Infertility

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Infertility is a serious medical concern that affects quality of life and is a problem for 10% to 15% of reproductive age couples.

The term **infertility** implies subfertility, a prolonged time to conceive, as opposed to sterility, which means the inability to conceive.

Normally a fertile couple has approximately a 20% chance of conception in each ovulatory cycle.

Primary infertility applies to a woman who has never been pregnant.

Secondary infertility applies to a woman who has been pregnant in the past.

The prevalence of infertility is relatively stable among the overall population but increases with the age of the woman, particularly in those older than 40 years.

Probable causes include the trend toward delaying pregnancy until later in life, when fertility decreases naturally and the prevalence of diseases such as endometriosis and ovulatory dysfunction increases.

Factors associated with infertility

Many factors, in both men and women, contribute to normal fertility. A normally developed reproductive tract in both the male and female partner is essential. Normal functioning of an intact hypothalamic – pituitary – gonadal axis supports gametogenesis - the formation of sperm and ova.

Although sperm cells remain viable in the female's reproductive tract for 48 hours or more, probably only a few retain fertilization potential for more than 24 hours.

Ova remain viable for approximately 24 hours, but the optimal time for fertilization may be no more than 1 to 2 hours; thus the timing of intercourse become critical. After fertilization the conceptus must travel down the patent uterine tube to the uterus and implant within 7 to 10 days in a hormone- prepared endometrium. An alteration in one or more of these structures, functions, or processes results in some degree of impaired fertility.

In general, approximately 20% of couples will have unexplained or idiopathic causes of infertility. Among the 80% of couples who have an identifiable cause of infertility, approx. 40% to 55% are related to factors in the female partner, and 30% to 40% are related to factors in the male partner, and 15% to 20% are related to unexplained or unusual factors.

Factors Affecting Female Fertility

OVARIAN FACTORS

- Developmental anomalies
- Anovulation, primary
  - Pituitary or hypothalamic hormone disorder
  - Adrenal gland disorder
  - Congenital adrenal hyperplasia
- Anovulation, secondary
  - Disruption of hypothalamic-pituitary-ovarian axis
  - Amenorrhea after discontinuing oral contraceptive pills
  - Premature ovarian failure
  - Increased prolactin levels

UTERINE, TUBAL, AND PERITONEAL FACTORS

- Developmental anomalies
- Tubal motility reduced
- Inflammation within the tube
- Tubal adhesions
- Endometrial and myometrial tumors
- Asherman syndrome (uterine adhesions or scar tissue)
- Endometriosis
- Chronic cervicitis
- Hostile or inadequate cervical mucus

OTHER FACTORS

- Nutritional deficiencies (e.g., anemia)
- Thyroid dysfunction
- Idiopathic condition

Factors Affecting Male Fertility

STRUCTURAL OR HORMONAL DISORDERS

- Undescended testes
- Hypospadias
- Varicocele
- Obstructive lesions of the vas deferens or epididymis
- Low testosterone levels
- Hypopituitarism
- Endocrine disorders
- Testicular damage caused by mumps
- Retrograde ejaculation

OTHER FACTORS

- Sexually transmitted infections
- Exposure to workplace hazards such as radiation or toxic substances
- Exposure of scrotum to high temperatures
- Nutritional deficiencies
- Antisperm antibodies
- Substance abuse
  - Changes in sperm—cigarette smoking, heroin, marijuana, amyl nitrate, butyl nitrate, ethyl chloride, methaqualone
  - Decrease in libido—heroin, methadone, selective serotonin reuptake inhibitors, and barbiturates
  - Impotence—alcohol, antihypertensive medications
- Idiopathic condition

Diagnosis

The basic infertility survey of the woman involve evaluation of the cervix, uterus, tubes, and peritoneum and documentation of ovulation. Diagnostic tests include serum progesterone concentration, urinary LH excretion, hysterosalpingography, transvaginal ultrasound examination, endometrial biopsy, and laparoscopy.

