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# Testosterone & Testosterone Replacement Therapy



ORCHID   
FIGHTING MALE CANCER



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# Testosterone & Testosterone Replacement Therapy

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Testosterone is the male sex hormone. It is responsible for male sexual characteristics such as:

- **Deep voice**
- **Muscle tone**
- **Bone strength**
- **Hair pattern (and balding)**
- **Sex drive**
- **Achieving and maintaining erections**
- **General sense of male well-being**

# Purposes of testosterone

## Brain

Motivation  
Mood  
Sex Drive

## Bone Marrow

Red blood cell production  
Immune Function

## Bone

Bone density maintenance  
Prevents Osteoporosis

## Male Sex Organs

Sperm Production  
Erectile Function

## Cardiovascular

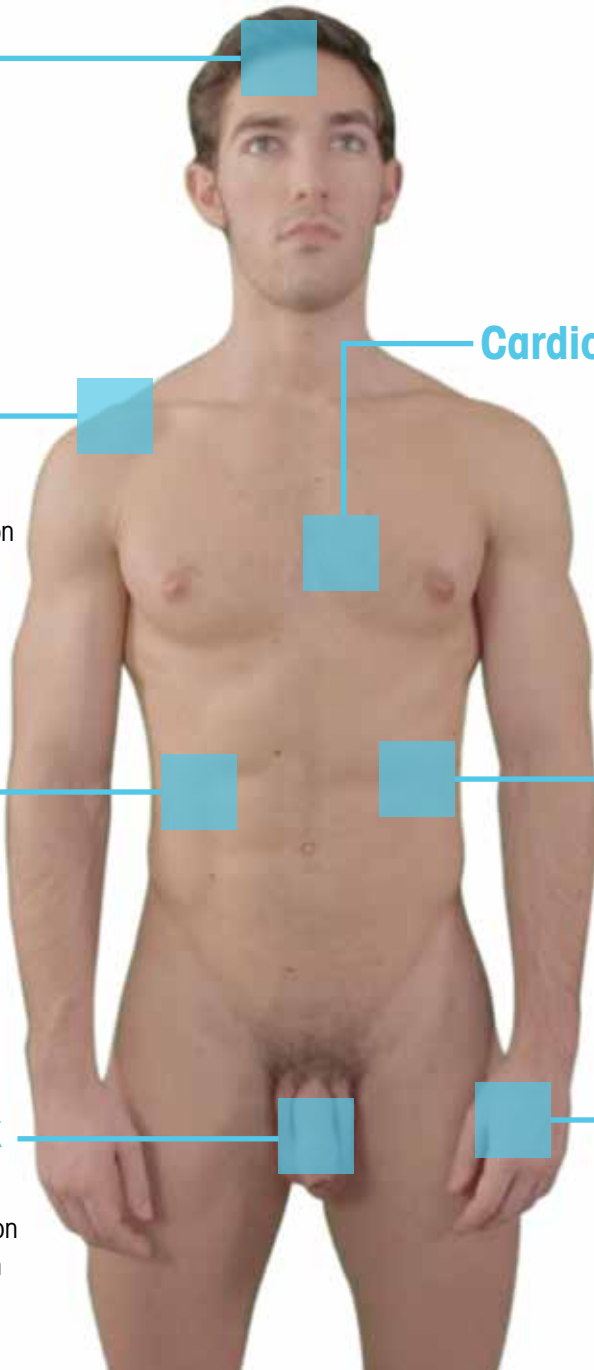
Energy  
Stamina

## Muscle

Muscle Mass & Strength  
Endurance

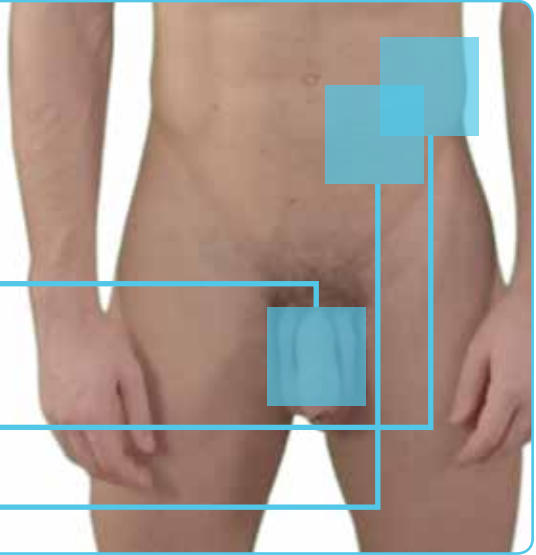
## Skin

Growth of facial and body hair



## Where is testosterone made?

90% of testosterone is made in the **Leydig cells** which line the testicles and produce sperm. A small amount is also produced in the **adrenal glands** which are situated at the top of the **kidneys**.



