

IN VITRO FERTILIZATION



INFORMATION FOR PATIENTS PREPARING FOR IVF

Welcome to Sheba Medical Center, the largest hospital in Israel and in the region, which provides patients with access to world-class medicine with a personal touch. Sheba's medical and nursing personnel work in accordance with the highest professional standards, treating patients courteously and respecting their rights, including the right to receive complete and reliable information about diagnostics, treatment, prospect of recovery, risks and side effects.

DESCRIPTION

IVF is a process of fertilization where an egg is combined with sperm outside the body. The recommended age to undergo an IVF procedure for women is under 45.

IVF is performed to treat infertility that may be caused by different conditions.

INDICATIONS

- Fallopian tube damage or obstruction
- Ovulation disorders
- Impaired sperm production or function
- A genetic disorder
- Unexplained infertility and other

HOW IS THE PROCEDURE PERFORMED?

- It takes around 2 weeks to prepare for the IVF procedure. The pre-procedure preparation includes testing for both partners. Women undergo a gynecological examination, vaginal ultrasound, screening for HIV, hepatitis, syphilis, hormone level tests, PAP smear, etc. Men must also undergo the blood tests as well as a spermogram.
- Once these tests are completed, a medical professional will be able to accurately identify the cause for the infertility and, accordingly, the most suitable IVF method.
- The IVF procedure normally starts with ovarian stimulation. To stimulate the ovaries, the woman takes injectable medication containing specific hormones. These medications cause more than one egg to develop within a single cycle. This stage usually lasts for 2 weeks.
- When ovulation occurs, the eggs are retrieved using the transvaginal ultrasound-guided aspiration retrieval technique. This process is monitored using ultrasound imaging.
- After the retrieval procedure, the eggs are combined with the partner or donor's sperm. Before fertilization, the sperm are separated from the seminal fluid in the lab. Testicular aspiration to extract sperm directly from the testicle may be required in some cases.
- The egg is combined with sperm in a Petri dish so that they will fertilize. Fertilization may occur in the conventional manner or through ICSI (Intracytoplasmic Sperm Injection). With either conventional IVF or ICSI, once fertilization occurs, the fertilized egg is then transferred to the incubator. If fertilization is successful, the embryo is tested for viability and any pathologies.
- The selected embryo is then transferred into the uterine cavity through the cervix using a catheter. Transferring multiple embryos is possible as well, but in most cases modern clinics practice transferring one embryo and freezing the rest to use in case of an unsuccessful IVF.
- What to expect after the procedure? After the implantation procedure, women some times may be assigned further hormone therapy in order to support the pregnancy and minimize the risks for miscarriage. IVF pregnancy is no different from a regular pregnancy. The same goes for delivery.



PROBABILITY OF SUCCESS

The probability of success with IVF treatments depends on a number of factors, such as the age of both partners, the quality of the woman's eggs, the presence of any uterine, fallopian tube, ovarian or pelvic pathologies, sperm quality, etc. It is impossible to predict the chances of pregnancy for an individual couple, so any numbers provided are just estimates.

It is also impossible to guarantee successful egg fertilization and consequent childbirth. Overall, the chances of pregnancy after undergoing one IVF treatment cycle are about 30%.

Hormone therapy:

There is a relation between the number of transferred embryos and the probability of success. Thus, one of the main objectives of the treatment is to develop as many eggs as possible.

With the natural cycle, only one egg is developed every month. Hormone therapy stimulates the ovaries to produce multiple eggs. This makes it possible to transfer more embryos. Medication is used to balance various hormones and suppresses the activity of the hypothalamic-gonadal axis, thus increasing treatment efficacy.

Hormone therapy may lead to ovarian hyperstimulation syndrome.

In most cases, it is a mild form of hyperstimulation. Signs and symptoms typically include bloating and abdominal pain, enlarged ovaries and fluid accumulation in the abdominal area. These symptoms typically last for 3-4 weeks after egg retrieval. If pregnancy occurs, however, they might last longer. In most cases, it can be managed with decreased activity and hydration. Hospitalization is not required.

Rarely, a more severe form of ovarian hyperstimulation syndrome may occur.

If treatment includes pre-procedure suppression of ovarian activity, climax-like side effects might occur. Ovarian cysts are also possible. This might require either a cyst aspiration procedure or termination of treatment.



