

Testosterone Therapy and General Health

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Please keep in mind while reading this section that the reference values/ranges listed for various blood tests may vary slightly from lab to lab. Always be sure to discuss test results with your doctor.

I. INTRODUCTION

As with most medications and supplements-- even hormones such as testosterone-- adding exogenous doses will have an effect on overall health and balance of systems in the body. While testosterone has many beneficial effects for trans men, there are health issues that may arise from testosterone usage that should be monitored carefully by you and your doctor.

This chapter is divided into four sections. First is a short overview of testosterone delivery methods. Second is a summary of the type of laboratory tests your doctor will use to monitor your health, as well as the general range of test values you should expect from such tests. Third is a list of potential health complications and issues that may arise when using testosterone. Fourth is a list of other health issues to consider with testosterone use. This information is provided as a starting point, so that you may be aware of potential problems and speak to your doctor intelligently regarding your health.

Overview of testosterone delivery methods

Testosterone therapy, testosterone (often called "T" for short) can be administered into the body in a number of ways. The most common method is intramuscular injection with a syringe. Other delivery methods include transdermal application through a gel, cream, or patch applied to the skin; orally by swallowing tablets (this method is uncommon, as oral delivery of C-17 alpha alkylated testosterone has been associated with negative effects on the liver); sublingually/buccally by dissolving a tablet under the tongue or against the gums; or by a pellet inserted under the skin. The T delivery method used will depend on the type of medication available in the country of treatment, the health risks/benefits for the patient, personal preference, and cost.

Testosterone is not stored by the body for future use, so in order to maintain healthy levels it must be administered in timed intervals and in appropriate dosages. Injectable and subcutaneous T pellets remain active in the body the longest. Injectable T is typically administered between once a week to once every three weeks, and subcutaneous T pellets are replaced every 3-4 months. Transdermal T (patch, gel, or cream) is typically applied to the skin in smaller daily doses; oral and sublingual/buccal T are also typically taken daily. ([For more information on different types of testosterone and dosages, click here.](#))

II. IMPORTANT LAB TESTS

In order to monitor your health while taking testosterone, your doctor will perform a variety of tests in the laboratory-- mostly blood tests. During the first year of testosterone therapy, your doctor should perform blood tests every three or four months. This will be especially helpful in determining an appropriate T dose, as the data found in the blood tests can be used to adjust your dosage and/or timing if necessary. If no major problems arise in your bloodwork during the first year of treatment, blood tests can be taken

every six months during the second year. Once into the third year of treatment, blood tests can be performed once per year if no complications arise.

Some of the important lab tests that your doctor should perform are listed below. **Please keep in mind while reading this section that the reference values/ranges listed for various blood tests may vary from lab to lab. Always be sure to discuss test results with your doctor.** Also remember to ask your doctor if there are any special preparations for a specific test (such as fasting beforehand or drinking plenty of fluid), and be sure to tell your doctor about all medications and supplements you may be taking, as these factors may effect the test results.

Serum total testosterone test

An individual's testosterone levels are usually confirmed through a blood test called a "serum total testosterone test." Testosterone exists in your bloodstream in two forms-- "bound" testosterone and "free" testosterone. The majority of bound testosterone in the body is chemically bound to a protein called "sex hormone binding globulin" (SHBG). The remaining bound testosterone in the system is mostly bound to albumin, another protein. Free testosterone is not chemically attached to any proteins and is considered the "active" form of testosterone, as it is readily available to bind to androgen receptor sites on cells.

A serum total testosterone test measures the total of bound and free T in the system. What is considered a normal test level of combined bound and free testosterone in male bodies can range anywhere from 300-1100 ng/dl (nanograms per deciliter). Levels will vary with age and individual factors.

It is useful to also separately measure the level of free testosterone in the system, as this may be more indicative of how hormone therapy is progressing. Levels of free testosterone can range between 0.3%-5% of the total testosterone count, with about 2% considered an average level. Ask your doctor to check for both total and free levels of testosterone in your system.

