

# COMMON CAUSES OF INFERTILITY & IVF

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# DEFINITION

- Infertility is “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.”...  
(WHO-ICMART glossary<sup>1</sup>)



# INFERTILITY

- **Primary infertility:** The inability of a woman to conceive after one year of unprotected intercourse
- **Secondary infertility:** The inability of a woman to conceive who previously was able to do so.



- Causes of infertility can be in male or female



# CAUSES OF MALE INFERTILITY

## **1. Abnormal sperm production or function due to**

- undescended testicles,
- genetic defects,
- health problems such as diabetes, or
- infections such as chlamydia, gonorrhea, mumps or HIV.
- Enlarged veins in the testes (varicocele) also can affect the quality of sperm.



## **2.Problems with the delivery of sperm due to sexual problems, such as**

- premature ejaculation;
- certain genetic diseases, such as cystic fibrosis;
- structural problems, such as a blockage in the testicle; or damage or injury to the reproductive organs.



- 3.Overexposure to certain environmental factors,** such as pesticides and other chemicals, and radiation.
- Cigarette smoking, alcohol, anabolic steroids, and
  - taking medications to treat bacterial infections, high blood pressure and depression also can affect fertility.
  - Frequent exposure to heat, such as in hot tubs, can raise body temperature and may affect sperm production



**4.Damage related to cancer and its treatment,**  
including radiation or chemotherapy. Treatment for cancer  
can impair sperm production, sometimes severely.



# CAUSES OF FEMALE INFERTILITY

**1.Ovulation disorders**, which affect the release of eggs from the ovaries.

- These include hormonal disorders such as polycystic ovary syndrome(PCOS)
- Hyperprolactinemia, a condition in which you have too much prolactin — the hormone that stimulates breast milk production — also may interfere with ovulation.
- Either too much thyroid hormone (hyperthyroidism) or too little (hypothyroidism) can affect the menstrual cycle or cause infertility.
- Other underlying causes may include too much exercise, eating disorders or tumors



## **2.Uterine or cervical abnormalities,**

- including abnormalities with the cervix, polyps in the uterus or the shape of the uterus.
- Noncancerous (benign) tumors in the uterine wall (uterine fibroids) may cause infertility by blocking the fallopian tubes or stopping a fertilized egg from implanting in the uterus



### **3. Fallopian tube damage or blockage,**

-often caused by inflammation of the fallopian tube (**salpingitis**). This can result from pelvic inflammatory disease, which is usually caused by a sexually transmitted infection, endometriosis or adhesions.



**4. Endometriosis**, which occurs when endometrial tissue grows outside of the uterus, may affect the function of the ovaries, uterus and fallopian tubes.



**5.Primary ovarian insufficiency (early menopause)**, when the ovaries stop working and menstruation ends before age 40.

Although the cause is often unknown, certain factors are associated with early menopause,

- including immune system diseases, certain genetic conditions such as Turner syndrome or , and radiation or chemotherapy treatment.



**6. Pelvic adhesions,** bands of scar tissue that bind organs that can form after pelvic infection, appendicitis, endometriosis or abdominal or pelvic surgery.

**7. Cancer and its treatment.** Certain cancers — particularly reproductive cancers — often impair female fertility. Both radiation and chemotherapy may affect fertility.



# ASSISTED REPRODUCTIVE TECHNOLOGY (ART)

- ▣ **IUI** - Intrauterine insemination
- ▣ **IVF-ET** - In vitro fertilization and embryo transfer
- ▣ **GIFT** - Gamete intra-fallopian transfer
- ▣ **ICSI** - Intra-cytoplasmic sperm injection



# METHODS OF SPERM RETRIVAL

- **TESE** - Testicular sperm extraction
- **MESA** - Micro surgical epididymal sperm aspiration
- **PESA** - Percutaneous epididymal sperm aspiration



# IN VITRO FERTILISATION(IVF)



# IN VITRO FERTILISATION (IVF)

- In vitro fertilization (IVF) is a treatment for infertility.
- In vitro fertilisation (**IVF**) is a process of fertilisation where an egg is combined with sperm outside the body, in vitro ("in glass")
- IVF is offered as a primary treatment for infertility in women over age 40. IVF can also be done if you have certain health conditions
- (causes explained previously)