The basic test for male infertility is the **semen analysis**

A complete semen analysis, study of the effects of cervical mucus on sperm for motility and survival, and evaluation of the sperm's ability to penetrate an ovum provide basic information. Semen is collected by ejaculation into a clean container or a plastic sheath that does not contain a spermicidal agent. The specimen is usually collected by masturbation after 2 to 5 days of abstinence from ejaculation. The semen is taken to the laboratory in a sealed container within 2 hours of ejaculation. Avoid exposure to excessive heat or cold.

If results are in the fertile range, no further sperm evaluation is necessary. If not within this range, the test is repeated. If results are still in the subfertile range, further evaluation is needed to identify the problem. Other tests are performed as needed and include hormone analyses for testosterone, gonadotropin, FSH, and LH, the sperm penetration assay to evaluate the ability of sperm to penetrate an egg, and testicular biopsy.

Semen Analysis

- Liquefaction usually complete within 10 to 20 min
- Semen volume 2 ml to 6 ml
- Semen pH 7.2 to 8.0
- Sperm density 20 million to 200 million per milliliter
- Total sperm count 40 million per milliliter
- Normal morphology 30% (normal oval)
- Motility (important consideration in sperm evaluation)—percentage of forward-moving sperm estimated with respect to abnormally motile and nonmotile sperm, 50%
- White cell count 1 million per milliliter
- Ovum penetration test (may be done if further evaluation necessary)

Interventions

The management of patients with infertility problems includes psychosocial, nonmedical, medical, and surgical interventions.

1. Psychosocial

Feelings connected to impaired fertility are numerous and complex. The origins of some of these feelings are myths, superstitions, and misinformation about the causes of infertility. Other feelings arise from the need to undergo many tests and examinations and from being different from others.

2- Nonmedical

Simple changes in lifestyle may be effective in the treatment of subfertile men. Couples should use only water – soluble lubricants during intercourse because many commonly used lubricants contain spermicides or have spermicidal properties. Daily hot tub bathing or saunas can keep the testes at temperatures too high for efficient spermatogenesis.

Treatment is available for women who have immunologic reactions to sperm. The use of condoms during genital intercourse for 6 to 12 months will reduce female antibody production in most women who have elevated antisperm antibody titers. After the serum reaction subsides, condoms are used at all times except at the expected time of ovulation. Approximately one third of couples with this problem conceive by following this course of action.

Changes in nutrition and habits may increase fertility for both men and women. For example, a well – balanced diet, exercise, decreased alcohol intake, not smoking or abusing drugs, and stress management also are effective.

3- Herbal alternative measures

Most herbal remedies have not been proven clinically to promote fertility or to be safe in early pregnancy.

Relaxation, osteopathy, stress management (aromatherapy, yoga), and nutritional and exercise counseling have increased pregnancy rates in some women. Herbal remedies that reportedly promote fertility in general include red clover flowers البرسيم الاحمر, nettle leaves القراص الشوكي , dong quai, St. John's wort حشيشة القلب , chasteberry, and false unicorn root. Vitamin C, calcium, and magnesium may promote fertility and conception.

red clover flowers

nettle leaves

dong quai

St. John's wort

chasteberry

false unicorn root

Vitamins E and C, glutathione, and coenzyme Q10 are antioxidants that have proven beneficial effects for male infertility. Herbs to avoid while trying to conceive include licorice root جذور عروق السوس, yarrow, wormwood الشيح , ephedra, fennel, goldenseal, lavender, juniper, flaxseed, pennyroyal النعناع , passionflower, wild cherry, cascara, sage الميرمية , thyme, and periwinkle.

LICORICE ROOT

yarrow

wormwood

ephedra

fennel

goldenseal

lavender

passionflower

juniper

periwinkle

4- Medical

Pharmacologic therapy for female infertility is often directed at treating ovulatory dysfunction either by stimulating ovulation or by enhancing ovulation so that more oocytes mature. The most common medications include clomiphene citrate, human menopausal gonadotropin (hMG) , FSH, human chorionic gonadotropin (hCG) , and GnRH, Metformin (an insulin sensitizing agent) is used for anovulatory cycling women who have polycystic ovarian disease.