Remember that because every body has a different sensitivity to androgens, T levels themselves will not necessarily indicate results in terms of masculinization. The levels are merely a guideline by which you and your doctor can begin to measure progress. Your results and your dosing should be guided by your overall health (especially the health of your heart and liver), your progress in masculinization, and how your body and moods react to different dosages. Testosterone therapy is not a one-size-fits-all approach--be sure to monitor your health and feelings closely, and remember that even a small adjustment in dosage (in either direction) can make a big difference. Your doctor should rely on the tests below to monitor your overall health.

Complete blood count (CBC)

A complete blood count (CBC) test usually measures the following:

- * Number of red blood cells (RBCs)
 - * Number of white blood cells (WBCs)
 - * Total amount of hemoglobin (HGB) in the blood
 - * The fraction of the blood composed of red blood cells (hematocrit or HCT)
 - * The mean corpuscular volume (MCV-- the size of the red blood cells, derived from $MCV = HCT/HGB$)
- (The platelet count is often also included)

Values for males, where different from females, are noted below. Keep in mind that the reference levels/values listed for tests may vary from lab to lab.

RBC (males): 4.7 to 6.1 million cells/ul (cells per microliter)

WBC: 4,500 to 10,000 cells/ul

Hemoglobin (males): 13.8 to 17.2 gm/dl (grams per deciliter)

Hematocrit (males): 40.7 to 50.3%

MCV: 80 to 95 femtoliter

(Please note that RBC, hematocrit, and hemoglobin levels can also vary by altitude.)

Of the levels listed above, RBC, hemoglobin, and hematocrit should be monitored closely during testosterone therapy. Those levels will be discussed below in further detail.

Red blood cell (RBC) count

Red blood cells, or "erythrocytes," transport hemoglobin. Hemoglobin transports oxygen to body tissues. RBCs normally survive about 120 days in the blood, after which they are removed by the spleen and liver.

Reference values for RBCs in males: 4.7 to 6.1 million cells/ul (cells per microliter)

Testosterone has been reported to stimulate the production of red blood cells. For trans men, RBCs will typically be raised into the male range, but ideally should not be raised past the high end of that range.

Hemoglobin (HGB)

Hemoglobin, as mentioned above, is a protein that carries oxygen in the blood. It also carries carbon dioxide from the tissues to the lungs to be exhaled. HGB is contained in red blood cells.

Reference values for HGB in males: 13.8 to 17.2 grams/dl (grams per deciliter)

Testosterone has been reported to stimulate the production of HGB. For trans men, HGB levels will typically be raised into the male range, but ideally should not be raised past the high end of that range.

Hematocrit (HCT)

The hematocrit is the percentage of whole blood that is composed of red blood cells. It is a measure of both the number of RBCs as well as their size. HCT indicates the proportion of cells and fluids in the blood-- when HCT levels are too high, the blood is becoming too thick, which can cause a variety of complications.

Reference values for HCT in males: 40.7 to 50.3% of the blood.

As testosterone has been reported to stimulate the production of RBCs, it also can raise the HCT level. For trans men, the HCT percentage will typically be raised into the male range, but ideally should not be raised past the high end of that range.

Liver function tests (LFT)/Liver enzymes

There are a number of blood tests that are used to evaluate liver function. Such tests measure the levels of certain enzymes and/or other substances in the blood, the presence of which may indicate damage to the liver or other vital tissues. Because liver health can be affected by the use of testosterone (and because testosterone is metabolized in the liver), your doctor may monitor your "liver enzymes" or "liver levels" using some or all of the tests listed below.

Common tests that measure for specific enzymes include: **AST** (aspartate aminotransferase, sometimes also called SGOT), **ALT** (alanine aminotransferase, sometimes also called SGPT), **ALP** (alkaline

phosphatase), and **GGT** (gamma glutamyl transferase). Other tests that are used to evaluate liver function include: **Albumin**, **Bilirubin**, and **PT** (Prothrombin time, an evaluation of clotting in the blood).

