STANDARD IVF

In Vitro Fertilization, Fertilization

A process in which an egg is fertilised by sperm outside the body: in vitro. Own or donated gametes may be used.

About Standard IVF

In vitro fertilization (IVF) is a process by which an egg is fertilised by sperm outside the body: in vitro. The process involves monitoring and stimulating a woman's ovulatory process, removing an ovum or ova (egg or eggs) from the woman's ovaries and letting sperm fertilise them in a liquid in a laboratory. The fertilised egg (zygote) is cultured for 2–6 days in a growth medium and is then implanted in the same or another woman's uterus, with the intention of establishing a successful pregnancy.

IVF techniques can be used in different types of situations. It is a technique of assisted reproductive technology for treatment of infertility. IVF techniques are also employed in gestational surrogacy, in which case the fertilised egg is implanted into a surrogate's uterus, and the resulting child is genetically unrelated to the surrogate. In some situations, donated eggs or sperms may be used. Some countries ban or otherwise regulate the availability of IVF treatment, giving rise to fertility tourism. Restrictions on availability of IVF include to single females, to lesbians and to surrogacy arrangements. Due to the costs of the procedure, IVF is mostly attempted only after less expensive options have failed.

The first successful birth of a "test tube baby", Louise Brown, occurred in 1978. Louise Brown was born as a result of natural cycle IVF where no stimulation was made. Robert G. Edwards, the physiologist who developed the treatment, was awarded the Nobel Prize in Physiology or Medicine in 2010. With egg donation and IVF, women who are past their reproductive years or
Menopause can still become pregnant. Adriana Iliescu held the record as the oldest woman to give birth using IVF and donated egg, when she gave birth in 2004 at the age of 66, a record passed in 2006.

### Success or failure factors

IVF may be used to overcome female infertility where it is due to problems with the fallopian tubes, making fertilisation in vivo difficult. It can also assist in male infertility, in those cases where there is a defect in sperm quality; in such situations intracytoplasmic sperm injection (ICSI) may be used, where a sperm cell is injected directly into the egg cell. This is used when sperm has difficulty penetrating the egg, and in these cases the partner's or a donor's sperm may be used. ICSI is also used when sperm numbers are very low. When indicated, the use of ICSI has been found to increase the success rates of IVF.

According to the British NICE guidelines, IVF treatment is appropriate in cases of unexplained infertility for women that have not conceived after 2 years of regular unprotected sexual intercourse.[1] This rule does not apply to all countries. (See infertility.)

IVF is also considered suitable in cases where any of its expansions is of interest, that is, a procedure that is usually not necessary for the IVF procedure itself, but would be virtually impossible or technically difficult to perform without concomitantly performing methods of IVF. Such expansions include preimplantation genetic diagnosis (PGD) to rule out presence of genetic disorders, as well as egg donation or surrogacy where the woman providing the egg isn't the same who will carry the pregnancy to term.

### Complications

The major complication of IVF is the risk of multiple births. This is directly related to the practice of transferring multiple embryos at embryo transfer. Multiple births are related to increased risk of pregnancy loss, obstetrical complications, prematurity, and neonatal morbidity with the potential for long term damage. Strict limits on the number of embryos that may be transferred have been enacted in some countries (e.g. Britain, Belgium) to reduce the risk of high-order multiples (triplets or more), but are not universally followed or accepted. Spontaneous splitting of embryos in the womb after transfer can occur, but this is rare and would lead to identical twins. A double blind, randomised study followed IVF pregnancies that resulted in 73 infants (33 boys and 40 girls) and reported that 8.7% of singleton infants and 54.2% of
twins had a birth weight of < 2,500 grams (5.5 lb).

Recent evidence also suggest that singleton offspring after IVF is at higher risk for lower birth weight for unknown reasons.

Spread of infectious disease By sperm washing, the risk that a chronic disease in the male providing the sperm would infect the female or offspring can be brought to negligible levels. In males with hepatitis B, The Practice Committee of the American Society for Reproductive Medicine advises that sperm washing is not necessary in IVF to prevent transmission, unless the female partner has not been effectively vaccinated. In females with hepatitis B, the risk of vertical transmission during IVF is no different from the risk in spontaneous conception. However, there is not enough evidence to say that ICSI procedures are safe in females with hepatitis B in regard to vertical transmission to the offspring. Regarding potential spread of HIV/AIDS, Japan’s government prohibited the use of in vitro fertilisation procedures for couples in which both partners are infected with HIV. Despite the fact that the ethics committees previously allowed the Ogikubo, Tokyo Hospital, located in Tokyo, to use in vitro fertilisation for couples with HIV, the Ministry of Health, Labour and Welfare of Japan decided to block the practice. Hideji Hanabusa, the vice president of the Ogikubo Hospital, states that together with his colleagues, he managed to develop a method through which scientists are able to remove HIV from sperm.

Other risks to the egg provider/retriever A risk of ovarian stimulation is the development of ovarian hyperstimulation syndrome, particularly if hCG is used for inducing final oocyte maturation. This results in swollen, painful ovaries. It occurs in 30% of patients. Mild cases can be treated with over the counter medications and cases can be resolved in the absence of pregnancy. In moderate cases, ovaries swell and fluid accumulated in the abdominal cavities and may have symptoms of heartburn, gas, nausea or loss of appetite. In severe cases patients have sudden excess abdominal pain, nausea, vomiting and will result in hospitalisation.

During egg retrieval, there’s a small chance of bleeding, infection, and damage to surrounding structures like bowel and bladder (transvaginal ultrasound aspiration) as well as difficulty in breathing, chest infection, allergic reactions to medication, or nerve damage (laproscopy). Ectopic pregnancy may also occur if a fertilised egg develops outside the uterus, usually in the fallopian tubes and requires immediate destruction of the foetus. IVF does not seem to be associated with an elevated risk of cervical cancer, nor with ovarian cancer or endometrial cancer when neutralising the confounder of infertility itself. Nor does it seem to impart any increased risk for breast cancer. Regardless of pregnancy result, IVF treatment is usually stressful for patients. Neuroticism and the use of escapist coping strategies are associated with a higher degree of distress, while the presence social support has a relieving effect. A negative
pregnancy test after IVF is associated with an increased risk for depression in women, but not with any increased risk of developing anxiety disorders. Pregnancy test results do not seem to be a risk factor for depression or anxiety among men.