# STEPS IN IVF

1. Consultation with infertility specialist
2. Blood tests & scans are done in female to assay hormonal levels & reproductive structures
3. Semen analysis is done in males
4. Ovarian stimulation
5. Monitoring by serial USG
6. Trigger
7. Retrieval of eggs
8. Collection of good quality sperms
9. In vitro Fertilization
10. Embryo transfer
11. Pregnancy test



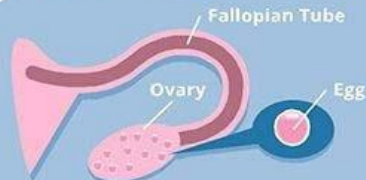
# How does IVF Work?

## 1 Consultation



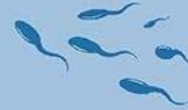
Before your treatment starts, you will discuss everything with your doctor

## 2 Blood tests and scans



We need to look at your hormone levels and your ovarian follicles to decide a treatment plan that is right for you. Other investigations such as 3D SIS, 3D hycosy and endometrial biopsy may also be done

## 3 Semen analysis



IVF requires good quality sperm. The analysis looks at sperm morphology (shape) and motility (movement) as well as quantity

## 4 Stimulation



Injections will stimulate your body to develop multiple eggs

## 5 Monitoring



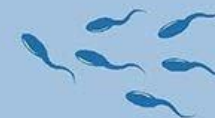
Scans and blood tests allow us to keep a close eye on your body's reaction to the drugs

## 6 Trigger injection



When hormones are at the right levels, another injection will trigger the follicles to release eggs

## 7 Egg collection and sperm collection



Eggs are collected via a needle passed through the vagina whilst you are under sedation. Sperm is collected manually or surgically

## 8 Fertilisation and embryo development



Eggs and sperm are placed in a petri dish in an incubator to fertilise. Embryologists keep a close eye on the embryos as they continue to develop