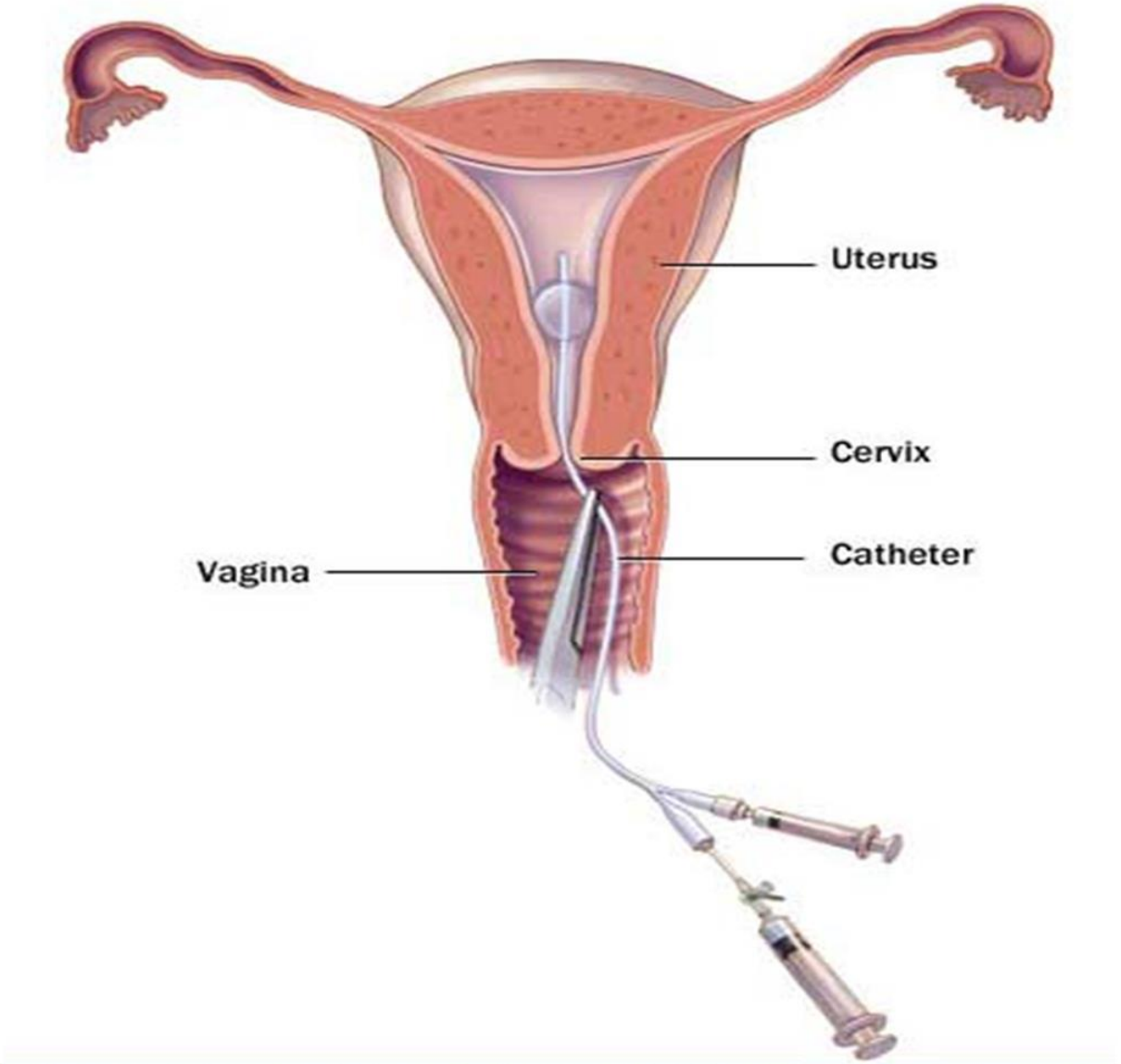
- Bromocriptine is used to treat anovulation associated with hyperprolactinemia.
- Thyroid stimulating hormone is indicated if the woman has hypothyroidism.
- Combined oral contraceptives, GnRH agonists, or danazol may be used to treat endometriosis.