Prognosis

Predictors of success

The main potential factors that influence pregnancy (and live birth) rates in IVF have been suggested to be maternal age, sperm quality, duration of infertility or subfertility, bFSH and number of oocytes, all reflecting ovarian function. Optimal woman’s age is 23–39 years at time of treatment. Antral follicle count, with higher count giving higher success rates. Biomarkers that affect the pregnancy chances of IVF include:

- Anti-Müllerian hormone levels, with higher levels indicating higher chances of pregnancy, as well as of live birth after IVF, even after adjusting for age.

- Factors of semen quality for the sperm provider.

- Level of DNA fragmentation as measured e.g. by Comet assay, advanced maternal age and semen quality.

- Women with ovary-specific FMR1 genotypes including het-norm/low have significantly decreased pregnancy chances in IVF.

- Progesterone elevation (PE) on the day of induction of final maturation is associated with lower pregnancy rates in IVF cycles in women undergoing ovarian stimulation using GnRH analogues and gonadotrophins. At this time, compared to a progesterone level below 0.8 ng/ml, a level between 0.8 and 1.1 ng/ml confers an odds ratio of pregnancy of approximately 0.8, and a level between 1.2 and 3.0 ng/ml confers an odds ratio of pregnancy of between 0.6 and 0.7. On the other hand, progesterone elevation does not seem to confer a decreased chance of pregnancy in frozen–thawed cycles and cycles with egg donation.

- Characteristics of cells from the cumulus oophorus and the membrana granulosa, which are easily aspirated during oocyte retrieval. These cells are closely associated with the oocyte and share the same microenvironment, and the rate of expression of certain genes in such cells are associated with higher or lower pregnancy rate.

- An endometrial thickness (EMT) of less than 7 mm decreases the pregnancy rate by an odds ratio of approximately 0.4 compared to an EMT of over 7 mm. However, such low thickness rarely occurs, and any routine use of this parameter is regarded as not justified.

Other determinants of outcome of IVF include:

- Tobacco smoking reduces the chances of IVF producing a live birth by
34% and increases the risk of an IVF pregnancy miscarrying by 30%.

- A body mass index (BMI) over 27 causes a 33% decrease in likelihood to have a live birth after the first cycle of IVF, compared to those with a BMI between 20 and 27. Also, pregnant women who are obese have higher rates of miscarriage, gestational diabetes, hypertension, thromboembolism and problems during delivery, as well as leading to an increased risk of fetal congenital abnormality. Ideal body mass index is 19–30.
- Salpingectomy or laparoscopic tubal occlusion before IVF treatment increases chances for women with hydrosalpinges
- Success with previous pregnancy and/or live birth increases chances
- Low alcohol/caffeine intake increases success rate
- The number of embryos transferred in the treatment cycle
- Embryo quality
- Some studies also suggest the autoimmune disease may also play a role in decreasing IVF success rates by interfering with proper implantation of the embryo after transfer.

Aspirin is sometimes prescribed to women for the purpose of increasing the chances of conception by IVF, but there is insufficient evidence to show that it actually works. A 2013 review and metaanalysis of randomised controlled trials of acupuncture as an adjuvant therapy in IVF found no overall benefit, and concluded that an apparent benefit detected in a subset of published trials where the control group (those not using acupuncture) experienced a lower than average rate of pregnancy requires further study, due to the possibility of publication bias and other factors.

A Cochrane review came to the result that endometrial injury performed in the month prior to ovarian hyperstimulation appeared to increase both the live birth rate and clinical pregnancy rate in IVF compared with no endometrial injury. However, there was a lack of data reported on the rates of adverse outcomes such as miscarriage, multiple pregnancy, pain and/or bleeding. For females, intake of antioxidants (such as N-acetyl-cysteine, melatonin, vitamin A, vitamin C, vitamin E, folic acid, myo-inositol, zinc or selenium have not been associated with a significantly increased live birth rate or clinical pregnancy rate in IVF according to Cochrane reviews. On the other hand, oral antioxidants given to the men in couples with male factor or unexplained subfertility resulted in significantly higher live birth rate in IVF.

A Cochrane review in 2013 came to the result that there is no evidence identified regarding the effect of pre-conception lifestyle advice on the chance of a live birth outcome.
**Abnormal semen pH**
A semen pH value outside of the normal range which is harmful to sperm and can cause infertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/abnormal-semen-ph](http://www.fertilitypedia.org/therapy/diag/abnormal-semen-ph)

**Absent uterus**
Female disorder in reproductive system at which a woman miss the uterus and thus she is not able to get pregnant and carry a child.
Learn more at: [www.fertilitypedia.org/therapy/diag/absent-uterus](http://www.fertilitypedia.org/therapy/diag/absent-uterus)

**Adenocarcinoma**
A type of cancerous tumor that develops in the gland cells.
Learn more at: [www.fertilitypedia.org/therapy/diag/adenocarcinoma](http://www.fertilitypedia.org/therapy/diag/adenocarcinoma)

**Adenomyoma**
A tumor-forming variant of adenomyosis (endometriosis in the myometrium of the uterus).
Learn more at: [www.fertilitypedia.org/therapy/diag/adenomyoma](http://www.fertilitypedia.org/therapy/diag/adenomyoma)

**Adenomyosis**
Medical condition characterized by the presence of ectopic endometrial tissue within the myometrium.
Learn more at: [www.fertilitypedia.org/therapy/diag/adeno.jpg](http://www.fertilitypedia.org/therapy/diag/adenomyosis)

**Adrenal insufficiency**
Failure of the adrenal glands to produce sufficient amounts of hormones.
Learn more at: [www.fertilitypedia.org/therapy/diag/adrenal-insufficiency](http://www.fertilitypedia.org/therapy/diag/adrenal-insufficiency)