PROCESS

HORMONE THERAPY:

The egg development process is monitored by taking hormonal blood tests and/or a transvaginal ultrasound screening.

EGG RETRIEVAL AND FERTILIZATION:

During egg retrieval, the woman is sedated and given pain medication. Transvaginal ultrasound aspiration is the usual retrieval method. The woman will experience discomfort after the procedure, so she must rest for a couple of hours. The main complications, namely infection and bleeding, can occur as a result of the needle being inserted into the ovary. Almost every insertion causes mild bleeding.

Fertilization happens as a result of egg incubation with sperm in a laboratory environment.

Micromanipulation

Micromanipulation refers to procedures that are performed in the laboratory for the following reasons:

- 1.** ICSI: This procedure is performed in case of low-quality sperm that does not allow for natural fertilization to occur, usually after several unsuccessful IVF treatment cycles. Intracytoplasmic Sperm Injection (ICSI) involves the direct injection of sperm into eggs using a very fine needle.
- 2.** Assisted hatching or AZH (Assisted Zona Hatching) refers to weakening the embryo's outer layer in order to assist the implantation process. This is a technique in which the zona pellucida is thinned or ruptured via mechanical, chemical or laser processing.

INCUBATION:

Over the 1-3 days following the retrieval procedure, the eggs and, later, the embryos are stored in the lab incubator in order to ensure optimal conditions for their development.

EMBRYO TRANSFER

There are a few different options available for embryo transfer

Embryo Transfer Into The Uterus

2-3 days after fertilization, the embryos are loaded into a fine transfer catheter that passethrough the vagina and cervix into the uterus. This procedure typically doesn't require anesthesia. Embryo transfer is a relatively easy procedure. Sometimes, however, due to a narrow cervical opening, the widening procedure during the transfer can be slightly painful.

Tubal Transfer

The preliminary condition required for this procedure is fallopian tubes in a normal condition, therefore this procedure is only possible when there are no mechanical infertility factors.

During the first 3-4 days, natural fertilization and embryo development occur in the fallopian tubes. There are greater chances of success when using the tubal transfer method because the eggs and sperm, or fertilized eggs, are transferred into their natural environment. This procedure is sometimes performed under anesthesia.

Transfer

1. Eggs and sperm are transferred on the day of retrieval. This procedure is called GIFT (Gamete Intrafallopian Transfer).
2. Fertilized eggs are transferred the day after retrieval. At this stage, the fertilized egg is called a zygote, and the described technique is known as ZIFT (Zygote Intrafallopian Transfer).
3. Fertilized eggs in later stages of embryo development. This procedure is called TET (Tubal Embryo Transfer). Embryos can be transferred into the fallopian tube opening in the abdomen via laparoscopy, or they can be transferred into the proximal tubal opening through the cervix via TCTET (Transcervical Tubal Embryo Transfer).

During the laparoscopy procedure for embryo transfer into the fallopian tube (GIFT, ZIFT), an illuminated viewing instrument is inserted into the lower abdomen through a small incision, so that the internal organs are visible and surgical actions can be performed.

Laparoscopy is usually done under general anesthesia.

Because of abdominal insufflation during the procedure, you can expect to experience pain in the abdomen and shoulders for a couple of hours



What to expect after the procedure

Multiple pregnancy: IVF increases the risk of multiple pregnancy by up to 30%. If this occurs, a fetal reduction procedure can be offered. Possible complications of such a procedure include immediate or consequent miscarriage and pelvic inflammation resulting in premature birth. Multiple pregnancy is correlated with the birth of preterm infants. Multiple pregnancy more often leads to Cesarean section.



Embryos are frozen if there are any viable embryos remaining after the transfer procedure. Frozen embryos can be used, with consent, for possible future IVF cycles, surrogacy or if the implantation procedure needs to be postponed due to the woman's medical condition. The embryos are frozen in a digital freezer at temperatures of -196°C and are stored in test tubes or specially-designed straws. According to a resolution passed by Israel's Ministry of Health, embryos can be stored for up to 5 years. After this period, spouses are supposed to inform the clinic if they want to store the embryos for a period longer than 5 years. Embryos will be stored only if a written request signed by the woman who gave the eggs and her husband is submitted.