Details of these tests are listed below. Keep in mind that the reference levels/values listed for tests vary from lab to lab.

Aspartate aminotransferase (AST)

(Also sometimes called serum glutamic-oxaloacetic transaminase [SGOT])

Aspartate aminotransferase (AST) is an enzyme found in high concentrations in the red blood cells, the liver, heart cells, and muscle tissue, and in lesser concentrations in the pancreas, the kidneys, and other tissues. When body tissue or an organ such as the heart or liver is compromised, additional AST is released into the bloodstream. The amount of AST found in the blood is directly related to the extent of the tissue damage. AST is often measured in combination with other enzyme levels such as ALT and ASP to monitor liver disease.

Strenuous exercise can affect aspartate aminotransferase (AST) test results; avoid strenuous exercise just before having this test done. Some drugs and supplements can also interfere with the results of this test. Speak with your doctor about all medicines you may be taking, including vitamins and herbal supplements.

Reference values for AST: 0 to 35 IU/l (international units per liter)

Keep in mind that abnormal levels for this test may arise from a variety of different causes, and cannot automatically be assumed to be caused by liver disease.

Alanine aminotransferase (ALT)

(Also sometimes called serum glutamate pyruvate transaminase [SGPT])

Alanine aminotransferase (ALT) is an enzyme involved in the metabolism of alanine, an amino acid. ALT is present in a number of tissues but is in highest concentration in the liver. If the liver is injured, ALT is released into the blood.

Reference values for ALT: 5 to 35 IU/l (international units per liter)

Normal range can vary according to a number of factors, including age, race, and sex. Consult your physician or lab for interpretation.

Alkaline phosphatase (ALP)

Alkaline phosphatase (ALP) is an enzyme found in all tissues, but is found in particularly high concentrations in the liver, the bile ducts, placenta, and bone.

Damaged or diseased tissue releases ALP into the blood. ALP levels in the blood may also increase in some normal circumstances or in response to a variety of drugs. There are multiple types of ALP, each with a different structure, called isoenzymes. Different isoenzymes are found in different tissues. In order to differentiate the location of damaged or diseased tissue in the body, ALP isoenzyme testing must also be done in the laboratory.

Reference values for ALP: 30 to 120 IU/l (international units per liter).

Normal values can vary with age and sex. Consult your physician or lab for interpretation.

Gamma glutamyl transferase (GGT)

GGT is active in the transfer of amino acids across cellular membranes and in glutathione metabolism. High concentrations of GGT are found in the liver, the bile ducts, and the kidney.

GGT is usually measured in combination with other liver enzyme levels such as ALP. Comparison between the enzyme levels is useful in differentiating liver or bile duct disorders from bone disease.

Reference values for GGT: 0 to 51 IU/l (international units per liter)

Normal values for this test vary widely, and depend on the age and sex of the individual. Consult your physician or lab for interpretation.

Albumin

Albumin is a protein that transports many small molecules in the blood, including bilirubin, calcium, progesterone, and drug chemicals. It also helps maintain the oncotic pressure of the blood.

Albumin is synthesized by the liver; decreased serum albumin may result from liver disease. It can also result from kidney disease, malnutrition, or a low protein diet.

Reference values for albumin: 3.4 to 5.4 g/dl (grams per deciliter)

Bilirubin

Bilirubin is a breakdown product of hemoglobin. Red blood cells contain hemoglobin, which is broken down into the components "heme" and "globin." Heme is converted into bilirubin. Albumin carries bilirubin to the liver, where most of it is conjugated with a glucuronide before it is excreted in the bile. Conjugated bilirubin is called "direct bilirubin;" unconjugated bilirubin is called "indirect bilirubin." Total bilirubin equals direct bilirubin plus indirect bilirubin.

Total and direct bilirubin are usually measured to screen for liver disease or gall bladder/bile duct dysfunction.