**Amenorrhoea**
The absence of a menstrual period in women of reproductive age.
Learn more at: [www.fertilitypedia.org/therapy/diag/amenorrhoea](http://www.fertilitypedia.org/therapy/diag/amenorrhoea)

**Anejaculation**
The pathological inability to ejaculate in males, with (orgasmic) or without (anorgasmic) orgasm.
Learn more at: [www.fertilitypedia.org/therapy/diag/anejaculation](http://www.fertilitypedia.org/therapy/diag/anejaculation)
**Angelman syndrome**
A neurodevelopmental disorder with intellectual and developmental disability, sleep disturbance, seizures, jerky movements and frequent laughter.  
Learn more at: [www.fertilitypedia.org/therapy/diag/angelman-syndrome](http://www.fertilitypedia.org/therapy/diag/angelman-syndrome)

**Anorchia**
A disorder of sex development in which individuals have both testes absent at birth.  
Learn more at: [www.fertilitypedia.org/therapy/diag/anorchia](http://www.fertilitypedia.org/therapy/diag/anorchia)

**Anorexia Nervosa**
An eating disorder characterized by the maintenance of a body weight below average, fear of gaining weight, and a distorted body image.  
Learn more at: [www.fertilitypedia.org/therapy/diag/anorexia-nervosa](http://www.fertilitypedia.org/therapy/diag/anorexia-nervosa)

**Anovulation**
Failure of the ovaries to release an oocyte over a period of time generally exceeding 3 months.  
Learn more at: [www.fertilitypedia.org/therapy/diag/anovulation](http://www.fertilitypedia.org/therapy/diag/anovulation)

**Antiphospholipid syndrome**
A condition when immune system mistakenly attacks some of the standard proteins in blood.  
Learn more at: [www.fertilitypedia.org/therapy/diag/antiphospholipid-syndrome-do-rf](http://www.fertilitypedia.org/therapy/diag/antiphospholipid-syndrome-do-rf)

**Asherman’s syndrome**
A medical condition, where the walls of the uterus stick to one another due to bands of scar tissue.  
Learn more at: [www.fertilitypedia.org/therapy/diag/asherman-s-syndrome](http://www.fertilitypedia.org/therapy/diag/asherman-s-syndrome)

**Aspermia**
Male diagnosis connected with male infertility characterised by the complete absence of semen.  
Learn more at: [www.fertilitypedia.org/therapy/diag/aspermia](http://www.fertilitypedia.org/therapy/diag/aspermia)

**Atherosclerosis**
The thickening, hardening and loss of elasticity of the walls of arteries.  
Learn more at: [www.fertilitypedia.org/therapy/diag/atherosclerosis](http://www.fertilitypedia.org/therapy/diag/atherosclerosis)
Autoimmune disorders
A condition arising from an abnormal immune response to a normal body part.
Learn more at: www.fertilitypedia.org/therapy/diag/autoimmune-disorders-1

Autoimmune thyroid disease
A disease in which antibodies against the thyroid gland and its hormone products are produced and destroy the thyroid’s cells and the entire gland.
Learn more at: www.fertilitypedia.org/therapy/diag/autoimmune-thyroid-disease

Azoospermia
Complete absence of sperm in the ejaculate of a man.
Learn more at: www.fertilitypedia.org/therapy/diag/azoospermia

Benign prostatic hyperplasia
A noncancerous increase in size of the prostate.
Learn more at: www.fertilitypedia.org/therapy/diag/benign-prostatic-hyperplasia

Bicornuate uterus
Inborn morphological deviation of the uterus - one of the Müllerian duct anomalies where the uterine cavity is divided in the upper part.
Learn more at: www.fertilitypedia.org/therapy/diag/bicornuate-uterus

Bilateral fallopian tube blockage
A blockage of both fallopian tubes.
Learn more at: www.fertilitypedia.org/therapy/diag/bilateral-fallopian-tube-blockage

Breast cancer
A cancer that develops from breast tissue.
Learn more at: www.fertilitypedia.org/therapy/diag/breast-cancer

Cervical mucus defect
Condition causing cervical mucus too thick and hostile to allow the sperm to penetrate the cervix.
Learn more at: www.fertilitypedia.org/therapy/diag/cervical-mucus-defect

Cervical stenosis
Narrowing of cervix - the opening to the uterus.
Learn more at: www.fertilitypedia.org/therapy/diag/cervical-stenosis
Chlamydia infection
A common sexually transmitted disease (STD) caused by the Chlamydia trachomatis bacteria that can lead to serious reproductive morbidity.
Learn more at: www.fertilitypedia.org/therapy/diag/chlamydia-infection

Congenital absence of the vas deferens
A condition in which the vasa deferentia reproductive organs, fail to form properly prior to birth.
Learn more at: www.fertilitypedia.org/therapy/diag/congenital-absence-of-the-vas-deferens

Congenital tubal obstruction
Fallopian tube(s) blocked from birth unabling to let the ovum and the sperm converge, thus making fertilization impossible.
Learn more at: www.fertilitypedia.org/therapy/diag/congenital-tubal-obstruction

Cryptozoospermia
Male infertility diagnosis characterized by extremely low concentration of sperm in semen.
Learn more at: www.fertilitypedia.org/therapy/diag/cryptozoospermia

Delayed ejaculation
A man's inability for or persistent difficulty in achieving orgasm, despite typical sexual desire and sexual stimulation.
Learn more at: www.fertilitypedia.org/therapy/diag/delayed-ejaculation

Ejaculatory disorders
A class of sexual disorders defined as the subjective lack of normal ejaculation.
Learn more at: www.fertilitypedia.org/therapy/diag/ejaculatory-disorders

Endometrial cancer
Cancer that arises from the endometrium, the lining of the uterus.
Learn more at: www.fertilitypedia.org/therapy/diag/endometrial-cancer

Endometrial hyperplasia
Thickening of the lining of the uterus.
Learn more at: www.fertilitypedia.org/therapy/diag/endometrial-hyperplasia
Endometrial polyp
The finger-like overgrowths attached to the inner wall of the uterus that extend into the uterine cavity which are made of endometrial tissue.
Learn more at: www.fertilitypedia.org/therapy/diag/endometrial-polyp