## 9 Embryo transfer

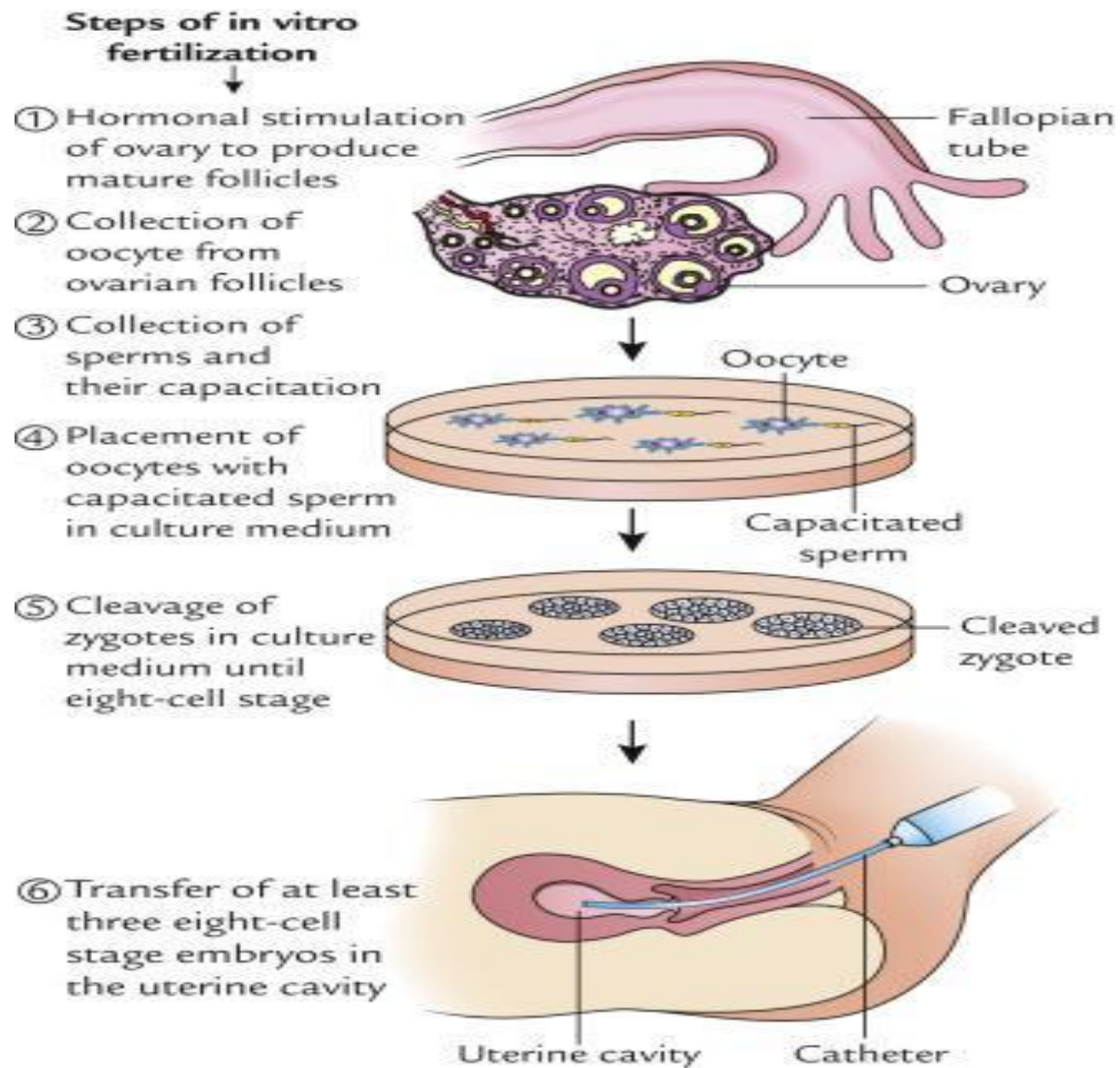


The best embryo(s) is/are transferred back into the uterus. Any viable embryos not transferred will be frozen for later use

## 10 Pregnancy test



Patients take a pregnancy test 16 days after embryo transfer. Whatever the outcome, CRGH will arrange further appointments and support for patients at this stage

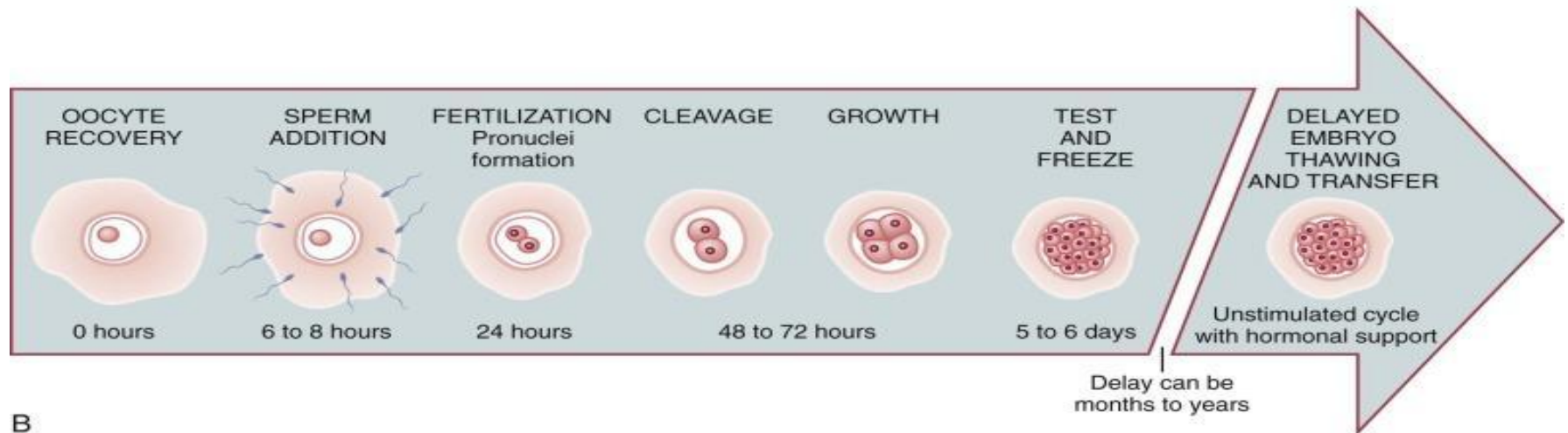
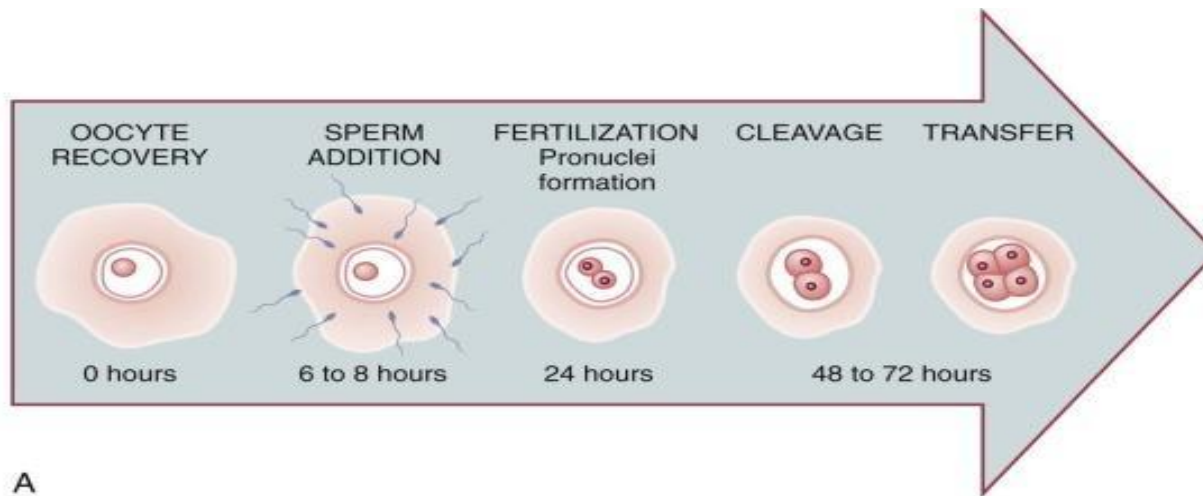


