Types of assisted reproductive treatment

Assisted reproductive treatment (ART), also known as assisted reproductive technology, refers to treatments used to assist people in achieving a pregnancy. ART covers a wide spectrum of treatments. Depending on the cause of infertility, the following types of treatment may be suggested.

**Ovulation induction (OI)**

Ovulation induction may be used by women who are not ovulating or are not ovulating regularly. Ovulation induction involves taking a hormone medication (tablet or injection), which stimulates the production of follicle-stimulating hormone. This encourages the development of one or more follicles. When the follicles are large enough, another hormone is administered which releases the egg from the follicle. If the couple has intercourse around this time, the chances of conception are greatly increased.

**Artificial insemination (AI)**

Artificial insemination, also known as intrauterine insemination (IUI), is used to treat women who have normal and healthy fallopian tubes, but for unknown reasons cannot conceive. This may be due to mechanical difficulties with intercourse – for example a man is not able to achieve an erection or has structural problems of the penis after trauma or surgery. Artificial insemination might also be used when semen has been frozen due to a male partner’s absence or prior to cancer treatment.

The process of AI involves insertion of a male partner’s semen through the female’s cervix and into the uterus at or just before the time of ovulation. AI can be performed during a natural menstrual cycle, or in combination with ovulation induction if the woman has irregular menstrual cycles. Only doctors can perform AI under the *Assisted Reproductive Treatment Act 2008*, although a person is not prevented from performing self insemination. If a pregnancy is not achieved after a few AI attempts, the use of IVF or ICSI may be discussed.

**Donor conception**

There are several ways that donor sperm, eggs or embryos can be used in ART treatments. VARTA has a range of resources to assist you.

**Donor sperm (donor insemination)**

Donor insemination (DI) may be used when:

- a male partner does not produce sperm,
- a male partner does not produce normal sperm, or
• there is a high risk of a man passing on a genetic disease or abnormality to a child.

Donor insemination may also be used by single women and women in same-sex relationships. The process of donor insemination is the same as artificial insemination.

**Donor eggs**

Treatment with donor eggs is possible if:

• a woman cannot produce eggs or her eggs are of low quality. This may occur due to age or premature ovarian failure (where the woman no longer produces mature eggs for ovulation).
• a woman has experienced several miscarriages, or
• there is a high risk of the woman passing on a genetic disease or abnormality to a child.

In these cases, the egg donor undergoes hormone stimulation to produce multiple 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 are formed, an embryo is inserted into the recipient woman's uterus. The recipient woman may take hormones in preparation for the embryo transfer, and for approximately 10 weeks after the embryos have been transferred.

**Donor embryos**

Donor embryos can be used if a person or couple requires donor sperm and donor eggs to achieve a pregnancy. Although rare, some people choose to donate frozen embryos that they no longer need (after IVF procedures, for example) for use by others undergoing IVF. When the recipient woman is ready, embryos are thawed and transferred to her uterus.

**in-vitro fertilisation (IVF)**

IVF is used in a range of circumstances to assist with conception but is often the only means of achieving pregnancy for women whose fallopian tubes are blocked. In IVF, the woman’s eggs are collected, along with sperm from the male partner or donor. The egg and sperm are left in a culture dish in the laboratory to allow the egg to be fertilised. If fertilisation occurs and an embryo develops, the embryo is then placed into the woman's uterus in a procedure called an embryo transfer. Sometimes multiple embryos may develop, and they can be frozen for use in later transfer procedures.
### The IVF process

**Start of treatment cycle**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hormone stimulation</strong></td>
<td>Fertility drugs given to develop a number of eggs (stimulated cycle). In a natural cycle, no superovulatory drugs are used.</td>
</tr>
<tr>
<td><strong>Egg retrieval</strong></td>
<td>Eggs are collected.</td>
</tr>
<tr>
<td><strong>Embryo development</strong></td>
<td>Sperm is added to the eggs for embryos to develop. Sometimes more than one embryo develops that is suitable for transfer. When there are several embryos available for transfer, most commonly one is transferred and the remainder frozen for later use if there is no pregnancy. Sometimes, all embryos are frozen.</td>
</tr>
<tr>
<td><strong>Embryo transfer</strong></td>
<td>An embryo is placed in the uterus where it may implant and grow into a baby.</td>
</tr>
<tr>
<td><strong>Clinical pregnancy</strong></td>
<td>A pregnancy verified by ultrasound at approximately six–seven weeks into the pregnancy. A clinical pregnancy does not guarantee the birth of a baby, as miscarriages can occur.</td>
</tr>
<tr>
<td><strong>Live birth</strong></td>
<td>The birth of a living baby or babies (multiple births are classed as a single live birth).</td>
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</tbody>
</table>

¹ 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 are associated with higher risk to both mother and babies.

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**Possible health effects of IVF**

**Cost of IVF**

**Understanding IVF success rates**

**A couples successful IVF treatment**

**A future without children (a women's perspective)**

**A future without children (a man's perspective)**
GIFT was launched as a more ‘natural’ version of IVF. Instead of fertilisation occurring in a culture dish in a laboratory, the woman’s eggs are retrieved from her ovaries and inserted between two layers of sperm in fine tubing. This tubing is then fed into one of the woman’s fallopian tubes, where the egg and sperm are left to fertilise naturally. GIFT is no longer commonly used. However, it is sometimes used as an option for couples who don’t want to use IVF for religious reasons, providing that the woman's fallopian tubes are functioning.

ICSI is used for the same reasons as IVF, but especially to overcome sperm problems. Essentially, ICSI follows the same process as IVF, except ICSI involves the direct injection of a single sperm into each egg to achieve fertilisation.

Preimplantation genetic diagnosis (PGD)

Preimplantation genetic diagnosis (PGD) is used to reduce the risk or avoid transmission of a genetic disease or chromosomal abnormality. PGD can be used by couples who have, or have a family history of, a genetic disease or chromosomal abnormality that they risk passing on to their children. PGD is also used for couples who have had repeated miscarriages or repeated IVF failure and also for women of advanced maternal age (generally over 36-38 years of age).

In PGD, embryos are generated through the process of IVF or ICSI and then one or two cells are removed from the embryo and are screened for a genetic condition. Embryos unaffected by a particular genetic condition may then be selected for transfer to the woman's uterus.

**What is preimplantation genetic diagnosis?**

Assisted reproductive treatment clinics in Victoria perform PGD to reduce the risk of, or to avoid a range of conditions.

Sex selection can be performed in Victoria only to reduce the risk of transmission of a genetic disease or abnormality to a child. Sex selection may be performed to reduce the risk of transmission of a disorder linked to an X chromosome (such as Muscular Dystrophy or Haemophilia) or for a condition that occurs more frequently in one sex but where the genetic cause is unknown (e.g. autism).

Aneuploidy is a term used to describe an abnormality in chromosome number (fewer or more of a specific chromosome). Aneuploidy screening is performed in cases of advanced maternal age, repeated IVF failure, recurrent miscarriage and previous aneuploidy pregnancy.

If there is a disorder that you are particularly concerned about, contact your ART clinic.

**Surrogacy**

*Surrogacy is a form of ART in which a woman (the surrogate) carries a child for another person or couple with the intention of giving the child to that person or*
couple after birth. VARTA has a range of resources to assist you.

The information provides a general overview of the various techniques. More information about ART methods can be obtained from Victorian registered ART clinics.

What is assisted reproductive technology (ART?)

Related content:

Are you eligible to have treatment?
Considering IVF, donor treatment or surrogacy overseas?
Emotional, physical and practical considerations of ART
Assisted reproductive terminology
Understanding IVF success rates

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