Endometrioma
Benign ovarian cysts containing thick, old blood that appears as a brown fluid.
Learn more at: www.fertilitypedia.org/therapy/diag/endometrioma

Endometriosis
A state in which pieces of the tissue alike to the lining of the uterus (endometrium) grow in other parts of the body.
Learn more at: www.fertilitypedia.org/therapy/diag/endometriosis

Endometritis
An inflammation of the inner uterine lining that could interfere with conception and pregnancy outcomes.
Learn more at: www.fertilitypedia.org/therapy/diag/endometritis

Epididymitis
An inflammation of epididymis.
Learn more at: www.fertilitypedia.org/therapy/diag/epididymitis

Erectile dysfunction
The inability (that lasts more than 6 months) to develop or maintain an erection of the penis during sexual activity.
Learn more at: www.fertilitypedia.org/therapy/diag/erectile-dysfunction

Fallopian tube blockage
An obstruction prevents the egg or sperm from traveling down the tube, thus making fertilization impossible.
Learn more at: www.fertilitypedia.org/therapy/diag/fallopian-tube-blockage

Fallopian tube cancer
An abnormal growth of fallopian tube tissue.
Learn more at: www.fertilitypedia.org/therapy/diag/fallopian-tube-cancer
**Fragile X syndrome**
Genetic condition that is the most common inherited cause of intellectual disability, as well as the most frequent cause of autism spectrum disorder.
Learn more at: [www.fertilitypedia.org/therapy/diag/fragile-x-syndrome](http://www.fertilitypedia.org/therapy/diag/fragile-x-syndrome)

**Genital herpes**
A sexually transmitted infection which is the most common cause of diseases accompanied by genital ulceration.
Learn more at: [www.fertilitypedia.org/therapy/diag/genital-herpes](http://www.fertilitypedia.org/therapy/diag/genital-herpes)

**Genital warts**
Fleshy growths or lumps found around the genitals and anus transmitted through sexual intercourse or during labor.
Learn more at: [www.fertilitypedia.org/therapy/diag/genital-warts](http://www.fertilitypedia.org/therapy/diag/genital-warts)

**Gestational trophoblastic disease**
A group of rare diseases in which abnormal trophoblast cells grow inside the uterus after conception.
Learn more at: [www.fertilitypedia.org/therapy/diag/gestational-trophoblastic-disease](http://www.fertilitypedia.org/therapy/diag/gestational-trophoblastic-disease)

**Globozoospermia**
Globozoospermia is characterized by the presence of acrosomeless round-headed spermatozoa with normal chromosomal content.
Learn more at: [www.fertilitypedia.org/therapy/diag/globozoospermia](http://www.fertilitypedia.org/therapy/diag/globozoospermia)

**Gonadal dysgenesis**
Any congenital developmental disorder of the reproductive system characterized by a progressive loss of germ cells on the developing gonads.
Learn more at: [www.fertilitypedia.org/therapy/diag/gonadal-dysgenesis](http://www.fertilitypedia.org/therapy/diag/gonadal-dysgenesis)

**Gonorrhoea infection**
A sexually transmitted infection caused by the bacterium Neisseria gonorrhoeae.
Learn more at: [www.fertilitypedia.org/therapy/diag/gonorrhoea-infection](http://www.fertilitypedia.org/therapy/diag/gonorrhoea-infection)

**Gynatresia**
Oclusion of some part of the female genital tract, especially occlusion of the vagina by a thick membrane.
Learn more at: [www.fertilitypedia.org/therapy/diag/gynatresia](http://www.fertilitypedia.org/therapy/diag/gynatresia)
**Heart disease**
Various types of conditions that can affect the function of the heart or blood vessels, which may have the negative effect also to the infertility
Learn more at: www.fertilitypedia.org/therapy/diag/heart-disease

**Hematometra**
A collection or retention of blood in the uterus, affecting the patient’s fertility.
Learn more at: www.fertilitypedia.org/therapy/diag/hematometra

**Hematosalpinx**
Hematosalpinx is a medical condition involving bleeding into the fallopian tube.
Learn more at: www.fertilitypedia.org/therapy/diag/hematosalpinx

**Hepatitis B**
An infection caused by the hepatitis B virus which inflames the liver and which could also impair sperm motility.
Learn more at: www.fertilitypedia.org/therapy/diag/hepatitis-b

**Hepatitis C**
An infection caused by the hepatitis C virus (HCV) that affects the liver and could be transmitted through sexual intercourse by blood or from infecte
Learn more at: www.fertilitypedia.org/therapy/diag/hepatitis-c

**HIV**
A viral infection that progressively destroys certain white blood cells and can cause acquired immunodeficiency syndrome (AIDS).
Learn more at: www.fertilitypedia.org/therapy/diag/hiv

**Human papillomavirus**
A common virus that affects both males and females that could result in genital warts or cancer.
Learn more at: www.fertilitypedia.org/therapy/diag/human-papillomavirus

**Hydrocele testis**
An accumulation of clear fluid in the tunica vaginalis, the most internal of membranes containing a testicle.
Learn more at: www.fertilitypedia.org/therapy/diag/hydrocele-testis
Hydrosalpinx
A hydrosalpinx is an abnormal pouch containing liquid in a fallopian tube.
Learn more at: www.fertilitypedia.org/therapy/diag/hydrosalpinx

Hyperandrogenism
A medical condition characterized by excessive levels of androgens in the body.
Learn more at: www.fertilitypedia.org/therapy/diag/hyperandrogenism

Hyperestrogenism
An excessive amount of estrogenic activity in the body.
Learn more at: www.fertilitypedia.org/therapy/diag/hyperestrogenism

Hypergonadotropic hypogonadism
Decreased functional activity of the gonads, with retardation sexual development, associated with high levels of hormones that stimulate the gonads.
Learn more at: www.fertilitypedia.org/therapy/diag/hypergonadotropic-hypogonadism

Hypergonadotropism
The condition of elevated concentrations of gonadotropins within the blood.
Learn more at: www.fertilitypedia.org/therapy/diag/hypergonadotropism