Reference values for total bilirubin: 0.1-1.0 mg/dl (milligrams per deciliter)

Reference values for indirect bilirubin: 0.2-0.8 mg/dl

Reference values for direct bilirubin: 0.1-0.3 mg/dl

Prothrombin time (PT or Pro-time)

This is a test that measures the clotting time of plasma (the liquid portion of the blood).

Blood clotting involves several proteins known as "coagulation factors," which are individually numbered with roman numerals (i.e., Factor I, Factor II, Factor V, Factor X, etc.) The liver produces these proteins and secretes them into the blood. Blood clotting begins when some of the coagulation factors contact damaged tissue. Each factor reaction triggers the next reaction, in a cascade. The final product of the coagulation cascade is the blood clot.

The PT test measures the clotting ability of factors I (fibrinogen), II (prothrombin), V, VII, and X. When any of these factors is deficient, the PT is prolonged. In addition to screening for clotting/bleeding disorders, the PT test can also be an indicator of liver and bile duct disease.

Reference values for PT: 9 to 12 seconds

Normal values will vary somewhat in different labs, and will be higher for individuals on anticoagulant therapy.

Testosterone has been reported to suppress clotting factors II, V, VII, and X. As the PT test is a measure of the clotting ability of those specific factors as a group, it is an important screening test for those individuals taking testosterone.

Clotting factors test

Additional clotting factor testing is usually done as a follow-up to an abnormal Prothrombin time (PT) test. In clotting factor testing, the suspected coagulation factor deficiencies are further tested individually. Functional (activity) testing and quantity (antigen) testing can help determine which factor(s) are affected and how severely. Antigen testing is not available for all the clotting factors.

Lipid profile tests (Cholesterol, Triglycerides)

The lipid profile is a group of tests that help determine risk of coronary heart disease. It includes total cholesterol, HDL cholesterol (High Density Lipoprotein or "good" cholesterol), LDL cholesterol (Low Density Lipoprotein or "bad" cholesterol), and triglycerides.

Cholesterol

Cholesterol is a soft, waxy substance present in all parts of the body including the nervous system, skin, muscle, liver, intestines, and heart. It is both made by the body and obtained from certain foods. Cholesterol is manufactured in the liver and is transported in the blood to body tissues.

Cholesterol measurements are typically broken down into three categories: HDL cholesterol (often called "good cholesterol"), LDL cholesterol (often called "bad cholesterol") and total cholesterol. The lower your LDL cholesterol, the lower your risk of heart attack and stroke. It is also important to maintain a high enough level of HDL, or "good" cholesterol. Desirable cholesterol levels, according to the American Heart Association, are listed below.

Levels for Total cholesterol:

Desirable: less than 200 mg/dl (milligrams per deciliter)
Borderline high risk: 200 to 239 mg/dl
High Risk: 240 mg/dl and above

Levels for LDL cholesterol:

Optimal: less than 100 mg/dl (milligrams per deciliter)
Near Optimal/Above Optimal: 100 to 129 mg/dl
Borderline high: 130 to 159 mg/dl
High: 160 to 189 mg/dl
Very High: 190mg/dl and above

Levels for HDL cholesterol:

Average woman: 50 to 60 mg/dl (milligrams per deciliter)
Average man: 40 to 50 mg/dl
Low: less than 40 mg/dl

Testosterone therapy may contribute to the elevation of LDL (bad) cholesterol and the lowering of HDL (good cholesterol).

Triglycerides

Triglycerides are the chemical form in which most fat exists in food as well as in the body. They are the most common type of fat in the body, and serve as a major source of energy. The triglycerides that are present in the blood plasma are derived from fats eaten in foods or are made in the body from other energy sources like carbohydrates. Calories eaten in a meal that are not used immediately by tissues for energy are converted to triglycerides and transported to fat cells to be stored. Triglycerides are released as needed from fat tissue so they meet the body's needs for energy between meals.