- Drug therapy may be indicated for male infertility.
- Infections are treated promptly with antimicrobials. FSH , hMG , and clomiphene are sometimes used to stimulate spermatogenesis in men with hypogonadism.

5- Surgical

Several surgical procedures treat problems that cause female infertility.

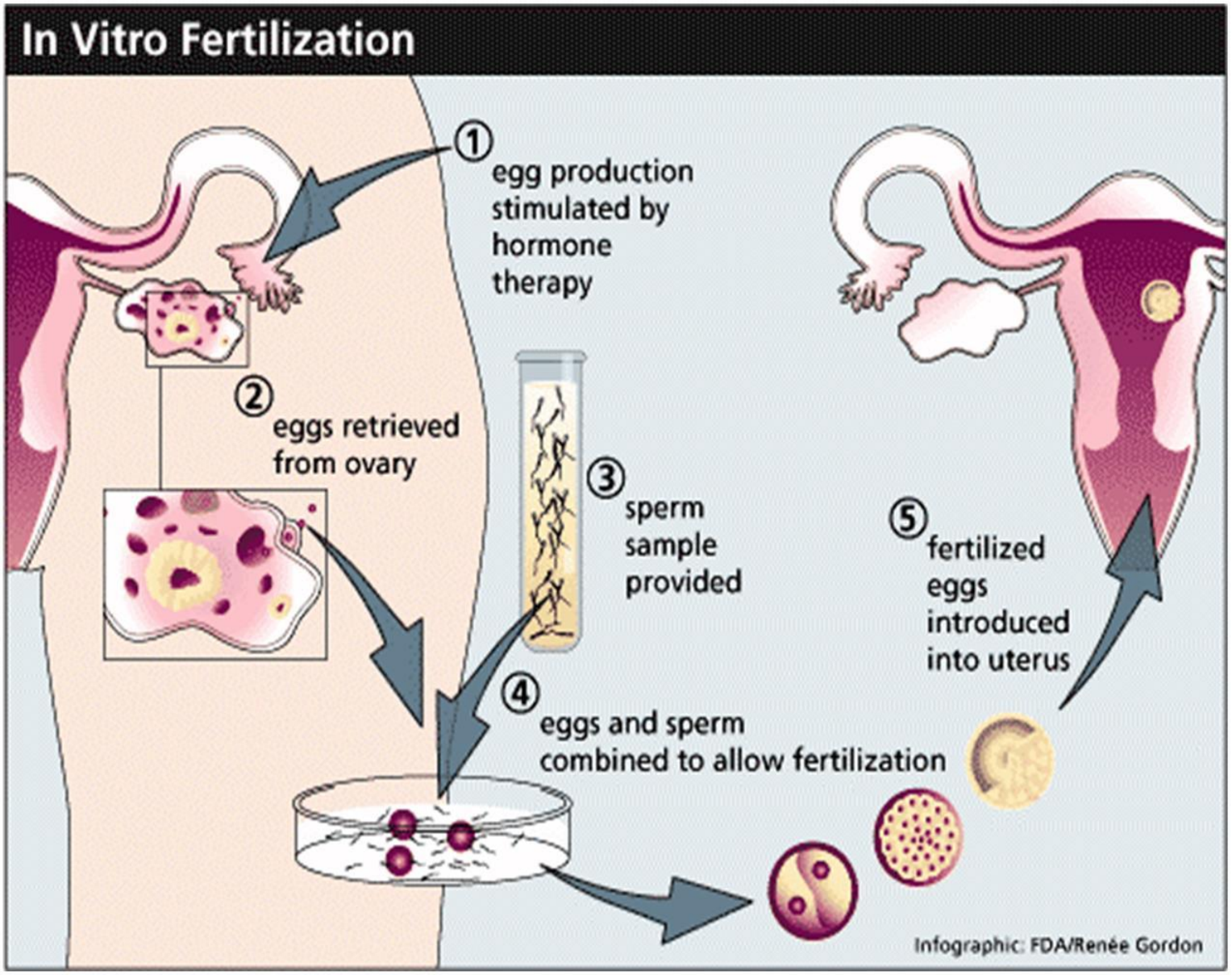
- Ovarian tumors must be excised or fibroids
- Hysterosalpingography is useful for the identification of tubal obstruction and for the release of blockage.
- Surgical repair of a varicocele (varicosity in the network of veins that drain the testicles)