Hyperinsulinaemia
Excess levels of insulin circulating in the blood relative to the level of glucose and impairing the hormonal levels, even those involved in reproduction.
Learn more at: www.fertilitypedia.org/therapy/diag/hyperinsulinaemia

Hyperlipidemia
Abnormally elevated levels of any or all lipids in the blood.
Learn more at: www.fertilitypedia.org/therapy/diag/hyperlipidemia

Hyperprolactinemia
The presence of abnormally high levels of prolactin in the blood.
Learn more at: www.fertilitypedia.org/therapy/diag/hyperprolactinemia

Hyperthyroidism
Condition that occurs due to excessive production of thyroid hormone by the thyroid gland.
Learn more at: www.fertilitypedia.org/therapy/diag/hyperthyroidism
Hypoandrogenism
A medical condition characterized by not enough androgenic activity in the body.
Learn more at: www.fertilitypedia.org/therapy/diag/hypoandrogenism

Hypoestrogenism
A lower than normal level of estrogen which is the primary sex hormone in women.
Learn more at: www.fertilitypedia.org/therapy/diag/hypoestrogenism

Hypogonadism
A medical term which describes a diminished functional activity of the gonads – the testes and ovaries.
Learn more at: www.fertilitypedia.org/therapy/diag/hypogonadism

Hypopituitarism
Partial or complete loss of production of one or more of the pituitary gland hormones.
Learn more at: www.fertilitypedia.org/therapy/diag/hypopituitarism

Hypoprolactinemia
A deficiency in the serum levels of the prolactin hormone.
Learn more at: www.fertilitypedia.org/therapy/diag/hypoprolactinemia

Hypoplasias
An anomaly of the penis, with the opening of the urethra located on the underside of the penis, which may lead to infertility.
Learn more at: www.fertilitypedia.org/therapy/diag/hypospadias

Hypospermia
A condition in which a man has an unusually low ejaculate (or semen) volume.
Learn more at: www.fertilitypedia.org/therapy/diag/hypospermia

Hypothalamus malfunction
Group of diseases, which have impact on function of hypothalamus.
Learn more at: www.fertilitypedia.org/therapy/diag/hypothalamus-malfunction

Hysterecstomy
A surgery performed to remove a woman's uterus.
Learn more at: www.fertilitypedia.org/therapy/diag/hysterectomy
**Idiopathic male infertility**
A condition in which fertility impairment occurs spontaneously or due to an unknown cause.
Learn more at: www.fertilitypedia.org/therapy/diag/idiopathic-male-infertility

**Kallmann syndrome**
A genetic condition where the primary symptom is a failure to start puberty or a failure to fully complete puberty.
Learn more at: www.fertilitypedia.org/therapy/diag/kallmann-syndrome

**Klinefelter syndrome**
The set of symptoms that result from two or more X chromosome in males.
Learn more at: www.fertilitypedia.org/therapy/diag/klinefelter-syndrome

**Laurence-Moon syndrome**
Laurence-Moon syndrome (LMS) is a genetically predisposed disorder affecting both genders.
Learn more at: www.fertilitypedia.org/therapy/diag/laurence-moon-syndrome

**Leukospermia**
A presence of more than one million of white blood cells in 1 millimeter (mL) of ejaculate.
Learn more at: www.fertilitypedia.org/therapy/diag/leukospermia

**Low responders**
Patients with a low number of retrieved oocytes despite adequate ovarian stimulation during fertility treatment.
Learn more at: www.fertilitypedia.org/therapy/diag/low-responders

**Lupus erythematosus**
Collection of autoimmune diseases in which the human immune system becomes hyperactive and attacks normal, healthy tissues.
Learn more at: www.fertilitypedia.org/therapy/diag/lupus-erythematosus

**Luteinised unruptured follicle syndrome**
The luteinisation of ovulatory follicle without a release of an oocyte.
Learn more at: www.fertilitypedia.org/therapy/diag/luteinised-unruptured-follicle-syndrome
**Menopause**
The time in most women's lives when menstrual periods stop permanently, and the woman is no longer able to have children.
Learn more at: [www.fertilitypedia.org/therapy/diag/menopause](http://www.fertilitypedia.org/therapy/diag/menopause)

**Menstrual cycle disorders**
An abnormal condition in a woman's menstrual cycle.
Learn more at: [www.fertilitypedia.org/therapy/diag/menstrual-cycle-disorders](http://www.fertilitypedia.org/therapy/diag/menstrual-cycle-disorders)

**Monorchism**
The condition of only one testicle present in the scrotum.
Learn more at: [www.fertilitypedia.org/therapy/diag/monorchism](http://www.fertilitypedia.org/therapy/diag/monorchism)

**Mumps**
Mumps was a common childhood viral disease caused by the mumps virus. Mumps frequently causes orchitis and impairs male fertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/mumps](http://www.fertilitypedia.org/therapy/diag/mumps)

**Necrospermia**
Necrospermia is a condition in which spermatozoa in semen are either immobile or dead
Learn more at: [www.fertilitypedia.org/therapy/diag/necrospermia](http://www.fertilitypedia.org/therapy/diag/necrospermia)

**Non-Hodgkin lymphoma**
Type of cancer arising from the lymphoid tissue.
Learn more at: [www.fertilitypedia.org/therapy/diag/non-hodgkin-lymphoma](http://www.fertilitypedia.org/therapy/diag/non-hodgkin-lymphoma)

**Non-obstructive azoospermia**
Complete absence of sperm in the ejaculate due to testicular failure.
Learn more at: [www.fertilitypedia.org/therapy/diag/non-obstructive-azoospermia](http://www.fertilitypedia.org/therapy/diag/non-obstructive-azoospermia)

**Noonan syndrome**
A frequent autosomal dominant developmental disorder primarily characterized by short stature, typical facial features and heart defects.
Learn more at: [www.fertilitypedia.org/therapy/diag/noonan-syndrome](http://www.fertilitypedia.org/therapy/diag/noonan-syndrome)