Since triglycerides are circulating forms of fat, one might think that a high fat diet would raise triglycerides. However, carbohydrate appears to be the most important dietary predictor of triglycerides. Diets high in carbohydrates, especially sugar, lead to increases in triglycerides.

Triglyceride level classification

Normal: Less than 150 mg/dl (milligrams per deciliter)

Borderline high: 150-199 mg/dl

High: 200-499 mg/dl

Very high: 500 mg/dl or higher

Blood pressure (BP) test

A blood pressure reading is typically presented in two component measurements: systolic pressure over diastolic pressure. Systolic pressure is the pressure of the blood flow when the heart beats (the pressure when the first sound is heard). Diastolic pressure is the pressure between heartbeats (the pressure when the last sound is heard). The harder it is for blood to flow, the higher the numbers will be.

Classification of blood pressure for adults:

Normal-- Systolic: less than 120 mm Hg; Diastolic: less than 80 mm Hg (millimeters of mercury)

Prehypertension-- Systolic: 120-139 mm Hg; or Diastolic: 80-89

Stage 1 Hypertension-- Systolic: 140-159 mm Hg; or Diastolic: 90-99

Stage 2 Hypertension-- Systolic: 160 mm Hg or higher; or Diastolic: 100 mm Hg or higher

When a person's systolic and diastolic pressures fall into different categories, the higher category is used to classify the blood pressure status. Diagnosing high blood pressure is based on the average of two or more readings taken at two or more visits after an initial screening.

"Hypertension" is a term that means abnormally high blood pressure, even when at rest.

Testosterone therapy may contribute to raising blood pressure levels.

III. POTENTIAL SIDE EFFECTS OF TESTOSTERONE

Increased red blood cell (RBC) count

Higher-than-normal numbers of RBCs may indicate congenital heart disease, cor pulmonale (failure of the right side of the heart caused by prolonged high blood pressure in the pulmonary artery and right ventricle), polycythemia, or kidney disease with high erythropoietin production. For more on [polycythemia](#), see below.

Increased hemoglobin (HGB)

Higher-than-normal hemoglobin may indicate congenital heart disease, cor pulmonale (failure of the right

side of the heart caused by prolonged high blood pressure in the pulmonary artery and right ventricle), polycythemia, or increased RBC formation associated with excess erythropoietin. For more on [polycythemia](#), see below.

Increased hematocrit (HCT)

High HCT may indicate dehydration, erythrocytosis (excessive red blood cell production), or polycythemia. For more on [polycythemia](#), see below.

Polycythemia

Testosterone usage has been shown to increase "erythropoiesis," or red blood cell production. "Polycythemia" is an abnormally high level of red blood cells. An excess of red blood cells thickens the blood, impeding its passage through small blood vessels and causing a number of potential health problems. There are a few different types of polycythemia: "**polycythemia vera**," "**relative polycythemia**," and "**secondary polycythemia**."

It is important to understand the differences between the three types of this condition, because polycythemia as a result of testosterone usage would probably best be categorized under *secondary polycythemia*. Of course, if your doctor diagnoses you with polycythemia, it is still important to determine which type of polycythemia you have and proceed with the proper treatment-- one should not automatically assume that an initial elevated RBC or HCT reading is necessarily secondary polycythemia simply based on testosterone use alone. Family history and other factors (listed below) should be considered.

Polycythemia vera (or "primary polycythemia") is a rare myeloproliferative disorder, meaning that the bone marrow cells (which produce red blood cells) proliferate uncontrollably. In polycythemia vera, the RBC count increases *without* being stimulated by the red blood cell stimulating hormone, erythropoietin (EPO). Risk factors include exposure to radiation, some cancer therapy drugs, and familial history of polycythemia vera.

In the case of **relative polycythemia**, an individual has an excess of RBCs due to a loss of volume in the plasma (the liquid portion of the blood). This can be due to dehydration, use of diuretics, burns, stress, or high blood pressure.