Reproductive alternatives

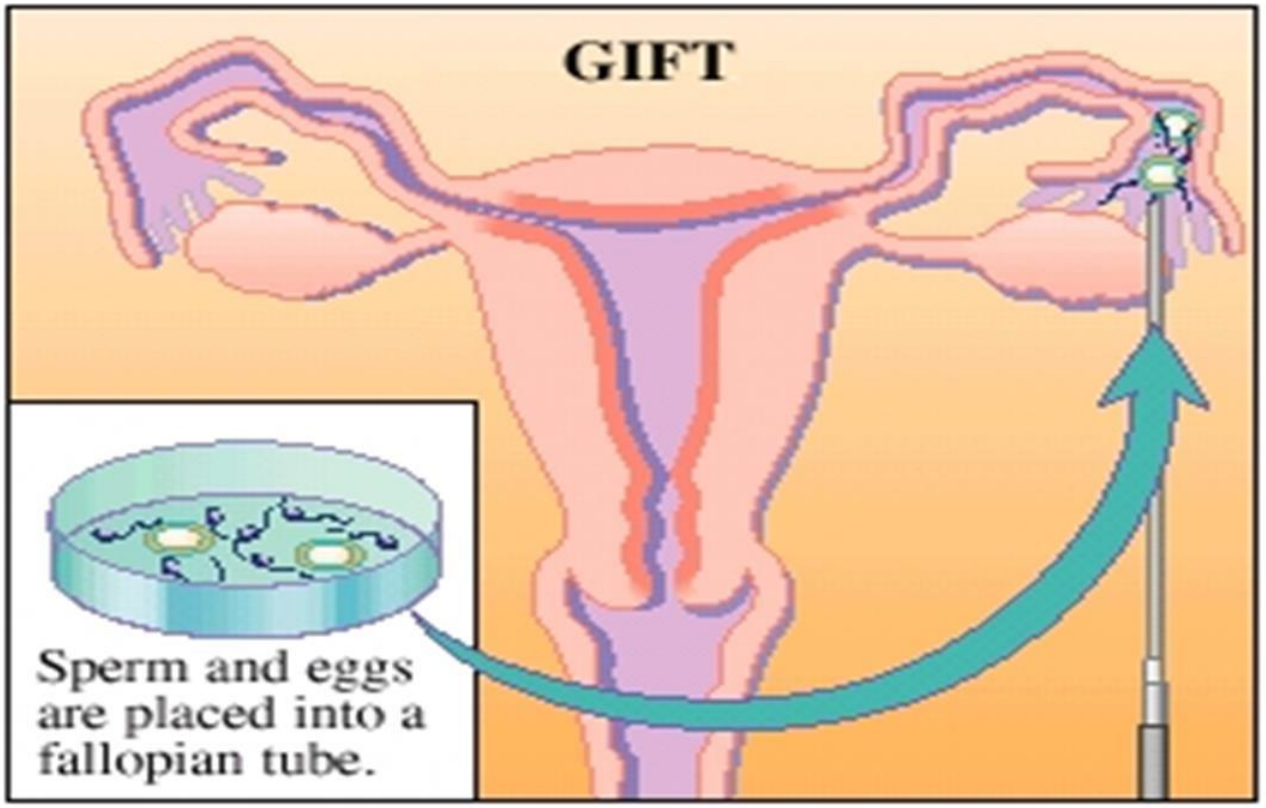
Assisted reproductive therapies (ARTs) account for less than 1% of all U.S births and less than 3% of infertility treatment. They associated with many ethical and legal issues.