**Nutcracker syndrome**
A manifest variant of nutcracker phenomenon, renal vein entrapment syndrome, or mesoaortic compression of the left renal vein.
Learn more at: [www.fertilitypedia.org/therapy/diag/nutcracker-syndrome](http://www.fertilitypedia.org/therapy/diag/nutcracker-syndrome)
**Obesity**
A disease of excess body fat that can have a negative effect on health, leading to reduced life expectancy and other health problems.
Learn more at: [www.fertilitypedia.org/therapy/diag/obesity](http://www.fertilitypedia.org/therapy/diag/obesity)

**Obstructive azoospermia**
Absence of sperm in the ejaculate despite normal spermatogenesis, caused by an obstruction of the genital tract.
Learn more at: [www.fertilitypedia.org/therapy/diag/obstructive-azoospermia](http://www.fertilitypedia.org/therapy/diag/obstructive-azoospermia)

**Obstructive sleep apnea**
Repetitive nocturnal complete collapses (apneas) or partial collapses (hypopneas) of the upper airway during sleep.
Learn more at: [www.fertilitypedia.org/therapy/diag/obstructive-sleep-apnea](http://www.fertilitypedia.org/therapy/diag/obstructive-sleep-apnea)

**Oligoasthenoteratozoospermia**
Male fertility diagnosis defined as a combination of low sperm concentration, reduced motility and abnormal sperm morphology in the ejaculate.
Learn more at: [www.fertilitypedia.org/therapy/diag/oligoasthenoteratozoospermia](http://www.fertilitypedia.org/therapy/diag/oligoasthenoteratozoospermia)

**Oligomenorrhea**
Light or infrequent menstrual flow at intervals of 39 days to 6 months or 5–7 cycles in a year.
Learn more at: [www.fertilitypedia.org/therapy/diag/oligomenorrhea](http://www.fertilitypedia.org/therapy/diag/oligomenorrhea)

**Oligozoospermia**
Semen with a low concentration of sperm and is a common finding in male infertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/oligozoospermia](http://www.fertilitypedia.org/therapy/diag/oligozoospermia)

**Oocyte maturation defect**
Defect during oocyte maturation.
Learn more at: [www.fertilitypedia.org/therapy/diag/oocyte-maturation-defect](http://www.fertilitypedia.org/therapy/diag/oocyte-maturation-defect)

**Orchitis**
An inflammation of the testes, involving swelling and heavy pains.
Learn more at: [www.fertilitypedia.org/therapy/diag/orchitis](http://www.fertilitypedia.org/therapy/diag/orchitis)

**Ovarian cancer**
A type of cancer in which abnormal cells begin to grow in one or both of a woman’s ovaries.
Learn more at: [www.fertilitypedia.org/therapy/diag/ovarian-cancer](http://www.fertilitypedia.org/therapy/diag/ovarian-cancer)
**Ovarian cysts**
Abnormal sacs filled with liquid or semi-solid matter found in the ovary, which can have negative impact on female fertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/ovarian-cysts](http://www.fertilitypedia.org/therapy/diag/ovarian-cysts)

**Ovarian hyperstimulation syndrome**
A clinical symptom complex that can occur in some women undergoing assisted reproductive technologies and that could result in pregnancy complications
Learn more at: [www.fertilitypedia.org/therapy/diag/ovarian-hyperstimulation-syndrome](http://www.fertilitypedia.org/therapy/diag/ovarian-hyperstimulation-syndrome)

**Ovariectomy**
Surgical removal of one or both ovaries.
Learn more at: [www.fertilitypedia.org/therapy/diag/ovariectomy](http://www.fertilitypedia.org/therapy/diag/ovariectomy)

**Painful ejaculation**
A physical syndrome described by pain or burning sensation of the urethra or perineum during or following ejaculation.
Learn more at: [www.fertilitypedia.org/therapy/diag/painful-ejaculation](http://www.fertilitypedia.org/therapy/diag/painful-ejaculation)

**Pelvic actinomycosis infection**
The rare chronic disease typically features a number of small, interlinked abscesses within the pelvis.
Learn more at: [www.fertilitypedia.org/therapy/diag/pelvic-actinomycosis-infection](http://www.fertilitypedia.org/therapy/diag/pelvic-actinomycosis-infection)

**Pelvic adhesions**
A form of abdominal adhesions in the pelvis.
Learn more at: [www.fertilitypedia.org/therapy/diag/pelvic-adhesions](http://www.fertilitypedia.org/therapy/diag/pelvic-adhesions)

**Pelvic Inflammatory Disease**
Infection of the upper part of the female reproductive system and a common complication of some sexually transmitted diseases.

**Pelvic tuberculosis**
An infectious disease caused by the bacterium Mycobacterium tuberculosis and one of cause female infertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/pelvic-tuberculosis](http://www.fertilitypedia.org/therapy/diag/pelvic-tuberculosis)
**Pituitary gland malfunction**
A pituitary malfunction is a disorder affecting the pituitary gland, either by overproduction or underproduction any of pituitary gland hormones.
Learn more at: [www.fertilitypedia.org/therapy/diag/pituitary-gland-malfunction](http://www.fertilitypedia.org/therapy/diag/pituitary-gland-malfunction)

**Pituitary tumor**
An abnormal growth that develops in the pituitary gland that could impair the hormonal balance needed for fertility function.
Learn more at: [www.fertilitypedia.org/therapy/diag/pituitary-tumor](http://www.fertilitypedia.org/therapy/diag/pituitary-tumor)

**Polycystic ovary syndrome**
A condition in which a woman has an imbalance of female sex hormones. This may lead to changes in the menstrual cycle, cysts in the ovaries, trouble g
Learn more at: [www.fertilitypedia.org/therapy/diag/polycystic-ovary-syndrome](http://www.fertilitypedia.org/therapy/diag/polycystic-ovary-syndrome)

**Polyzoospermia**
A condition of abnormally high concentration (more than 250 million / ml) of sperm in the semen.
Learn more at: [www.fertilitypedia.org/therapy/diag/polyzoospermia](http://www.fertilitypedia.org/therapy/diag/polyzoospermia)

