Information for Patients

English

Male Hypogonadism

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Patient Information

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This information was last updated in March 2018.

This leaflet is part of EAU Patient Information on male hypogonadism. It contains general information about this condition. If you have any specific questions about your individual medical situation you should consult your doctor or other professional healthcare provider. No leaflet can replace a personal conversation with your doctor.

This information was produced by the European Association of Urology (EAU) Patient Information Working Group, March 2017.

Dr. M. Sochaj Gorzow Wielkopolski (PL)
Dr. Y. Tanidir Istanbul (TR)

The content of this leaflet is in line with the EAU Guidelines on Male Hypogonadism 2016.

You can find this and other information on urological diseases at our website: http://patients.uroweb.org

Male Hypogonadism

What is male hypogonadism?

Male hypogonadism means the testicles do not produce enough of the male sex hormone testosterone. When levels are low, men might have decreased sex drive, less muscle mass, erectile dysfunction, and fatigue.

Hypogonadism has a negative effect on organ function and quality of life. Testosterone is responsible for male reproductive and sexual functions. It affects puberty, fertility, muscle mass, body composition, bone strength, fat metabolism, sex drive, mood and mental processes (**Fig. 1**).

Testosterone is an androgen. Production of androgens decreases slightly with age. Low levels are more common in men who are obese and have multiple health conditions.

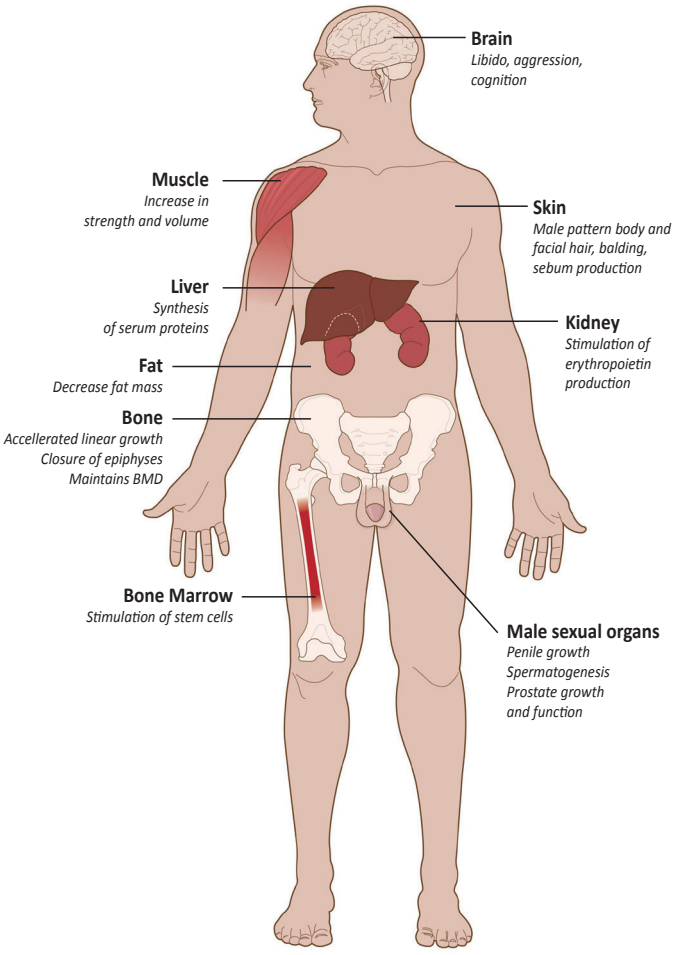

Fig. 1: testosterone: target organs.

Testosterone production

Testosterone is produced mainly in the testicles and also by the adrenal glands. Women have testosterone, but in much smaller amounts than men.

In the brain, the hypothalamus and pituitary gland help the testicles produce testosterone. They produce hormones that prompt action in the testicles. In response, the testicles produce sperm and testosterone.

What does testosterone do?	
Brain	Affects sex drive, mood, and mental processes (cognition)
Skin	Affects male pattern body and facial hair, balding, and oil production
Larynx	Deepens voice and prompts formation of Adam's apple
Kidney	Stimulates production of erythropoietin, which causes red blood cells to form
Male sexual organs	Affect penile and prostate growth and function and production of sperm
Muscle	Increases strength and muscle mass
Liver	Affects production of proteins
Fat	Decreases fat mass
Bone marrow	Stimulates production of stem cells
Bone	Accelerates growth, increases bone strength, and maintains bone density

Types and causes of hypogonadism

Primary hypogonadism is caused by a problem in the testicles. This type is most frequent and usually affects development in childhood and adolescence. Secondary hypogonadism is caused by a problem in glands that tell the testicles to make testosterone. This type is more common among older men.

