PROCEDURE

In vitro fertilization

In vitro fertilization is a fertility treatment in which eggs are collected, fertilized in a laboratory, and transferred to the uterus.

PURPOSE
To create a pregnancy using laboratory-fertilized eggs

PROCEDURE TYPE
Therapeutic; minimally invasive retrieval and outpatient embryo transfer

WHERE IT IS DONE
Outpatient fertility clinic or procedure suite

ANAESTHESIA
Sedation for egg retrieval; usually none for embryo transfer

HOW LONG IT TAKES
About two to three weeks per treatment cycle

PREPARATION
Medication schedule, monitoring, fasting before retrieval, arranged transport

RECOVERY
Same day; no driving after sedation

MAIN RISKS
Ovarian hyperstimulation, bleeding, infection, ectopic or multiple pregnancy

RESULTS
Pregnancy test about 9 to 14 days after transfer

Overview

In vitro fertilization, usually called IVF, is a series of treatments rather than one procedure. Eggs are collected from the ovaries and combined with sperm in a laboratory. One or more resulting embryos may then be placed into the uterus.

A typical IVF cycle includes hormone injections, blood tests and ultrasound scans, egg retrieval, fertilization, embryo growth and embryo transfer. Embryos may be transferred during the same cycle or frozen for later use.

IVF does not guarantee pregnancy. The chance of success is influenced by factors such as age, egg and sperm health, the reason for treatment, embryo development and previous pregnancies.

Why the procedure is performed

IVF may be offered when pregnancy has not occurred through sex, fertility medicines or other treatments. It may be considered sooner when another approach is unlikely to work.

Reasons for using IVF include:

IVF can also be used with a gestational carrier, who carries a pregnancy created using an embryo.

- Blocked, damaged or absent fallopian tubes
- Sperm that are low in number or movement
- Ovulation problems that have not responded to simpler treatment
- Endometriosis, in which tissue similar to the uterine lining grows elsewhere
- Infertility without a clear cause
- Use of donated eggs, sperm or embryos
- Fertility preservation before treatment that may damage eggs or sperm
- Testing embryos for a specific inherited condition

Who should and should not have it

IVF may be suitable if testing suggests it offers a reasonable route to pregnancy and you understand its physical, emotional and financial demands. Your care team should discuss your expected chance of success based on your circumstances rather than clinic-wide averages alone.

Treatment may be delayed if you have an active pelvic infection, an uncontrolled medical condition or a condition that would make pregnancy unsafe at that time. A problem inside the uterus, such as some fibroids or polyps, may need assessment or treatment before embryo transfer.

A low egg count or reduced ovarian reserve does not automatically rule out IVF, but it may reduce the number of eggs collected and the chance of success. Donor eggs may be an option for some people.

IVF may not be the right choice if treatment burdens outweigh the likely benefit, if egg retrieval or pregnancy would present unacceptable medical risk, or if you do not wish to use assisted reproduction. You can ask for time, counselling or another opinion before consenting.

How to prepare

Your treating facility's own instructions take priority because medication plans and anaesthesia arrangements differ between clinics.

Tell the clinic about all medicines, vitamins and supplements you use. This includes aspirin, blood thinners and non-prescription products. Do not stop a prescribed medicine unless the clinician responsible for it tells you to.

You will receive a schedule for hormone injections and monitoring appointments. Timing matters, especially for the final "trigger" injection that prepares the eggs for collection. Contact the clinic promptly if a dose is late, missed or taken incorrectly.

Before egg retrieval, follow the clinic's fasting instructions. Arrange for an adult to take you home because sedatives can affect judgment and coordination. Ask whether someone should stay with you afterward.

The clinic will also explain how a sperm sample will be provided or thawed, if applicable. Written consent usually covers egg collection, fertilization methods, embryo transfer, genetic testing and storage or disposal of unused embryos.

What happens during the procedure

Hormone medicines first encourage several ovarian follicles to grow. Follicles are fluid-filled sacs that may contain eggs. Ultrasound scans and blood tests help the clinic monitor your response and choose the timing of egg retrieval.

For retrieval, you receive pain relief and usually moderate or deep sedation. An ultrasound probe is placed in the vagina. A thin needle passes through the vaginal wall into each ovary, and fluid containing the eggs is gently removed. The collection commonly takes less than 30 minutes.

In the laboratory, eggs are combined with sperm. If needed, a single sperm may be injected into an egg. This is called intracytoplasmic sperm injection, or ICSI. Fertilized eggs are observed as they develop into embryos over several days.

For embryo transfer, a thin flexible tube passes through the cervix into the uterus. The embryo is released through the tube. Ultrasound may be used to guide placement. Transfer is usually brief and does not require anaesthesia.

Suitable embryos that are not transferred may be frozen. If genetic testing is planned, cells are removed from an embryo for testing, and the embryo is usually frozen while results are pending.

Recovery and what to expect afterward

Mild lower abdominal pain, bloating and light vaginal spotting can occur after egg retrieval. Pain should generally improve rather than become more intense. Use only pain medicine approved by your clinic.

You can usually eat and drink once you are awake, unless your team gives different instructions. Nausea from sedation may temporarily limit what feels comfortable.

Take it easy for the rest of retrieval day. Your clinic may advise avoiding strenuous exercise or sex for a short period because the ovaries remain enlarged. Prolonged bed rest after embryo transfer is generally not needed.