**Poor ovarian reserve**
A condition of low fertility characterized by low numbers of remaining oocytes in the ovaries or possibly impaired oocyte development or recruitment.
Learn more at: [www.fertilitypedia.org/therapy/diag/poor-ovarian-reserve](http://www.fertilitypedia.org/therapy/diag/poor-ovarian-reserve)

**Prader-Willi syndrome**
A genetic disorder due to loss of function of specific genes on chromosome 15.
Learn more at: [www.fertilitypedia.org/therapy/diag/prader-willi-syndrome](http://www.fertilitypedia.org/therapy/diag/prader-willi-syndrome)

**Premature ejaculation**
A man experiences orgasm and expels semen soon after sexual activity and with minimal penile stimulation.
Learn more at: [www.fertilitypedia.org/therapy/diag/premature-ejaculation](http://www.fertilitypedia.org/therapy/diag/premature-ejaculation)

**Premature ovarian failure**
The loss of function of the ovaries before age 40.
Learn more at: [www.fertilitypedia.org/therapy/diag/premature-ovarian-failure](http://www.fertilitypedia.org/therapy/diag/premature-ovarian-failure)
**Prostatitis**
An inflammation of the prostate gland.
Learn more at: [www.fertilitypedia.org/therapy/diag/prostatitis](http://www.fertilitypedia.org/therapy/diag/prostatitis)

**Pyosalpinx**
A distally blocked Fallopian tube filled with pus.
Learn more at: [www.fertilitypedia.org/therapy/diag/pyosalpinx-do-rf](http://www.fertilitypedia.org/therapy/diag/pyosalpinx-do-rf)

**Recurrent miscarriage**
Three or more consecutive pregnancy losses before 20-24 weeks of gestation or below a fetal weight of 500 g.
Learn more at: [www.fertilitypedia.org/therapy/diag/recurrent-miscarriage](http://www.fertilitypedia.org/therapy/diag/recurrent-miscarriage)

**Renal cell carcinoma**
A kidney cancer that originates in a part of the very small tubes in the kidney that transport waste molecules from the blood to the urine.
Learn more at: [www.fertilitypedia.org/therapy/diag/renal-cell-carcinoma](http://www.fertilitypedia.org/therapy/diag/renal-cell-carcinoma)

**Repeated implantation failure**
The absence of implantation after three or more transfers of high quality embryos or after placement of 10 or more embryos in multiple transfers.
Learn more at: [www.fertilitypedia.org/therapy/diag/repeated-implantation-failure](http://www.fertilitypedia.org/therapy/diag/repeated-implantation-failure)

**Retrograde ejaculation**
The semen, which would normally be ejaculated via the urethra, is redirected to the urinary bladder.
Learn more at: [www.fertilitypedia.org/therapy/diag/retrograde-ejaculation](http://www.fertilitypedia.org/therapy/diag/retrograde-ejaculation)

**Rheumatoid arthritis**
A long-term autoimmune disorder that primarily affects joints.
Learn more at: [www.fertilitypedia.org/therapy/diag/rheumatoid-arthritis](http://www.fertilitypedia.org/therapy/diag/rheumatoid-arthritis)

**Salpingitis**
An acute inflammation of the fallopian tubes.
Learn more at: [www.fertilitypedia.org/therapy/diag/salpingitis](http://www.fertilitypedia.org/therapy/diag/salpingitis)

**Sertoli cell-only syndrome**
The absence of any developmental stage of sperm cell in the testes.
Learn more at: [www.fertilitypedia.org/therapy/diag/sertoli-cell-only-syndrome](http://www.fertilitypedia.org/therapy/diag/sertoli-cell-only-syndrome)
**Sinopulmonary infection**
An infection of the paranasal sinuses and/or the lungs, associated with several conditions of impaired fertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/sinopulmonary-infection](http://www.fertilitypedia.org/therapy/diag/sinopulmonary-infection)

**Sperm autoantibodies**
Antibodies that bind to sperm, inhibiting their movement, stopping recognition and entry into the egg.
Learn more at: [www.fertilitypedia.org/therapy/diag/sperm-autoantibodies](http://www.fertilitypedia.org/therapy/diag/sperm-autoantibodies)

**Sperm DNA fragmentation**
High level of DNA damage in sperm cells that may lead to male infertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/sperm-dna-fragmentation](http://www.fertilitypedia.org/therapy/diag/sperm-dna-fragmentation)

**Swyer syndrome**
A rare disorder characterized by a phenotypic female with an XY karyotype.
Learn more at: [www.fertilitypedia.org/therapy/diag/swyer-syndrome](http://www.fertilitypedia.org/therapy/diag/swyer-syndrome)

**Syphilis**
A sexually transmitted infection caused by the bacterium Treponema pallidum subspecies pallidum.
Learn more at: [www.fertilitypedia.org/therapy/diag/syphilis](http://www.fertilitypedia.org/therapy/diag/syphilis)

**Teratospermia**
Teratospermia is a condition characterized by the presence of sperm with abnormal morphology that affects fertility in males.
Learn more at: [www.fertilitypedia.org/therapy/diag/teratospermia](http://www.fertilitypedia.org/therapy/diag/teratospermia)

**Testicular atrophy**
A medical condition in which the testes diminish in size and may be accompanied by loss of function (production of sperm and testosterone).
Learn more at: [www.fertilitypedia.org/therapy/diag/testicular-atrophy](http://www.fertilitypedia.org/therapy/diag/testicular-atrophy)

**Testicular cancer**
Cancer that develops in the testicles.
Learn more at: [www.fertilitypedia.org/therapy/diag/testicular-cancer](http://www.fertilitypedia.org/therapy/diag/testicular-cancer)
**Testicular failure**
The inability of the testicles to produce sperm or testosterone.
Learn more at: [www.fertilitypedia.org/therapy/diag/testicular-failure](www.fertilitypedia.org/therapy/diag/testicular-failure)

**Testicular torsion**
Emergency medical condition occurring when the spermatic cord twists and cuts off the testicle's blood supply.
Learn more at: [www.fertilitypedia.org/therapy/diag/testicular-torsion](www.fertilitypedia.org/therapy/diag/testicular-torsion)