Symptoms

Hypogonadism can occur at any age. The symptoms will be different depending on your age when it develops. Common symptoms in adult men include:

- Fatigue
- Hot flushes
- Low sex drive

* The underlined terms are listed in the glossary.

- Erectile dysfunction
- Mood changes
- Difficulty concentrating
- Problems sleeping
- Loss of muscle mass
- Decreased bone density
- Enlarged breasts
- Loss of body hair
- Infertility

Older men with low hormone levels may have low sexual desire and activity, erectile dysfunction, and hot flushes. In men with normal testosterone levels, these symptoms can be caused by other conditions.

Diagnosis

Male hypogonadism is diagnosed based on:

- Long-term discomfort from symptoms
- Low testosterone levels in the blood measured at least two separate times

Your doctor might refer you to a hormone specialist (endocrinologist) if hypogonadism is suspected.

Physical examination

A physical exam will look at your body hair, muscle mass, and testicles. Your doctor will make sure they are consistent with your age. Your doctor will also take a medical history to assess your general health.

Questions may include:

- When did your symptoms begin?
- Do they stop and start or happen all the time?
- Does anything make them better or worse?
- Have your testicles been injured in the past?
- Did you have undescended testicles as a child?
- When did you go through puberty?

If you are an adult patient, the doctor will also ask about your sexual life.

Blood test

If you have symptoms of hypogonadism, your doctor will take blood to test your testosterone level. Blood should be drawn in the morning before breakfast. This test should be done at least two separate times.

Additional tests

If both tests confirm you have low testosterone, further testing can determine whether the cause is testicular (primary hypogonadism) or pituitary (secondary type).

Common causes of hypogonadism

Primary (testicular)	Secondary (pituitary)
• Abnormal development of the testicles due to genetic problems (Klinefelter syndrome) • Undescended testicles • Mumps infection involving the testicles • Too much iron in the blood • Injury of the testicles • Treatment for testicular cancer	• Abnormal development of the hypothalamus (Kallmann syndrome) • Pituitary disorders • Inflammatory disease that involves the hypothalamus and pituitary gland • HIV/AIDS • Medications that affect hormone production • Untreated sleep apnoea • Obesity • Normal aging* • Physical stress related to an illness or surgery • Significant emotional stress • Inherited from family

** Decreased testosterone varies greatly among men. Almost a third of men older than age 75 have low testosterone.*

Hypogonadism in childhood

Hypogonadism can develop at any age but affects young children, adolescent boys, and men differently. It has little impact on young children and may well go away over time. In contrast, low hormone levels at puberty can affect a boy's sexual development.

Adolescent boys with hypogonadism typically have undeveloped muscles and genitals, a high-pitched voice, and little or no body hair. Breasts may form, and arms and legs may become out of proportion to a small torso as they continue to grow.

In most cases, a delay in development is normal and will correct itself, although the wait may be emotionally and socially difficult.

Check for hypogonadism if a boy:

- Shows symptoms of hypogonadism
- Has male family members who had hypogonadism
- Has hormone levels that decrease, indicating Klinefelter syndrome
- Has had injuries, infections, or medical treatments that can affect hormone levels

* The underlined terms are listed in the glossary.

Tests to determine type of hypogonadism	
Surgery	The testicle is removed (orchiectomy)
Additional blood tests	Other conditions can cause the same symptoms as hypogonadism. Bloods tests will also assess levels of: • Hormones produced by the pituitary gland (pituitary function) • Iron (anaemia) • The hormone prolactin, which causes breast growth (gynecomastia) • Thyroid hormones (thyroid function)
Imaging	MRI or CT scan may be used to check for tumours in the pituitary gland
Genetic testing	Some types of hypogonadism are caused by problems in the way the genes developed. These tests can check for genetic causes of low hormone levels.

Treatment of hypogonadism

Losing weight, adjusting your diet, stopping smoking, and increasing exercise can improve your quality of life with hypogonadism. These changes can also help increase muscle strength and improve diabetes control and sexuality.

Hormone replacement therapy is the main treatment for hypogonadism. Different hormones are used depending on the type of hypogonadism. Hormone therapy may be combined with treatment of other symptoms for relief. Tumours found in the pituitary gland may require surgery, medication, radiation, or replacement of other hormones.

Hormone replacement

The goal of hormone replacement is to improve quality of life, sense of well-being, sexual function, muscle strength, and bone mineral density.

Testosterone replacement aims to restore hormone levels in men diagnosed with low testosterone caused by testicular problems (primary hypogonadism).

