

# Assisted Reproduction

**Assisted reproduction** is a possibility how to provide own children for couples who have not been able to do this naturally. These techniques are connected with the manipulation of germ cells or embryos and are usually used when medical or surgical treatment is not successful.

## History

- 1978 - first child by IVF - Louise Brown,
- 1982 - first child in the Czech Republic - Brno,
- present - more than 1% of all babies are born through assisted reproduction.

## Intrauterine insemination (IUI)

Intrauterine insemination means the introduction of a man's sperm into a woman's uterus. It can be either homologous, where the woman is inseminated with her partner's sperm, or heterologous, where the sperm of an anonymous donor is used. The sperm must first be separated from the seminal fluid and then introduced into the uterus using a catheter. Usually, the ovaries are hormonally stimulated beforehand and insemination is performed on the day of expected ovulation. The IUI method has a very low success rate and even after ovarian stimulation, the success rate is between 5-15% per cycle.

## In vitro fertilization (IVF)

The original indication for this method was missing or dysfunction of uterine (Fallopian) tubes. Now, IVF is also used in cases where all other methods have failed.

### IVF procedure

#### ■ Induction of superovulation

Ovulation (superovulation) is stimulated hormonally to produce a larger number of ova. When the mature follicles are present (demonstrated by blood oestradiol concentration and ultrasound), the oocytes are removed.

#### ■ Oocyte retrieval (ovum pick up)

The most commonly used method is ultrasound-guided puncture of mature follicles. It is carried out under short-term anaesthesia under ultrasound control through the vaginal route. Afterwards, the follicles are aspirated into a container with a culture medium and then identified under a microscope.

#### ■ Fertilisation (fertilisation of the ova)

First is determined the stage of maturity of the oocytes, based on morphological criteria and then incubated. Sperm are then added to the culture medium with the oocytes and we wait if fertilisation occurs.

#### ■ Embryo transfer (ET)

It is performed through the vaginal route by a thin cannula through the cervix. Usually 2 or 3 embryos are transferred (the greater number, the greater the risk of multiple pregnancy and), the others can be frozen (cryopreservation) and used in the next cycle. Closely related to this method is: assisted hatching (gentle disruption of the zona pellucida) or preimplantation genetic diagnosis.

## Intracytoplasmic sperm injection (ICSI)

The ICSI method is the most commonly used micromanipulation technique. It is applicable and also recommended in all cycles of ectopic fertilization as it significantly increases the success rate. The principle of this method is the direct injection of a single sperm into the cytoplasm of a mature oocyte. First, the selected sperm is immobilised, sucked into a micropipette and then injected into the oocyte using a micromanipulation device. Indications for ICSI may be, for example, reduced sperm count or lack of sperm motility, the presence of an immunological factor of infertility or if the preimplantation genetic diagnosis is planned.

## Links

### Related sources

- Menstrual cycle
- Evaluation of semen analysis



In vitro fertilization

- Preimplantation genetic diagnosis
- In vitro fertilization
- Ovarian hyperstimulation syndrome

## External links

- Institut reprodukční medicíny a endokrinologie Fakultní nemocnice Plzeň (<http://www.fertilizace.cz/index.html>)
- Centrum reprodukční medicíny a reprodukční genetiky 2. LF UK a FN Motol (<http://www.ivf-motol.cz/ivf.aspx>)
- ICSI: Intracytoplazmatická injekce spermií (<https://www.repromeda.cz/poskytovana-pece/lecba-neplodnosti/ivf/metody-oplozeni/icsi/>)

## Literature

- KAPRAS, Jan – KOHOUTOVÁ, Milada. *Kapitoly z lékařské biologie a genetiky III.* 1. edition. Karolinum, 2007. 101 pp. ISBN 978-80-246-0001-7.
- KOČÁREK, Eduard. *Molekulární biologie v medicíně.* 1. edition. Národní centrum ošetrovatelství a nelékařských zdravotnických oborů v Brně, 2007. 218 pp. ISBN 978-80-7013-450-4.



Intracytoplasmic sperm injection