A man’s fertility and sexual characteristics depend on the normal functioning of the male reproductive system.

There are a number of individual organs in the male body that act together to make up the male reproductive system.

Some of the male sexual organs are visible, such as the penis and the scrotum, whereas some are hidden within the body. The brain also has an important role in controlling reproductive function.

As with other organs in the body, sometimes things go wrong and medical help is needed to correct the problem.

What are the testes?
The testes (testis: singular) are a pair of egg shaped glands that sit in the scrotum next to the base of the penis on the outside of the body. Each normal testis is 15 to 35ml in volume in adult men. The testes are needed for the male reproductive system to function normally.

The testes have two roles:
- Production of sperm
- Production of the male sex hormone, testosterone

Before birth, the developing testes move down from the abdomen into the scrotum. Successful descent of the testes is important for fertility as a cooler temperature in the scrotum is needed for sperm production and normal testicular function. The location of the testes in the scrotum keeps the testes about 2°C below normal body temperature.

Production of sperm
Sperm are made in the testes in a number of small, tightly packed, fine tubes called seminiferous tubules. These tubules have a total length of 150 metres.

Sperm production is a continuous process with millions of sperm being made each day after puberty.

Production of testosterone
Between the seminiferous tubules lies another cell type, Leydig cells. These cells, which produce the male sex hormone testosterone, lie close to blood vessels so that testosterone can move throughout the body in the blood.

What is the epididymis?
The epididymis is a highly coiled tube (duct) that lies at the back of the testes and connects the seminiferous tubules in the testis to another single tube called the vas deferens. The epididymis is about five metres long if stretched out. All sperm must pass through the epididymis when they leave the testis. When released from the testis, the sperm spend two to 10 days passing through the epididymis. During this journey, the sperm mature and gain the ability to move (swim or become motile).

What is the vas deferens?
The vas deferens is the tube that connects the epididymis to the urinary tract (urethra) at the back of the bladder, via the ejaculatory duct. The main job of the vas deferens and ejaculatory duct is to transport the mature sperm and seminal fluid (semen) to the urethra.

What is the ejaculatory duct?
The ejaculatory duct is a tube that is formed by the joining of the vas deferens and the duct of the seminal vesicle. The ejaculatory duct empties the mature sperm and semen into the urethra.

What is the prostate gland?
The prostate is a small, but important organ (or gland) found only in the male reproductive system. Its main role is to make fluid that protects and feeds sperm. The prostate makes about half of the fluid released from the penis when orgasm happens.

In young men, the prostate is about the size of a walnut (20g) and gets bigger as men get older. It sits underneath the bladder and surrounds the top part of the urethra, the tube which urine passes through on its way from the bladder to the penis. The growth of the prostate relies on testosterone (male sex hormone). If the prostate grows too large, it can slow or stop the flow of urine. As the prostate is located near the rectum (back passage), growth of the prostate can be checked by a rectal examination where a doctor places a gloved finger into the rectum.

What are the seminal vesicles?
The seminal vesicles are two small glands that sit directly above the prostate gland, attached to the vas deferens near the base of the bladder. These glands are very active and create a fluid that makes up about half of the fluid volume of the semen.
What are the Cowper’s glands?
The Cowper’s glands are pea-sized glands that sit near the prostate. The glands produce a fluid that is released before ejaculation to neutralise any urine that may be left in the urethra. The fluid also acts as a lubricant.

What is the scrotum?
The scrotum is a loose pouch of skin that hangs outside the body from the lower abdominal region behind the penis. The scrotum holds the testes in place.

What is the penis?
Used for urination and sexual intercourse, the penis is made up of two tubes of spongy tissue (corpora cavernosa) that enlarge with blood during erection. A tough fibrous, partially elastic outer casing surrounds this spongy material.

MALE HORMONES

What is the brain’s role?
The brain has an important role in controlling reproductive function. Both the hypothalamus and pituitary gland are involved in the control of male hormone production and sperm production. The hypothalamus is a small region that sits at the base of the brain and makes the hormone gonadotropin releasing hormone (GnRH). GnRH is important in controlling the secretion of other hormones from the pituitary gland. The pituitary gland, connected by a stalk to the hypothalamus, releases a number of messenger hormones that act as “keys” to activate different hormone-producing organs in the body including the testes.

What are hormones?
Hormones are chemical messengers produced by glands in the body and delivered through the bloodstream to act on other organs in the body. Male sex hormones, known as androgens, are sex steroids that increase at puberty and change a child to a sexually mature adult, who is able to reproduce.

What is testosterone?
Testosterone is the most important androgen or male hormone. It circulates in the bloodstream to act on a number of bodily functions and plays a vital role in reproductive and sexual function. Testosterone is needed for the physical changes (masculinization) that happen in young boys at puberty, including development of the genitals, beard and body hair, muscle gain, voice deepening, and other features of the adult male. The equivalent sex steroid produced by women is oestradiol.

Where is testosterone produced?
Testosterone is mainly produced in the testes. Small amounts of testosterone are also made by the adrenal glands, which are walnut sized glands that sit on top of the kidneys.

How is testosterone production controlled?
Luteinizing hormone (LH) and follicle stimulating hormone (FSH) are the two important messengers made by the pituitary gland in the brain to trigger testis function. Once set off by LH, the Leydig cells in the testes produce testosterone. Testosterone and FSH from the pituitary gland, act together on the sperm-producing tubes in the testes to stimulate the production of sperm.

How do hormones circulate in the bloodstream?
When testosterone is released into the bloodstream from the testes, only a small amount (two per cent) is free to act on various parts of the body. As testosterone travels through the body, it is metabolised (changed) into other sex steroids, “oestradiol” and “dihydrotestosterone” (DHT). Oestradiol, the female sex hormone, is important for maintaining bone health and avoiding osteoporosis. DHT is a powerful androgen that is made from testosterone in some parts of the body, such as the skin and the prostate. Eventually the liver breaks all of these sex steroids down.

Do testosterone levels change over the day?
Blood levels of testosterone vary across the day, with the highest levels early in the morning, and the lowest late in the evening.

For more information on male hormones, see Andrology Australia’s guide on Androgen Deficiency. Call 1300 303 878 for your free copy, or visit www.andrologyaustralia.org.