## How will I be affected by an orchidectomy?

Having a unilateral orchidectomy (one testicle removed) should not affect the overall circulating testosterone level in the body, providing the remaining testicle is healthy and can produce enough testosterone to make up for any deficit. However in some men such as those who have had, or are having chemotherapy, testosterone production in the remaining testicle may be affected. This is usually not permanent but it may take quite a while after treatment for testosterone levels to recover.

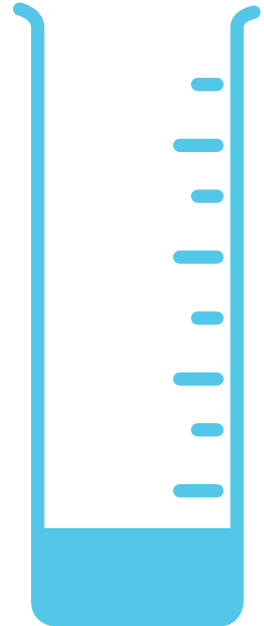
Alternatively, in men who have had a bilateral orchidectomy, the testosterone level will fall to a minimal level and in this situation men will need to start testosterone replacement therapy. After bilateral orchidectomy, the body will not be able to produce sperm and only very low levels of testosterone will be made from the adrenal glands.

## How will I know if my testosterone is low?

If testosterone levels fall men may feel tired, low or can develop hot flushes. Weight gain and a loss of muscle strength can also occur. These 'symptoms' can often be quite vague and difficult to recognise.

Much more specifically, if the testosterone levels are much lower than normal, men usually notice a loss of or difficulty in achieving normal erections on waking up in the morning, a fall in sex drive (loss of libido) and difficulty in maintaining erections strong enough for masturbation or sexual intercourse.

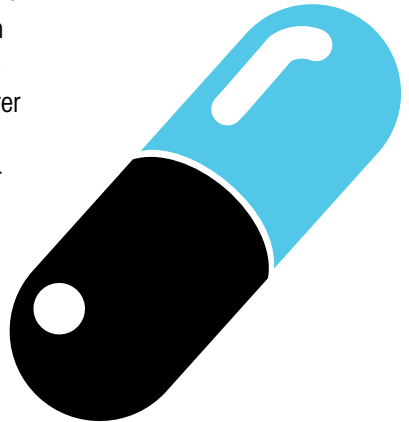
If testosterone levels are low for a prolonged time, breast swelling (gynaecomastia), thinning of the bones (osteoporosis) and an increase in cardiovascular disease can also occur.



## How else could I be affected by my treatment?

Because treatment for testicular cancer is intense and occurs in a fairly short space of time, men not only have to recover from the physical and mental strain of their illness but may find themselves struggling with the symptoms of low testosterone as well. Although low mood and sometimes depression can occur after testicular cancer treatment, men should consider asking their specialist team or GP to check them for possible testosterone deficiency.

A simple way of identifying potentially low testosterone levels is to have a blood test performed which can measure the level of testosterone that the body is producing.



# The blood test to measure testosterone levels

It is important that this particular blood test is performed in the morning. Testosterone levels are at their highest early in the morning, and this is when the blood test can be performed accurately. The results should only take a few days to be fully processed in most areas.

## What is the normal level?

A normal level of testosterone is usually considered to be between approximately 9 - 30 nmol/L (nanomoles per litre). A level below 8 nmol/L is considered to be low and the blood test should be repeated. If it is low on 2 occasions taken at the right time of the day, then men will usually benefit from starting testosterone replacement therapy.

Borderline levels are between 9 - 12 nmol/L and will often be monitored however treatment is not usually started in this range as it does not make a difference to how most people feel. However if men are displaying symptoms of low testosterone with a borderline level a trial for 6- months can be commenced to see if it helps resolve the symptoms.

If a man is worried that they may have a low testosterone level, they should speak to their consultant and specialist team who can arrange for men to be assessed for this problem and see a hormone specialist (endocrinologist).



# Types of testosterone replacement

## Type

### Gels (Testim®, Testogel®, Tostran®)

These are gels that are applied in a thin layer to a clean, dry and healthy area of skin such as the shoulders, chest or back, usually on a daily basis.

