

## The Male Body

### What is the male reproductive system?

A man's fertility and sexual characteristics depend on the normal functioning of the male reproductive system. A number of individual organs act together to make up the male reproductive system; some 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.

### What are the testes?

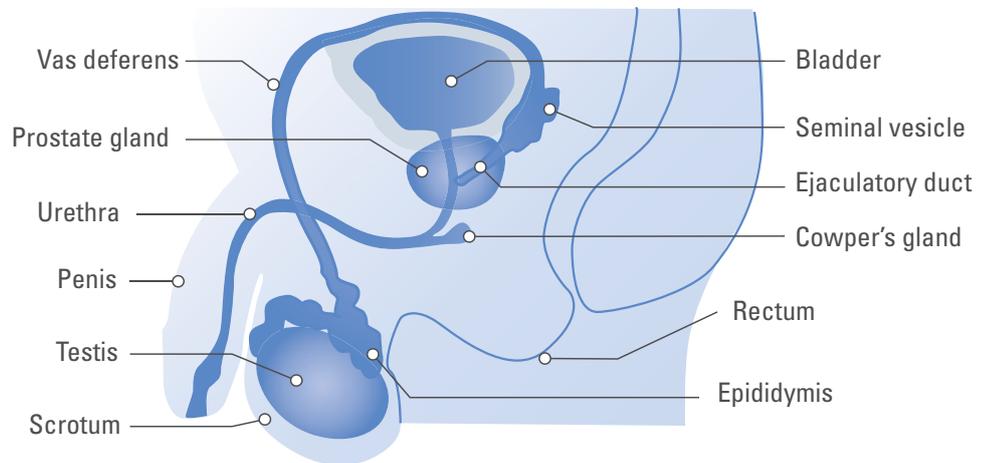
The testes (testis: singular) are a pair of egg shaped glands that sit in the scrotum next to the base of the penis on the outside of the body. In adult men, each testis is normally between 15 and 35 mL in volume. The testes are needed for the male reproductive system to function normally.

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The testes have two related but separate roles:

- to make sperm
- to make testosterone.

The testes develop inside the abdomen in the male fetus and then move down (descend) into the scrotum before or just after birth. The descent of the testes is important for fertility as a cooler temperature is needed to make sperm and for normal testicular function. The location of the testes in the scrotum keeps the testes about 2°C below normal core body temperature. This is the reason that in cold weather the scrotum contracts and brings the testes closer to the body and in hotter weather, the scrotum relaxes.



### What is the epididymis?

The epididymis is a thin highly coiled tube (duct) that lies at the back of each testis and connects the seminiferous tubules in the testis to another single tube called the vas deferens.

### What is the vas deferens?

The vas deferens is a muscular tube about 30 cm long 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 urethra?

The urethra is a tube that runs from the bladder to the end of the penis. It carries urine from the bladder to the outside of the body. In men, it also carries semen out of the body. The urethra is made up of two parts. The prostatic urethra is the part of the urethra that runs from the bladder through the prostate. The penile urethra is the part of the urethra that runs through the penis.

A ring of muscle called the internal

sphincter is located at the base of the bladder and when closed, it stops urine leaving the body through the urethra. At orgasm, this muscle ring closes tightly to stop sperm passing backwards into the bladder.

### What is the prostate?

The prostate is a small but important gland (organ) in the male reproductive system. The main role of the prostate is to make fluid that protects and gives nutrients to sperm. The prostate makes about one third of the fluid that is ejaculated (released) from the penis at orgasm (sexual climax).

### 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 more than 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 clear mucous 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 and

helps to keep the testes cooler than core body temperature.

## What is the penis?

Used for urination and sexual intercourse, the penis is made up of two erectile cylinders (corpora cavernosa) that enlarge with blood during erection. A tough fibrous, partially elastic outer casing surrounds the cavernosa. The corpus spongiosum surrounds the urethra (urinary tube), a tube that runs from the bladder to the end of the penis. The urethra carries urine and semen out of the body.

The head of the penis (glans penis) is covered by the foreskin in uncircumcised men.