**Thyroid cancers**
Cancers that develop within the thyroid gland.
Learn more at: [www.fertilitypedia.org/therapy/diag/thyroid-cancers](www.fertilitypedia.org/therapy/diag/thyroid-cancers)

**Thyroid disorders**
A medical condition impairing the function of the thyroid.
Learn more at: [www.fertilitypedia.org/therapy/diag/thyroid-disorders](www.fertilitypedia.org/therapy/diag/thyroid-disorders)

**Traumatic penile injury**
Medical emergency that afflicts the human penis.
Learn more at: [www.fertilitypedia.org/therapy/diag/traumatic-penile-injury](www.fertilitypedia.org/therapy/diag/traumatic-penile-injury)

**Tubal ligation**
A permanent form of female sterilization, in which the fallopian tubes are severed and sealed or "pinched shut", in order to prevent fertilization.
Learn more at: [www.fertilitypedia.org/therapy/diag/tubal-ligation](www.fertilitypedia.org/therapy/diag/tubal-ligation)

**Tubal phimosis**
The type of blockage that affects the part of the fallopian tube end towards the ovary.
Learn more at: [www.fertilitypedia.org/therapy/diag/tubal-phimosis](www.fertilitypedia.org/therapy/diag/tubal-phimosis)

**Turner syndrome**
Turner syndrome is a genetic disorder in which a female is partly or completely missing one X chromosome that results in ovarian dysgenesis.
Learn more at: [www.fertilitypedia.org/therapy/diag/turner-syndrome](www.fertilitypedia.org/therapy/diag/turner-syndrome)

**Undescended testes**
In the case of cryptorchidism one or both testes are absent from the scrotum. It is is the most common etiologic factor of azoospermy in the adult.
Learn more at: [www.fertilitypedia.org/therapy/diag/undescended-testes](www.fertilitypedia.org/therapy/diag/undescended-testes)
**Unicornuate uterus**
Congenital uterine anomaly (one of the Müllerian duct anomalies) usually associated with communicating or non-communicating rudimentary horn.
Learn more at: [www.fertilitypedia.org/therapy/diag/unicornuate-uterus](http://www.fertilitypedia.org/therapy/diag/unicornuate-uterus)

**Unilateral fallopian tube blockage**
A condition of blocked passage through one of the Fallopian tubes.
Learn more at: [www.fertilitypedia.org/therapy/diag/unilateral-fallopian-tube-blockage](http://www.fertilitypedia.org/therapy/diag/unilateral-fallopian-tube-blockage)

**Uterine cancer**
womb cancer
Learn more at: [www.fertilitypedia.org/therapy/diag/uterine-cancer](http://www.fertilitypedia.org/therapy/diag/uterine-cancer)

**Uterine fibroids**
The most common benign smooth muscle tumors of the uterus encountered in women of reproductive age.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterine-fibroids](http://www.fertilitypedia.org/therapy/diag/uterine-fibroids)

**Uterine leiomyosarcoma**
Rare uterine malignant tumour that arises from the smooth muscular part of the uterine wall.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterine-leiomyosarcoma](http://www.fertilitypedia.org/therapy/diag/uterine-leiomyosarcoma)

**Uterine malformations**
A type of female genital malformation resulting from an abnormal development of the Müllerian duct(s) during embryogenesis.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterine-malformations](http://www.fertilitypedia.org/therapy/diag/uterine-malformations)

**Uterus duplex**
Congenital uterine malformation where both Müllerian ducts develop but fail to fuse, thus the woman has a "double uterus".
Learn more at: [www.fertilitypedia.org/therapy/diag/uterus-duplex](http://www.fertilitypedia.org/therapy/diag/uterus-duplex)

**Uterus septus**
A form of a congenital malformation where the uterine cavity is partitioned by a longitudinal septum. It is one of Müllerian duct anomalies.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterus-septus](http://www.fertilitypedia.org/therapy/diag/uterus-septus)
**Uterus subseptus**
A form of a congenital malformation where the uterus is partially divided by a longitudinal septum. It is one of Müllerian duct anomalies.
Learn more at: [www.fertilitypedia.org/therapy/diag/uterus-subseptus](http://www.fertilitypedia.org/therapy/diag/uterus-subseptus)

**Vaginismus**
A physical or psychological condition in which woman cannot engage in any form of vaginal penetration.
Learn more at: [www.fertilitypedia.org/therapy/diag/vaginismus](http://www.fertilitypedia.org/therapy/diag/vaginismus)

**Vaginosis**
A disease of the vagina caused by excessive growth of bacteria, with possible detrimental effect on female fertility.
Learn more at: [www.fertilitypedia.org/therapy/diag/vaginosis](http://www.fertilitypedia.org/therapy/diag/vaginosis)

**Varicocele**
An abnormal enlargement of the pampiniform venous plexus in the scrotum.
Learn more at: [www.fertilitypedia.org/therapy/diag/varicocele](http://www.fertilitypedia.org/therapy/diag/varicocele)

**XX male syndrome**
The male sex chromosomal disorder characterized by a spectrum of clinical presentations, ranging from ambiguous to normal male genitalia.
Learn more at: [www.fertilitypedia.org/therapy/diag/xx-male-syndrome](http://www.fertilitypedia.org/therapy/diag/xx-male-syndrome)

**Young's syndrome**
A rare condition causing chronic lung disease, rhinosinusitis and azoospermia.
Learn more at: [www.fertilitypedia.org/therapy/diag/young-s-syndrome](http://www.fertilitypedia.org/therapy/diag/young-s-syndrome)

⚠️ **Risk factors**

**Partial ovariectomy**
A surgery used to remove part of one ovary or part of both ovaries.
Learn more at: [www.fertilitypedia.org/therapy/rf/partial-ovariectomy](http://www.fertilitypedia.org/therapy/rf/partial-ovariectomy)
In vitro fertilization involves egg collection from the ovaries, fertilization in a petri dish, and the transfer of embryos into the uterus.

**Sources**

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