Secondary polycythemia is defined as an absolute increase in RBCs caused by an increase in the RBC stimulating hormone, erythropoietin (EPO). Potential causes include low blood oxygen caused by heart disease, prolonged carbon monoxide exposure caused by smoking, hereditary disorders producing an abnormal hemoglobin or an overproduction of EPO, or kidney disease.

Complications that can arise from polycythemia include thrombosis (blood clots that can cause stroke or heart attack), hemorrhage, and heart failure.

The objective of treatment is to reduce the thickness of the blood due to the increased red blood cell mass and to prevent hemorrhage and thrombosis.

Phlebotomy is one method used to reduce the high blood viscosity (blood thickness). In phlebotomy, 1 pint of blood is removed weekly until the HCT is less than 45%, then phlebotomy is continued as necessary.

For relative polycythemia and secondary polycythemia, treatment must also address any underlying risk factors, such as smoking.

Elevated liver levels & potential liver conditions

Testosterone therapy can cause alterations in liver function tests, cholestatic jaundice, hepatocellular neoplasms (rare), and peliosis hepatis. Specifically, the use of orally-administered C-17 alpha alkylated testosterone has been associated with such complications, in addition to being associated with hepatocellular carcinoma and hepatic adenomas. Oral use of C-17 alpha alkylated testosterone is therefore generally discouraged, as injectable, transdermal, buccal, and pellet delivery methods are thought to significantly lower such risks. No matter which testosterone delivery method is being used, it is prudent to screen the user with liver function tests to monitor the overall health of the liver.

Cholestatic jaundice

Jaundice is a yellowing of the skin and other tissues due to excess circulating bilirubin. Mild jaundice is usually detectable when serum bilirubin reaches 2 to 2.5 mg/dl (milligrams per deciliter). Cholestatic jaundice is due to a biliary obstruction (a condition where bile excretion from the liver is blocked, which can occur either in the liver or in the bile ducts).

Hepatocellular neoplasms

Hepatocellular neoplasm is a general term for abnormal new tissue which has grown on the liver (neoplasm means "new growth"). These growths may be benign or cancerous.

Peliosis hepatis

Peliosis hepatis is a condition in which multiple blood-filled cystic spaces develop throughout the liver which may lead to congestion and necrosis.

Hepatic adenomas

Hepatic adenoma (HA) is a rare benign tumor of the liver. Two types of HAs have been identified, including tumors of bile duct origin and tumors of liver cell origin. HAs may rupture and bleed, causing pain. Although they are benign lesions, HAs can undergo malignant transformation to hepatocellular carcinoma (HCC). Although malignant transformation is rare, surgery is advocated in most individuals with presumed HAs.

Hepatocellular Carcinoma

"Hepatocellular carcinoma" (HCC) is a term for a malignant (cancerous) tumor of the liver.

Suppression of clotting factors

Testosterone has been reported to suppress clotting factors II, V, VII, and X. For those also taking anticoagulant medication such as Warfarin, testosterone may increase the effects of such medication. Caution should be exercised by those taking such medication, or those with bleeding disorders. Consult with your doctor about possible dosage adjustments.

Elevated lipid profile/High cholesterol

The higher an individual's level of cholesterol, the higher their risk of coronary heart disease. The lower your LDL cholesterol, the lower your risk of heart attack and stroke. It is also important to maintain a

high enough level of HDL, or "good" cholesterol. Excessive total cholesterol contributes to atherosclerosis and subsequent heart disease.

Atherosclerosis is a condition in which fat, cholesterol and other substances are deposited along the walls of arteries. This fatty material thickens and hardens, forming "plaques" that diminish the elasticity of the arteries and may eventually block them. Clots can form around plaques, posing an additional danger if they break off and travel to the heart, lungs, or brain.

High triglyceride levels may be associated with a higher risk for heart disease and stroke. People with high triglycerides often have other conditions that increase the likelihood of developing cardiovascular disease, such as diabetes and obesity. High triglyceride levels may also indicate cirrhosis, hypothyroidism, high carbohydrates in diet, poorly controlled diabetes, or pancreatitis.