## MALE HORMONES

### Why is the brain important for male reproduction?

The pituitary gland and the hypothalamus, located at the base of the brain, control the production of male hormones and sperm. The hypothalamus makes gonadotropin-releasing hormone (GnRH), which controls the release of other (messenger) hormones from the pituitary gland. The messenger hormones from the pituitary travel through the blood to act on the testes.

### What are hormones?

Hormones are chemical messengers made by glands in the body that are carried in the blood to act on other organs in the body. Hormones are needed for growth, reproduction and well-being.

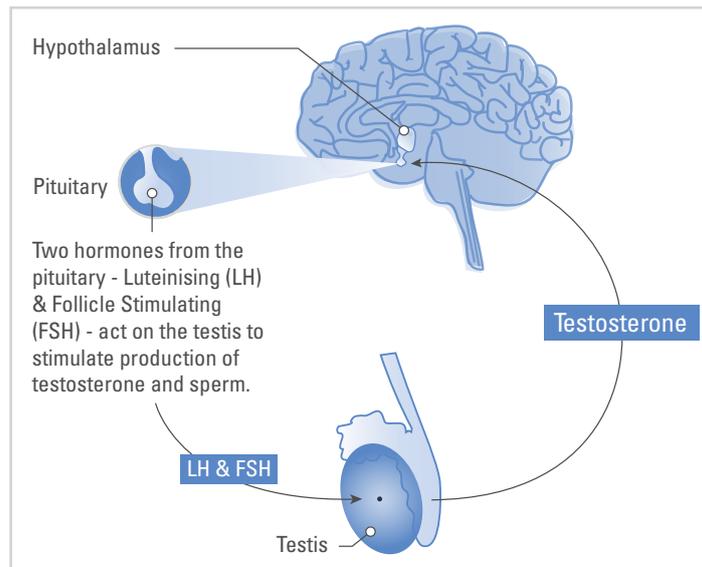
### What are androgens?

Androgens are male sex hormones that increase at puberty and are needed for a boy to develop into a sexually mature

adult who can reproduce.

## What is testosterone?

Testosterone is the most important androgen (male sex hormone) in men and it is needed for normal reproductive and sexual function. Testosterone is important for the physical changes that happen during male puberty, such as development of the penis and testes, and



## The brain plays an important part in the control of the male reproductive system

for the features typical of adult men such as facial and body hair and a masculine physique. Testosterone also acts on cells in the testes to make sperm. Testosterone is also important for overall good health. It helps the growth of bones and muscles, and affects mood and libido (sex drive). Some testosterone is changed into oestrogen, the female sex hormone, and this is important for bone health in men.

### Where is testosterone made?

Testosterone is mainly made in the testes. A small amount of testosterone is also made by the adrenal glands, which are walnut-sized glands that sit on top of the

kidneys.

## How do hormones control the testes?

The pituitary gland and the hypothalamus, located at the base of the brain, control the production of male hormones and sperm. The hypothalamus makes gonadotropin-releasing hormone (GnRH), which controls the release of other (messenger) hormones from the pituitary gland. Luteinizing hormone (LH) and follicle stimulating hormone (FSH) are the two important messenger hormones made by the pituitary gland that act on the testes to make testosterone and sperm.

## What happens to testosterone in the blood?

As testosterone moves through the body in the blood, it is changed or 'metabolised' into other sex hormones, 'oestradiol' and 'dihydrotestosterone' (DHT). Oestradiol, known as the female sex hormone, is also important for male bone health and preventing osteoporosis (thinning of the bones). DHT is a powerful androgen that is made from testosterone in some parts of the body, such as the skin and

the prostate.

## How do testosterone levels change over the day?

Blood levels of testosterone change across the day. The highest testosterone levels are early in the morning and the lowest levels are late in the evening. This pattern across the day is called a 'circadian rhythm' and happens normally in many of the body's hormonal systems. To standardise practice, the reference ranges for serum testosterone levels are taken in the morning. There is no cycle for men like the monthly female cycle.

## Expert reviewer

Professor Rob McLachlan, AM  
MBBS FRACP PhD  
Andrology Australia

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c/o School of Public Health and Preventive Medicine, Monash University  
553 St Kilda Road, Melbourne, Victoria 3004, Australia

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