Do not drive, operate machinery, drink alcohol or make important decisions for the period specified by the sedation team, often until the following day. You must have someone take you home after retrieval.

Many people return to desk-based work the next day. More time may be needed if your work is physically demanding or you have significant discomfort.

Risks and possible complications

Fertility medicines can cause headaches, mood changes, breast tenderness, bloating or bruising at injection sites.

Ovarian hyperstimulation syndrome, or OHSS, happens when the ovaries respond too strongly to medication. It can cause increasing abdominal swelling, pain, nausea and fluid shifts. Severe cases can affect breathing, kidney function or blood clot risk.

Egg retrieval can cause bleeding, infection or injury to nearby organs, although these are uncommon. Sedation also has risks, including breathing problems or reactions to medicines.

More than one embryo can implant, leading to twins or a higher-order multiple pregnancy. Multiple pregnancy increases health risks for both the pregnant person and babies. Transferring fewer embryos reduces this risk but may affect decisions about the chance of pregnancy in that transfer.

IVF pregnancies can be ectopic, meaning implantation occurs outside the uterus. A treatment cycle may also be cancelled if too few or too many follicles develop, no eggs are collected, fertilization does not occur or no suitable embryo develops.

Results and follow up

The laboratory usually reports how many eggs were collected and how many fertilized. Further updates describe embryo development and whether any embryos are suitable for transfer, testing or freezing.

Your clinic will schedule a blood pregnancy test, often about 9 to 14 days after transfer. Testing at home too early can give a misleading result, especially if the trigger medicine contained the pregnancy hormone hCG.

If the test is positive, repeat blood tests or an ultrasound may be arranged to confirm that the pregnancy is developing inside the uterus. Continue progesterone or other prescribed medicines until the clinic tells you to stop.

If the test is negative, the clinic should explain what happened during the cycle and discuss whether another attempt, a changed plan or a different option is reasonable.

Alternatives

The realistic alternatives depend on why IVF was offered. Each option has different burdens and chances of success.

For an inherited condition, prenatal testing during pregnancy may be an alternative to embryo testing. It provides information later and may lead to different decisions.

- Trying without treatment: Avoids procedures and medicines but may have a low chance of success when tubes are blocked or sperm problems are severe.
- Ovulation medicines with timed sex: Less invasive and less expensive, but useful mainly when ovulation is the main problem.
- Intrauterine insemination: Places prepared sperm in the uterus. It is simpler than IVF but offers less control over fertilization and embryo development.
- Tubal or other reproductive surgery: May correct a specific physical problem, but involves surgery and may not restore fertility.
- Donor eggs, sperm or embryos: Can overcome some egg or sperm problems but changes the child's genetic relationship to one or both intended parents.
- Gestational carrier: Allows pregnancy when carrying would be unsafe or impossible, but involves complex medical, legal and financial arrangements.
- Adoption or choosing not to pursue treatment: Avoids fertility procedures but does not provide a pregnancy using your eggs or sperm.

When to call your healthcare team

Mild cramping, bloating and light spotting can usually be discussed at routine follow-up if they are improving.

Contact your fertility team promptly if you have worsening abdominal pain, repeated vomiting, increasing abdominal swelling, reduced urination, fever, foul-smelling discharge or trouble keeping fluids down. Also call about heavy bleeding or pain that is not controlled by the medicines they recommended.

Seek emergency care for severe breathing difficulty, chest pain, fainting, sudden severe abdominal pain or heavy bleeding with weakness or dizziness. After a positive pregnancy test, severe one-sided pelvic pain, shoulder-tip pain or faintness needs urgent assessment because these can occur with an ectopic pregnancy.

Common questions

Will I be asleep for IVF?

You are usually sedated for egg retrieval, so you may sleep or remember little. Embryo transfer is normally done while you are awake and usually needs no anaesthesia.

Can I drive home after egg retrieval?

No. Sedation affects coordination and judgment. Arrange for an adult to take you home and follow the clinic's driving restriction.

How painful is IVF?

Hormone injections may sting, and growing ovaries can cause pressure or bloating. Retrieval is performed with sedation and pain relief. Transfer often feels similar to a cervical screening test, with brief cramping or pressure.

When will I know if it worked?

Your clinic usually performs a blood pregnancy test about 9 to 14 days after embryo transfer. An ultrasound later confirms the pregnancy's location and early development.

How many embryos will be transferred?

This is decided with you based on factors such as age, embryo quality, previous treatment and the risk of multiple pregnancy. Extra suitable embryos may be frozen.

What happens to unused embryos?

Depending on your consent and local law, embryos may remain frozen, be donated where

permitted, used in approved research or allowed to perish. The clinic should explain the choices, storage costs and consent rules before treatment.

Sources

- Human Fertilisation and Embryology Authority: In vitro fertilisation
- National Health Service: IVF
- National Institute for Health and Care Excellence: Fertility problems-assessment and treatment, guideline CG156
- Centers for Disease Control and Prevention: About assisted reproductive technology
- Royal College of Obstetricians and Gynaecologists: Ovarian hyperstimulation syndrome
- Practice Committee of the American Society for Reproductive Medicine. "Guidance on the limits to the number of embryos to transfer: a committee opinion." Fertility and Sterility . 2021;116(3):651-654.