology (ART)

Different techniques and reproductive cells are used in various types of ART procedures. Depending on the circumstances, a doctor can recommend which ART procedure is most appropriate. In vitro fertilisation (IVF) is the most commonly preferred.

1. In vitro fertilisation (IVF):

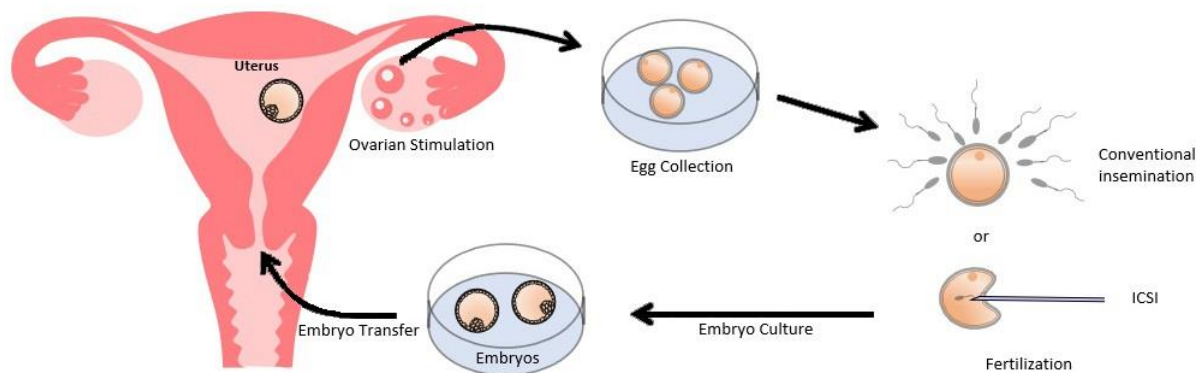
IVF stands for in vitro fertilisation, which refers to fertilisation outside the body. In IVF, a specialist extracts eggs and fertilises them in a laboratory. Specialists can combine this with IVF-ET and transfer the resulting embryos into a woman's uterus. It may take more than one IVF round to conceive, and some people may not be able to conceive at all even with IVF.

Procedure for IVF

The following are some common steps involved in the procedure:

1. During fertilisation, the oocytes are inseminated in vitro. Before being concentrated for motile sperm, the semen sample is washed several times with tissue culture material before being introduced to the oocyte-containing medium.
1. Intracytoplasmic sperm injection—the injection of a single sperm into each oocyte might be attempted at this point, especially if the male partner's spermatogenesis is abnormal.

2. Embryo culture: The oocytes are cultured for 2 to 5 days after sperm is added.
1. Embryo transfer: Only one or a few of the resultant embryos are transferred to the uterine cavity, reducing the likelihood of a multifetal pregnancy, which is the most serious risk associated with IVF.
1. Controlled ovarian stimulation: A gonadotropin-releasing hormone (GnRH) agonist or antagonist is routinely used to prevent premature ovulation. After adequate follicular growth, human chorionic gonadotropin (HCG) is injected to stimulate final follicular maturation and ovulation.
1. Oocyte retrieval: About 34 hours after HCG injection, oocytes are harvested by direct needle puncture of the follicle, usually transvaginally with ultrasound guidance or less commonly laparoscopically.



Schematic diagram of IVF treatment

Advantage of IVF

- Increased chances of fertilisation and pregnancy are among the advantages of IVF.
- IVF can be used to treat infertility caused by oligospermia, sperm antibodies, tubal dysfunction, or endometriosis, as well as unexplained infertility.

Side effects for IVF

Side effects from fertility medicines such as ovarian hyperstimulation syndrome might result in:

- Multiple pregnancies or two or more embryos implanting at the same time.
- An ectopic pregnancy occurs when the embryo develops outside the womb.
- **ZIFT**

Zygote intrafallopian transfer (ZIFT) or tubal embryo transfer are two terms for the same procedure. This is comparable to IVF. fertilisation takes place in a laboratory. The embryo is then moved to the fallopian tube rather than the uterus.

- **GIFT**

The process of transferring eggs and sperm into a woman's fallopian tube is known as gamete intrafallopian transfer (GIFT). Fertilisation occurs in the female's body.

- **ICSI**

Male factor infertility is commonly treated with intracytoplasmic sperm injection (ICSI). At times, it is also utilised by elderly couples or those who have had failed IVF attempts. ICSI involves injecting a single sperm into a mature egg, as opposed to conventional fertilisation, which involves placing the egg and sperm in a petri dish together and the sperm fertilising the egg on its own.

Conclusion

Assisted reproductive technology (ART) refers to fertility treatments and procedures that can aid in the conceiving of children when couples are having difficulty or are unable to do so naturally. ART procedures entail manipulating eggs, sperm, or embryos to improve the chances of a successful pregnancy. When persons are unable to conceive after a period of regular sexual intercourse without the use of birth control, they are said to be infertile. While most people use ART to treat infertility, it can also be used for hereditary reasons or to avoid pregnancy difficulties. ART is also known as fertility treatment or medically assisted reproduction by some people. Multifetal pregnancy is possible with ARTs, but the risk is significantly lower than with controlled ovarian stimulation. If there is a high risk of genetic problems, the embryo can frequently be checked for them before being transferred.

** Internet and public domain resources have been used to collate the material.*

Source : Unacademy , Hong Kong Assisted Reproduction Centre