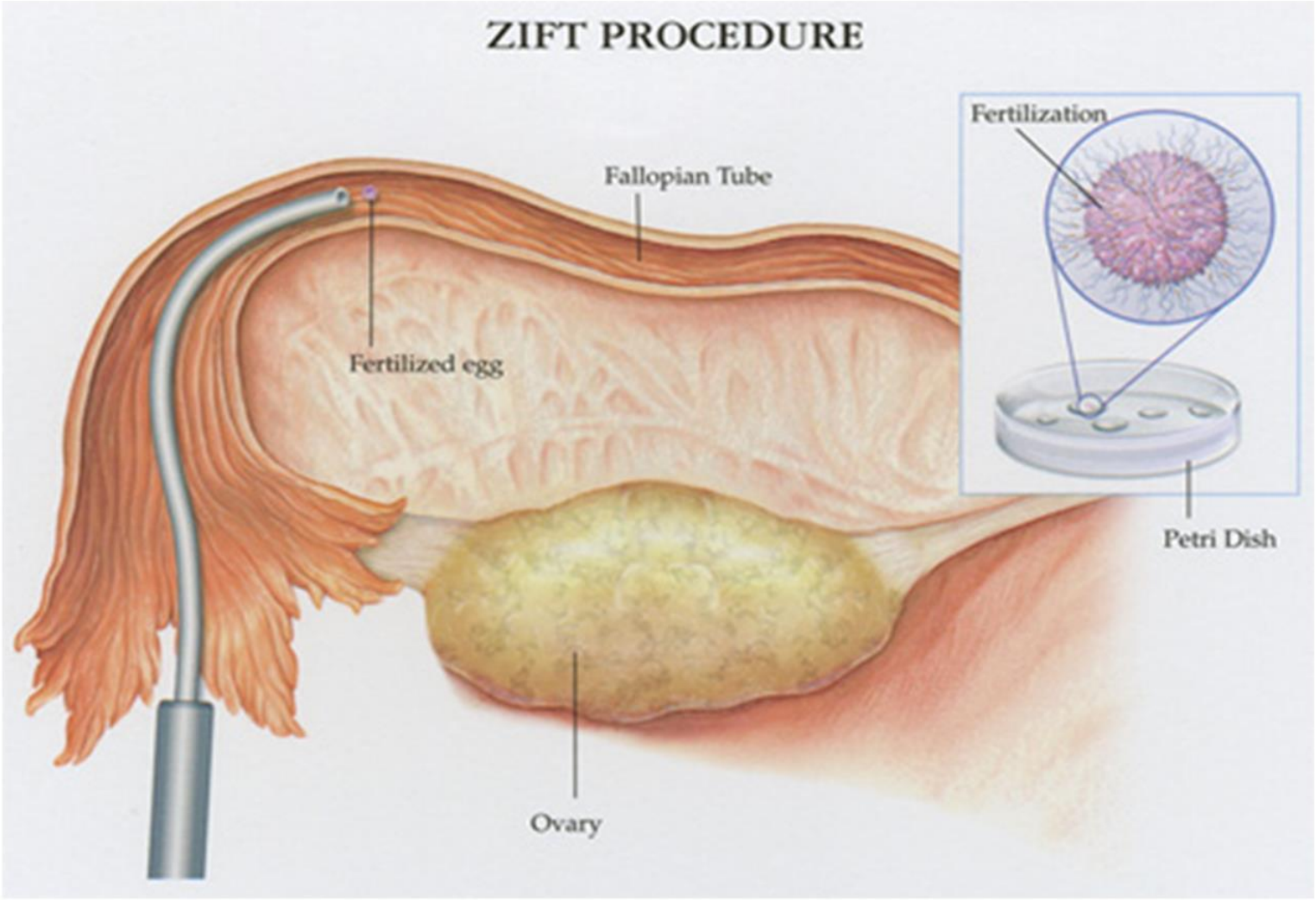
Some of the ARTs for treatment of infertility include in vitro fertilization procedures: IVF- embryo transfer, gamete intra fallopian transfer, zygote IFT, ovum transfer, embryo adoption, embryo hosting, surrogate mothering.



GIFT

With GIFT, sperm and eggs are placed in a fallopian tube to allow fertilization in the natural site. The woman must have at least one normal, open fallopian tube.





Complications

- Multiple gestations are more likely
- Ectopic pregnancy

Preimplantation genetic diagnosis

PGD is a form of early genetic testing designed to identify embryos with serious genetic defects before implantation through one of the ARTs.

Thanks

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