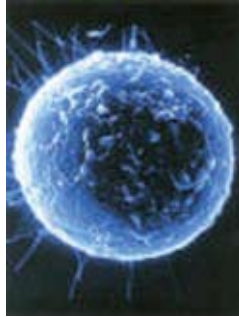




## MALE FERTILITY

The male reproductive system is designed to manufacture, store and transport sperm, the genetic cells that fertilise a woman's eggs. The hormones testosterone and follicle-stimulating hormone (FSH), regulate that process. Like sperm, testosterone is produced in both testicles, which are suspended in pouch-like skin sacs called the scrotum, located below the penis.



Sperm production begins when immature cells grow and develop within a network of delicate microscopic ducts called seminiferous tubules, inside the testicles. These new sperm cannot move initially on their own and are dependent on adjacent organs to become functional. They mature while travelling through the epididymis which is a coiled channel located behind each testicle.

When orgasm occurs, sperm are carried out of the body within seminal fluid secreted from various male reproductive glands, most notably the prostate and paired seminal vesicles.

### WHAT ARE THE CAUSES OF MALE INFERTILITY?

Developing and transporting mature, healthy, functional sperm depends on a specific sequence of events occurring in the male reproductive tract. Many disturbances can occur along that path, preventing cells from maturing into sperm production or reaching the woman's fallopian tube where fertilisation occurs.

Infertility may be caused by the testicles producing a decreased number of sperm. Abnormal sperm production can also be triggered by genetic factors and a number of lifestyle choices (e.g., smoking, alcohol, and certain medications), all of which impair the normal production of sperm cells, which, in turn, decreases their number. Long-term illnesses (e.g., kidney failure), childhood infections (e.g., mumps), and hormonal or chromosomal deficiencies (e.g., insufficient testosterone) can also account for abnormal sperm numbers.



The chances of fathering a child is non-existent if there are no sperm in the seminal fluid. Azoospermia (no sperm in the ejaculate) accounts for 10-15% of all male infertility. Azoospermia can be triggered by various hormonal or chromosomal deficiencies often linked to testicular failure, damage to the epididymis, vas deferens or ejaculatory ducts of the reproductive system, congenital or acquired problems such as infections.



Vasectomy is a primary example of an acquired factor causing azoospermia. By cutting and sealing the vas deferens to stop sperm from moving through the reproductive tract, pregnancy is prevented. Vasectomies can often be reversed (sperm may reappear in approximately 70% of men) however half of these men will develop high levels of sperm antibodies, which reduce the sperm's ability to fertilise an egg. Low success with vasectomy reversal is associated with high antibodies, the length of time since the vasectomy was performed and the amount of vas removed.

# MALE FERTILITY

A proper erection is essential in impregnating any partner. Impotence or erectile dysfunction (the inability to sustain an erection), is the most easily identified sexual problem linked to male infertility. Retrograde ejaculation, a lesser known issue, involves the improper deposit of sperm and semen. In this case, the ejaculate content may be normal, but instead of leaving the penis for the vagina, it flows backwards into the bladder due to an improperly functioning bladder neck.

Due to this varied range of fertility issues, sperm may need to be retrieved surgically. As the sperm retrieved in these methods is immature and unable to swim well to fertilise eggs, the sperm can only be used in conjunction with Intracytoplasmic Sperm Injection (ICSI) treatment.

## TYPES OF SURGICAL SPERM RETRIEVAL TECHNIQUES

### Testicular Sperm Aspiration (TESA):

Initially a diagnostic procedure in azoospermic men, it is now sometimes used to recover sperm from the testicles from men with obstructions or ejaculatory problems that cannot be treated by any other methods. A fine biopsy needle punctures the skin to aspirate sperm tissue directly from the testes. Sperm are then painstakingly dissected out of the tissue for use in the ICSI procedure.



**Percutaneous epididymal sperm aspiration (PESA):** PESA can be completed without a surgical incision. PESA is done under local or general anaesthesia with the Doctor inserting a needle attached to a syringe into the epididymis, then gently aspirating fluid. The epididymis is the structure into which the sperm first flow after developing and leaving the testes. Sperm may not always be obtained in this manner and the Doctor may have to perform an open procedure. This technique is used for men who have had a prior vasectomy and in those who have a congenital or acquired obstruction of the genital tract such as absence of the vas deferens. The sperm retrieved can only be used in conjunction with ICSI treatment.

### Microsurgical epididymal sperm aspiration (MESA):

Microsurgical epididymal sperm aspiration is an operative procedure used to obtain sperm by opening the ducts in the epididymis. MESA is performed in the operating room under local or general anaesthesia. This technique is used for men who have had a prior vasectomy and in those who have a congenital or acquired obstruction of the genital tract such as absence of the vas deferens. This technique is often performed when PESA has been unsuccessful. This sperm can only be used with ICSI treatment.

**Vibrostimulation/Electroejaculation:** Men with spinal cord injuries, neurological disorders and ejaculation problems can usually have vibrostimulation or electroejaculation procedures to retrieve sperm. The sperm can sometimes be used for artificial insemination but due to low sperm numbers, the samples usually can only be used for IVF or ICSI. Vibrostimulation is a procedure performed using a special vibrator applied directly to the penis to produce an ejaculation. Electroejaculation is a procedure whereby a special probe is inserted into the rectum to stimulate the pelvic nerves and cause ejaculation.

MFS17 0709



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