



# N o v a I n V i t r o F e r t i l i z a t i o n

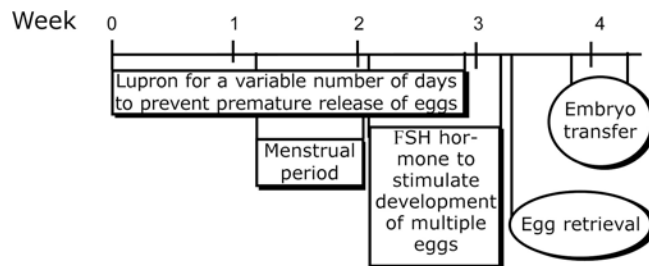
## Treatment Protocol In Vitro Fertilization

*In vitro* fertilization (IVF) is one of the most effective treatments available to help infertile couples achieve pregnancy. Most couples will have a 25% to 50% probability of a live birth per IVF procedure. In addition to being a very powerful treatment for infertility, IVF is an excellent test of egg and sperm quality.

*In vitro* fertilization treatment consists of:

1. Ovarian stimulation to induce growth of multiple eggs within the ovaries.
2. Ultrasound guided egg retrieval.
3. Fertilization of the eggs.
4. Transfer of the resulting embryos into the uterus.
5. Establishment of pregnancy.

This is an example of an IVF treatment sequence. Actual treatment is individualized.



### 1. Ovarian stimulation

IVF treatment begins with the onset of a menstrual period. Oral contraceptives are started within the first seven days of the menstrual cycle. They prime the ovaries for an optimal response. One week before the estimated onset of the next menstrual period, leuprolide (Lupron) injections begin. Leuprolide prevents premature release of the eggs from the ovaries prior to the egg retrieval procedure. The volume of the leuprolide injection is very small and it is given subcutaneously (just under the skin). They are given for approximately three to four weeks.

After one to two weeks of taking leuprolide, a menstrual period will start. Within two weeks of the onset of the period, follicle stimulating hormone (FSH) injections are added to the leuprolide. FSH stimulates maturation of multiple eggs within the ovaries. FSH injections, like leuprolide, are given subcutaneously with tiny needles. FSH injections are taken daily for approximately ten days.

During this time the progress is monitored by ultrasound and estrogen blood levels. Once the eggs are ready, the leuprolide and FSH are stopped and a single injection of human chorionic gonadotropin (HCG) hormone is taken. This is also a subcutaneous injection. This medication triggers the final stages of egg maturation. Thirty-six hours after the HCG injection, the eggs are nonsurgically retrieved from the ovaries.

### 2. Ultrasound guided egg retrieval

Using ultrasound guidance, a tip of a thin needle is passed through the top of the vagina into the cul-de-sac (a space behind the uterus). The ovaries are located near the bottom of the cul-de-sac allowing the tip of the aspirating needle to enter the ovarian follicles and aspirate the follicular fluid from them. The fluid is examined under a microscope to identify the eggs. The egg retrieval takes approximately five to ten minutes. Medications are used for pain relief. Many women do not feel the eggs being aspirated. It is possible to have a short lasting menstrual-like cramp sensation when the tip of the needle passes through the top of the vagina (once for each ovary). The actual follicle aspiration is typically not felt by the patient. The egg retrieval is a very safe procedure.

### 3. IVF laboratory

On average, eight to fourteen eggs are aspirated during the egg retrieval procedure. The eggs are identified under the microscope and are placed in culture medium filled petri dishes. The composition of the medium resembles the fluid secreted by the Fallopian tubes. This allows the eggs and embryos (fertilized eggs) to develop in the laboratory environment at the same rate as inside the Fallopian tubes.

The male partner collects a semen specimen by masturbation the day of the egg retrieval. The highest quality sperm are extracted from the semen and are combined with the eggs six hours after the egg retrieval. The process of fertilization takes place over a period of several hours during the night.

If the fertility history suggests a possibility of male infertility significant enough to keep the eggs from being fertilized this way, intracytoplasmic sperm injection (ICSI) is performed. In ICSI a single sperm is inserted into an egg. This can significantly increase the fertilization rate for selected couples.

Evidence of fertilization can be seen the next day, 14 to 16 hours after insemination. The fertilized eggs are transferred into growth medium and continue to be cultured in the IVF laboratory.

### 4. Embryo transfer

The embryo transfer is done one to five days after the egg retrieval. The embryo(s) is/are "loaded" into the tip of a very thin embryo transfer catheter in a very small volume of transfer medium. The catheter is then passed through the cervical canal to within 5 mm of the top of the uterus and the embryo(s) are gently released. The transfer usually takes only a few seconds to complete. No resting is required afterwards.

The gamete embryologists assess the embryos prior to the embryo transfer to determine their likelihood of implantation. Most partners usually select two to four embryos for the transfer. Approximately one-third to one-half of IVF pregnancies are twins and there are very few triplet or higher order pregnancies.

There may be more embryos than the couple wish to have transferred. It is possible to cryopreserve these embryos and store them in liquid nitrogen. Approximately one-half to three-quarters of the embryos survive the cryopreservation and thawing process. The implantation rate of the surviving embryos can be somewhat lower than with the "fresh" embryos.

### 5. Establishment of pregnancy

After the embryo transfer, the front and back walls of the uterus gently hold the embryos, keeping them within the uterus. There is no restriction of physical or sexual activity.

The lining of the uterus is made receptive for the embryos through the action of the hormones estrogen and progesterone produced by the ovaries. Ovarian progesterone production is supplemented with vaginal progesterone capsules or cream.

A blood pregnancy test is done approximately two weeks after the embryo transfer. If the pregnancy test is positive, an ultrasound examination is scheduled two weeks later to visualize the implantation site and to look for a heartbeat. Once a heartbeat is seen, there is a 90% to 95% probability that the pregnancy will continue to a live birth. From that point on, the pregnancy becomes indistinguishable from a pregnancy conceived through intercourse.

At Nova IVF, it is our goal to minimize the likelihood of a high order multiple pregnancy (triplets or higher). If you conceived with a high order multiple pregnancy and by the 10th week a spontaneous reduction has not taken place, you may choose to have a selective reduction. This procedure would be performed by a specialist. The reduction carries with it 5-10% risk of losing the whole pregnancy.

If the pregnancy test is negative, your period would start within a few days. You could begin another IVF treatment cycle or, if you have cryopreserved embryos, you might decide to have them transferred. Either treatment could begin after one spontaneous menstrual cycle. This would give your ovaries time to rest after the stimulation.

The following graph shows how the cumulative probability of pregnancy adds up if a couple is going through one to four cycles of IVF. In this example, we used an arbitrary 35% live birth probability per treatment. Your actual likelihood of a live birth could be higher or lower.