Fertilization and formation of germ layers

Singh, Vishram, MBBS, MS, PHD(hc), MICPS, FASI, FIMSA, Textbook of Clinical Embryology, 4, 37-49

Various steps of in vitro fertilization and embryo transfer.

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Infertility and Assisted Reproductive Technologies

Gambone, Joseph C., Hacker & Moore's Essentials of Obstetrics and Gynecology, Chapter 34, 395-405

Approximate time-course for in vitro fertilization and embryo transfer in same cycle as stimulation (A) or delayed after embryo freezing and thawing (B).

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# RISKS

- ❑ **Multiple births.** IVF increases the risk of multiple births if more than one embryo is transferred to your uterus.
- ❑ **Premature delivery and low birth weight.** Research suggests that IVF slightly increases the risk that the baby will be born early or with a low birth weight.



- ❑ **Ovarian hyperstimulation syndrome.** Use of injectable fertility drugs, such as human chorionic gonadotropin (HCG), to induce ovulation can cause ovarian hyperstimulation syndrome, in which your ovaries become swollen and painful.
- ❑ Symptoms typically last a week and include mild abdominal pain, bloating, nausea, vomiting and diarrhea. If you become pregnant, however, your symptoms might last several weeks. Rarely, it's possible to develop a more severe form of ovarian hyperstimulation syndrome that can also cause rapid weight gain and shortness of breath.



- ❑ **Miscarriage.** The rate of miscarriage for women who conceive using IVF with fresh embryos is similar to that of women who conceive naturally — about 15% to 25% — but the rate increases with maternal age.
- ❑ **Egg-retrieval procedure complications.** Use of an aspirating needle to collect eggs could possibly cause bleeding, infection or damage to the bowel, bladder or a blood vessel. Risks are also associated with sedation and general anesthesia, if used.
- ❑ **Ectopic pregnancy.** About 2% to 5% of women who use IVF will have an ectopic pregnancy — when the fertilized egg implants outside the uterus(fallopian tube)



- **Stress.** Use of IVF can be financially, physically and emotionally draining. Support from counselors, family and friends can help the partners through the ups and downs of infertility treatment.



- <https://www.youtube.com/watch?v=uXsCngh89fI>



□ THANKYOU

