



# Testosterone Deficiency

## What is testosterone?

Testosterone is the most important androgen (male sex hormone) in men and plays a key role in reproductive and sexual function. Testosterone is responsible for producing the physical characteristics of male puberty such as penis development and testicular growth, and for those features typical of adult men such as facial and body hair. Testosterone also stimulates cells in the testes to assist in the production of sperm.

In addition, testosterone is important for the good health of many non-reproductive tissues in the body. It plays an important role in the growth of bones and muscles, and affects mood, sex drive and certain aspects of mental ability.

## 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 that act to trigger testis function. Once stimulated with LH, the cells in the testes produce testosterone.

## What is testosterone deficiency?

Testosterone (or androgen) deficiency is when the body is unable to produce enough testosterone for the body to function normally. Although not a life-threatening condition, it can have a major affect on quality of life.

## How common is testosterone deficiency?

Testosterone deficiency affects about one in 200 men under 60 years of age. It is usually the result of genetic disorders (eg Klinefelter’s syndrome), damage to the testes (infection, trauma, medications, chemo/radiotherapy), undescended testes, or rarely, a lack of hormones produced by the brain (eg Kallman’s syndrome or disorders of the pituitary gland).

The number of men over 60 years who are testosterone deficient is uncertain with some estimates suggesting that one in 10 older men may have low testosterone levels. The ageing process, medical illnesses and obesity all affect testosterone levels.

## Do all men get low testosterone levels as they age?

Unlike women, whose oestrogen levels fall rapidly when they go through menopause, men’s testosterone levels fall much more gradually and over a longer period of time. Furthermore, not all men are affected by a drop in testosterone levels.

Testosterone levels in men are at their highest between the ages of 20 to 30 years; then testosterone begins to fall by about a third between the ages of 30 to 80 years.

Some men will experience a greater drop in these hormone levels. However, many men aged over 80 years will have relatively normal testosterone levels.

## Does “Male Menopause” exist?

Ageing men who have symptoms that have been associated with testosterone deficiency are sometimes described in the media as having “male menopause” or “andropause”. Terms such as these are not accurate. Menopause is the stopping of menstrual cycles (periods) which can only happen in women. Testosterone levels in men do not stop suddenly but slowly drop with age. Therefore, the hormonal changes associated with ageing in men and women are diagnosed and treated differently.

STAGE OF LIFE	POSSIBLE SYMPTOMS AND SIGNS
<b>Early Childhood</b>	<ul style="list-style-type: none"> <li>Penis and testes do not grow to expected size</li> </ul>
<b>Early teenage years (puberty)</b>	<ul style="list-style-type: none"> <li>Failure to go through full normal puberty</li> <li>Poor development of facial, body or pubic hair</li> <li>Poor muscle development</li> <li>Voice does not deepen</li> <li>Poor growth (height) surge</li> <li>Breast development</li> </ul>
<b>Adulthood</b>	<ul style="list-style-type: none"> <li>Mood changes (low mood and irritability)</li> <li>Poor concentration</li> <li>Low energy</li> <li>Reduced muscle strength</li> <li>Longer time to recover from exercise</li> <li>Low interest in sex (decreased libido)</li> <li>Difficulty getting and keeping erections</li> <li>Hot flushes, sweats</li> <li>Breast development</li> <li>Osteoporosis (thinning of bones)</li> <li>Low semen volume</li> <li>Reduced beard or body hair growth</li> </ul>
<b>Later life (after 60 years)</b>	<ul style="list-style-type: none"> <li>Easy fatigue</li> <li>Poor muscle strength</li> <li>Low mood and irritability</li> <li>Poor concentration</li> <li>Low interest in sex (decreased libido)</li> <li>Osteoporosis (thinning of bones)</li> <li>Difficulty getting and keeping erections</li> </ul>

## What are the symptoms and signs of testosterone deficiency?

The signs of low testosterone are different depending on the age when testosterone levels fall below the normal range. Many of the symptoms and signs are non-specific and may occur with other medical illnesses and in other circumstances (eg physical or psychological stress). Showing these symptoms therefore does not automatically mean that such men should have testosterone treatment.

## How is testosterone deficiency diagnosed?

A number of steps are involved in diagnosing testosterone deficiency:

- A full medical history and physical examination to confirm testosterone deficiency and to identify a possible cause;
- At least two blood samples on different days are taken to measure hormone levels. Blood is taken for testing in the morning as testosterone levels are highest at that time;
- Tests to determine the presence or absence of medical conditions known to affect the testes or pituitary gland (blood tests, chromosome testing, CT or MRI of the pituitary gland).

## What is the 'normal' testosterone reference range?

A reference range is used as a guide by testing laboratories and doctors to decide whether a man's hormone levels are considered normal or whether treatment is needed. Ninety-five per cent of healthy people have hormone levels that fall within a standard reference range. However, a few healthy people (5 per cent) have levels outside the range. The 'normal' testosterone reference range for healthy, young adult men is considered to be between about 8 and 27 nanomolar (approximately).

Guidelines for the use of testosterone have been developed, and the Pharmaceutical Benefits Scheme (PBS) uses these guidelines to decide when to subsidise the cost of testosterone therapy.

## How is testosterone deficiency treated?

Testosterone deficiency is treated by giving testosterone in doses that return the testosterone levels in the blood to normal. There are a number of forms of testosterone therapy available in Australia.

## What are the main forms of testosterone therapy?

Testosterone injections, implants, oral capsules, skin patches, creams and gels are available in Australia. Testosterone is prescribed for men with clinically proven lowered testosterone levels. Patient convenience, familiarity and cost can decide the type of treatment prescribed. Once started, this treatment is usually continued for life and needs to be checked regularly by a qualified doctor with monitoring of the prostate, blood count (haematocrit), cholesterol levels and bones (for osteoporosis).

## Who should NOT receive testosterone therapy?

The presence of other medical conditions may influence whether or not a man with testosterone deficiency should be treated with testosterone therapy. A particular concern of testosterone therapy is the potential worsening of prostate disease. Testosterone treatment should not be started in older men before the possibility of prostate cancer or severe non-malignant prostate disease has been considered. Men with breast cancer should also not receive testosterone therapy. Men with sleep apnoea or heart failure need a thorough assessment before being considered for testosterone replacement therapy.

Testosterone therapy should also not be used to treat low hormone levels caused by other treatable conditions, such as obesity or depression. These underlying problems should be corrected first as hormone levels may return to normal and testosterone therapy may never be needed.

## What are the side-effects of testosterone therapy?

Testosterone therapy can increase prostate growth, possibly making any prostate cancer, if present, worse. Testosterone should not be prescribed for men with prostate cancer. It may also make symptoms of prostate enlargement (benign prostatic hyperplasia, BPH) worse. Other side-effects such as mild acne, weight gain, breast development, male-pattern hair loss and changes in mood are uncommon.

## Can anything be done to prevent testosterone deficiency?

There are no known ways to prevent true testosterone deficiency caused by damage to the testes or pituitary gland. However, a healthy lifestyle and management of other health problems can improve testosterone production in men whose lowered hormone levels are due to other illnesses or conditions. Treatment should be directed towards these other illnesses in the first instance.

## For more information

For more detailed information, please call **1300 303 878** for Andrology Australia's free guide on androgen deficiency, or visit [www.andrologyaustralia.org](http://www.andrologyaustralia.org)

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