Pituitary hormone replacement may be used if low levels are caused by a pituitary problem (secondary hypogonadism). Pituitary hormones can stimulate genital development in boys. They can increase sperm production and restore fertility in men.

Types of testosterone replacement therapy

Different types of testosterone replacement are absorbed into the body differently and have different side effects. Consider starting therapy with a type that can be stopped easily (short-acting treatment) if side effects are a problem. Not all types of testosterone replacement therapy are available in all countries. Work with your doctor to choose the right type of testosterone replacement therapy for you.

Types of testosterone replacement therapy		
Type	**Formulation**	**Side effects**
Taken by mouth	Short-acting: testosterone undecanoate pills, sublingual testosterone (tablet placed under the tongue to dissolve) buccal testosterone tablet (swallowed)	Widely used with few or no side effects. Safe when used for a limited time.
Injected into the buttock or arm	Short-acting: testosterone cypionate and enanthate (every 2–3 weeks) Long-acting: testosterone undecanoate (every 3 months), subdermal depot (patch placed under the skin releases medicine over 5–7 months)	Short-acting injections can cause testosterone levels to vary, sometimes too high and sometimes too low. This may cause symptoms to appear and disappear during treatment.
Applied to skin	Short-acting: transdermal testosterone patch or gel Long-acting: subdermal depot (patch injected under the skin releases medicine over 5–7 months)	Short-acting treatment can cause skin to become irritated. Medicine can be transferred accidentally to another person who comes into contact with it. Long-acting treatment can cause skin infection. The implanted patch has a 10% chance of coming out unexpectedly.

Do not use testosterone replacement therapy if you have:

- Heart problems
- Prostate cancer
- An enlarged prostate that causes problems urinating
- Male breast cancer
- A high red blood cell count
- Severe sleep apnoea
- Infertility but might want to have children

* The underlined terms are listed in the glossary.

Risks of testosterone treatment

In addition to side effects, hormone replacement carries some risks related to natural changes in hormone levels. Testosterone replacement can cause both cancerous and non-cancerous prostate tumours, enlarged breasts, infertility, and blood clots in the veins.

Hypogonadism and fertility

Hypogonadism can reduce sperm production and cause infertility. Men who want to have children should not use testosterone replacement, but other treatment may be available.

Men with hypogonadism caused by pituitary problems (secondary type) can potentially be treated with a hormone called human chorionic gonadotrophin, or hCG. This hormone stimulates production testosterone in the testicles. This therapy can be used only for a limited time and should be guided by a competent specialist.

Men with hypogonadism caused by problems in the testicles (primary type) who have fertility problems need evaluation of the testicles and may require assisted reproductive technology. This technology can help couples who have not been able to conceive a child.

Follow-up

Regular medical monitoring is recommended during treatment. Your doctor will schedule visits with you to assess whether treatment is working, address possible side effects, and check treatment safety. Your testosterone will be tested over time to help determine the right dosage for therapy. Follow-up may include blood tests, examination of your prostate and your heart, and bone density scans.

With treatment, your symptoms will go away gradually. For example, your sex drive might improve first, then your mood might improve, and then erectile function might return.

Support

For most adults with hypogonadism, the condition is lifelong and treatment is ongoing. The goal is to improve quality of life, sense of well-being, sexual function, and muscle and bone strength. Hormone replacement combined with weight loss, a healthy diet, stopping smoking, and increasing exercise can help.

Glossary of terms

Androgen
Group of steroid hormones, represented mainly by testosterone

Erectile dysfunction
The inability to get or keep an erection

Hypothalamus
Small organ at the base of the brain that links the nervous system with the endocrine system through the pituitary gland

Infertility
When a couple that has unprotected intercourse for a period of 2 years cannot conceive a baby

Mumps infection
A contagious viral infection of the salivary gland with fever, headache, and swelling of the salivary gland in the cheeks

Pituitary gland
Small endocrine gland in the brain that is connected to the hypothalamus and secretes a variety of hormones

Sex hormones
Hormones that determine the appropriate sex characteristics; testosterone is the main sex hormone in men

Sleep apnoea
Sleep disorder characterised by shallow breathing or pauses in breathing

Testicles
Male sex gland with the main function of producing sperm and androgens

Testosterone
Sex hormone produced mainly by the testicles that stimulates the development of sex organs and takes part in proper maintenance of muscle, bone, brain, and other organs in men

European Association of Urology
PO Box 30016
NL-6803 AA ARNHEM
The Netherlands

e-Mail: info@uroweb.org
Website: patients.uroweb.org

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