What is assisted reproductive treatment (ART)?

VARTA provides independent information about fertility treatment. This brochure describes the main options available. When considering fertility tests and treatments, VARTA recommends asking the following questions:

- Do I really need this test, treatment or procedure?
- What are the risks?
- Are there simpler, safer options?
- What happens if I don't do anything?
- What are the costs?
- Will it improve my chance of having a baby?

What is ART?

Assisted reproductive treatment (ART) is used to help people achieve pregnancy. ART can be used:

- as infertility treatment for heterosexual couples
- to help people who identify as LGBTIQ+, and single people have children
- by people who can't become pregnant or carry a pregnancy without treatment
- to reduce the risk of a child inheriting a genetic disease or abnormality.

Types of assisted reproductive treatment

Simple treatment options

Ovulation induction

Ovulation induction (OI) can be used if somebody is not ovulating or not ovulating regularly. It involves taking a hormone medication (tablets or injections) to stimulate ovulation. The response to the hormones is monitored with ultrasound and when the time is right, an injection is given to trigger ovulation (the release of the egg). Timing intercourse to coincide with ovulation offers the chance of pregnancy.

Artificial insemination

Artificial insemination (AI), which is sometimes called intrauterine insemination (IUI), involves insertion of sperm into a person's uterus at or just before the time of ovulation. AI can help couples with so called unexplained infertility or when there is a minor sperm abnormality.

AI can be performed during a natural menstrual cycle, or in combination with ovulation induction if a person has irregular menstrual cycles. If a pregnancy is not achieved after a few AI attempts, IVF or ICSI may be needed.

Advanced treatment options

In-vitro fertilisation (IVF)

During IVF, hormone injections are used to stimulate the ovaries to produce multiple eggs. When the eggs are mature, they are retrieved in an ultrasound-guided procedure under light anaesthetic. The eggs and sperm are placed together in a laboratory to hopefully form embryos. Three to five days later, if an embryo has formed, it can be either placed in the uterus (fresh embryo transfer) or frozen to be transferred into the uterus at a later time (frozen embryo transfer). Any additional embryos can be frozen and used later if the first transfer does not work.

Hormone stimulation	Fertility drugs are given to develop several eggs (stimulated cycle).	
Egg retrieval	Eggs are collected.	
Embryo development	Sperm is added to the eggs for embryos to form. Sometimes more than one embryo develops that is suitable for transfer. When there are several embryos available for transfer, one is usually transferred* and the remainder frozen for later use if there is no pregnancy. Sometimes all embryos are frozen.	
Embryo transfer	An embryo is placed in the uterus. Two weeks later a blood test is done to see if the embryo has implanted and the woman is pregnant.	
Clinical pregnancy	If the test is positive an ultrasound is done two to three weeks later to verify the pregnancy. A pregnancy at this early stage does not guarantee the birth of a baby because some pregnancies end in miscarriage.	

* Single embryo transfer (transferring one embryo at a time) is considered the gold standard of practice in IVF to minimise the risk of multiple pregnancy which is associated with higher risks for both mother and babies.

Intracytoplasmic sperm injection (ICSI)

Intracytoplasmic sperm injection (ICSI) is used to overcome sperm problems. ICSI follows the same process as IVF, except ICSI involves the direct injection of a single sperm into each egg to hopefully achieve fertilisation (whereas in IVF the egg and sperm are left in a petri dish to fertilise on their own).

Because it requires technically advanced equipment, there are additional costs for ICSI. For couples with male factor infertility, ICSI is needed to fertilise the eggs and give them a chance of having a baby. But for couples who don't have male factor infertility, the chance of a baby is no better with ICSI than with IVF.

Using donor sperm, eggs, or embryos

There are many reasons why donor sperm, eggs or embryos may be needed. Your fertility specialist and the clinic counsellor will provide you with information about using donor sperm, eggs or embryos and can discuss the social, emotional, and legal considerations.

What is assisted reproductive treatment (ART)?

Donor sperm

Donor insemination (DI) may be used by:

- single people
- same-sex couples
- couples where the male partner does not produce any sperm or no normal sperm
- couples with a high risk of a man passing on a genetic disease or abnormality to a child.

The process of DI is the same as artificial insemination (AI). If the female partner also has an infertility problem, donor sperm can be used in IVF treatment.

Donor embryos

Donor embryos can be used if a person or couple requires both donor sperm and donor eggs to achieve a pregnancy. In rare cases, some people donate embryos they don't need to other people. The recipient takes hormones in preparation for the embryo transfer and when the lining in the uterus is ready, embryos are thawed and transferred.

Donor eggs

Treatment with donor eggs may be needed when:

- a person doesn't produce eggs, or their eggs are of low quality. This may be due to age or premature menopause (ovarian failure)
- a person has experienced several miscarriages, or
- there is a high risk of a person passing on a genetic disease or abnormality to a child.

In these cases, the egg donor has hormone injections to produce several eggs. When the eggs are mature, they are retrieved and sperm from the recipient's partner or a donor is added to the eggs. Two to five days later, when embryos have formed, one is inserted into the recipient's uterus. In the two to three weeks leading up to the embryo transfer, the recipient takes hormones to make sure the lining in the uterus is ready for an embryo to implant. If a pregnancy is confirmed, the hormone treatment continues for another eight to 10 weeks.

Preimplantation genetic testing (PGT)

When preimplantation genetic testing (PGT) is used, embryos are generated through the process of IVF or ICSI and then a few cells are removed from the embryo and tested for normality.

For people who are at high risk of passing on a genetic condition to their offspring, embryos can be tested before they are transferred to make sure only unaffected embryos are transferred. PGT for monogenic/single gene defects (PGT-M) is used to identify embryos that are not affected by a 'faulty' gene that can lead to disease. PGT for chromosomal structural rearrangements (PGT-SR) is used to identify embryos that have an incorrect amount of genetic material. PGT-M and PGT-SR are also known as preimplantation genetic diagnosis (PGD).

Some clinics offer preimplantation genetic testing for aneuploidy (PGT-A). PGT-A, is an add-on used to help choose embryos with the right number of chromosomes. While PGT-A can reduce the time it takes to get pregnant by eliminating embryos unlikely to produce a live birth, it doesn't increase the overall chance of having a baby. It's also costly and there is a small risk that healthy embryos are discarded.

Surrogacy

Surrogacy involves a person carrying a child for another person or couple with the intention of giving the child to that person or couple after birth. VARTA has resources to assist people considering surrogacy.