High Blood Pressure

High blood pressure, or "hypertension," directly increases the risk of coronary heart disease and stroke, especially along with other risk factors. Testosterone therapy can contribute to raised blood pressure levels. Because of this, and because of other potential risk factors for heart disease such as increased lipid profile or polycythemia, it is wise to monitor blood pressure levels throughout testosterone therapy.

Edema

Edema refers to the abnormal buildup of fluid in the ankles, feet, and legs. It is usually painless. Testosterone is known to cause water and electrolyte retention (i.e., sodium, potassium, calcium, and inorganic phosphates), which can contribute to such swelling. Sometimes increasing daily water intake can reduce or end the problem.

Acne

Acne is a skin disorder (characterized by whiteheads, blackheads, and pimples) that affects the pilosebaceous units (PSUs) of the skin. PSUs consist of a "sebaceous" gland (oil-producing gland) connected to a canal called a "follicle." The follicle contains a fine hair, and the hair grows out through the open end of the canal at the skin's surface. This open end is usually called a "pore." There are numerous PSUs on the face, upper back, and chest (where acne problems often are worst).

The sebaceous glands produce an oily substance called "sebum" that normally empties onto the skin's surface through the pore. Trouble begins when the follicle becomes plugged, thereby preventing the normal draining of sebum. If a follicle becomes blocked for some reason, the mixture of oil cells within allows the bacteria "Propionibacterium acnes" (P. acnes), which is normally present on the skin, to grow inside the plugged follicle.

The P. acnes bacteria inside the plugged follicle causes the body to send white blood cells to that follicle, which in turn causes the area to become inflamed and painful. This leads to a variety of skin lesions.

Acne commonly appears on the face and shoulders, but may also occur on the trunk, arms, legs, and buttocks. Acne can be triggered by hormonal changes; stress; oily facial, body, or hair products; humidity; sweating; and irritation. Testosterone therapy increases activity of the sebaceous glands, and so may increase the presence of acne. [Click here or more information on acne and how to treat it.](#)

Seborrhea

Seborrhea, or "seborrheic dermatitis," is a skin condition characterized by loose, greasy or dry, white to yellowish scales on the skin, sometimes with accompanying redness. It may involve the skin of the scalp, eyebrows, eyelids, nose, lips, behind the ears, the external ear, and the skin of the trunk, particularly over the sternum and along skin folds. This side effect of testosterone usage can be temporary or a more long-lasting condition that may flare up due to contributing factors such as stress, fatigue, weather extremes, oily skin, infrequent shampoos or skin cleaning, use of lotions that contain alcohol, skin disorders (such as acne), or obesity.

Miscellaneous other side effects

Also listed as potential side-effects of testosterone use are: nausea, headache, anxiety, depression, or generalized paresthesia.

Paresthesia

Paresthesia refers to an abnormal burning or prickling sensation which is generally felt in the hands, arms, legs, or feet, but may occur in any part of the body. Many describe it as a "pins and needles" feeling.

Allergic reactions

Some people may find that they have allergic reactions to the oil in which their injectable testosterone is suspended, or they may have reactions to the skin permeating agents used in T patches or in T creams/gels. If that is the case you may need to try a different delivery method of testosterone, or have a [compounding pharmacy](#) prepare your testosterone using a different oil or cream.

Heart-healthy diet and exercise

Because testosterone use may increase cholesterol levels, blood pressure, and/or red blood cell count, it may be wise to implement a more heart-healthy way of eating and perform regular exercise upon beginning testosterone therapy (if you are not already doing so). Because testosterone use sometimes increases appetite, a healthy lifestyle may also help in keeping off extra body fat.

The American Heart Association (www.americanheart.org) offers diet and exercise guidelines designed to help keep cholesterol levels, blood pressure, and body weight within healthy ranges.

BIBLIOGRAPHIC RESOURCES

Prescribing information sheets for:

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