### Injections (Nebido®, Sustanon 250®, Virormone®)

Sustanon or virormone are given as an injection into the muscle of the buttocks (or the thickest part of the leg) every 2 weeks.

Nebido is an injection which will release testosterone into the body over a certain length of time and is called a depot injection. It is given deep into the muscle of the buttocks every 10-14 weeks. The injection is more oily and a little deeper so can be more uncomfortable.

Testosterone injections are usually given by GP practice nurses.

## Tips

These are applied daily, usually after a shower or bath, and you need to wait at least 5 minute before dressing afterwards.

It is very important that men wash their hands before and after use to avoid any transfer to their wife or partner, or if someone else applies it for you, they need to wear gloves to stop testosterone being absorbed into their system.

The injections themselves can be painful whichever form you are on, but this seems better if the vial is warmed up a few minutes before the injection is given.

Possible skin irritation or soreness can happen around the site of the injections.

Nebido tends to give very steady levels of testosterone.

Other testosterone injections lead to a rapid rise for the first week as the testosterone kicks in, then the levels usually fall off and you may feel it wear off completely before the next injection is due.

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**TYPE****TIPS**

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**Patches (Andropatch®, Intrinsa®)**

These are patches that can be applied to clean, dry skin like a nicotine patch.

Can cause skin irritation or reactions.

Not currently available in the UK.

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**Capsules (Restado®/Testocaps™)**

Three or four capsules are usually taken daily for the first 2-3 weeks, reduced to 1-3 capsules daily. they should be taken with a meal and swallowed, not chewed.

These provide much lower levels of testosterone than other preparations so may not be recommended.

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**Mucoadhesive Buccal tablets (Striant™ SR)**

These are tablets that are placed on the gum above the front teeth and dissolve gradually.

Buccal tablets can become dislodged from the gum.

Not currently available in the UK.

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## How do I know if the treatment is working?

If men start any of these treatments their testosterone levels will have to be checked on a regular basis to ensure a normal level is achieved. Most people start to feel better within a few weeks of treatment, but it may take at least 3 months to obtain a steady level in the blood stream and to feel the full effects of treatment.

If testosterone replacement therapy does improve a man's symptoms following treatment for testicular cancer then it can be continued indefinitely. In some men who have had a unilateral orchidectomy, testosterone levels may eventually return to normal and testosterone replacement therapy can be discontinued.

Some men may also find that it will take a little while to find the best treatment for them and may need to try different types of replacement therapy.



## Are there any side effects?



Although testosterone is commonly thought to cause aggression and hostility, it is more responsible for helping the body adapt to challenging and stressful events or situations.

However like all medications testosterone replacement therapy may cause some side effects and it is important to read the information supplied with any medication.

Common side effects are oily skin and spots. Less often, people complain of headaches, nausea, excess sweating, tiredness and mood changes.

Long term, doctors will need to perform safety monitoring to make sure that levels are within the normal range, and check that the testosterone has not affected the liver, blood count or prostate.

The prostate gland relies on testosterone to help it grow. This means that testosterone treatment can increase the size of the prostate. Testosterone does not cause prostate cancer, but can cause it to

progress, so treatment is not started in people who have active prostate cancer.

People at high risk of prostate cancer, or with a high prostate blood test (prostate specific antigen or PSA) may need to see a urologist to decide whether testosterone will be safe for them.

Safety monitoring with blood tests and an examination of the prostate is also necessary for everyone over 40.

It is extremely important that men do not take supplements of testosterone (such as those used in weight training, body building or available online) other than what has been medically prescribed. Too much testosterone can cause medical problems.

Testosterone levels should be measured on a regular basis and the dose adjusted if needed to keep these normal.

Men should not stop testosterone treatment without consulting their GP or specialist team.

# Tips

## Physical Exercise

Physical exercise is very good for improving energy levels; reducing anxiety and low moods as well as promoting feelings of general well-being. A few seconds sprinting can increase testosterone levels and graduated exercise such as brisk walking or supervised cardiovascular training may also help.

## Sleep

A good night's sleep can help increase testosterone levels naturally.

## Alcohol

Avoid excessive alcohol intake. Alcohol can lower testosterone levels.

## Stress

Avoid stressful situations. Practice relaxation techniques such as deep breathing or other natural ways to reduce your stress levels. Stress will lower testosterone levels.

## Diet

Try and eat a healthy mixed diet and keep to a healthy weight. Being overweight leads to a fall in testosterone.

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