

Low testosterone

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THE STORY IN ONE SENTENCE

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“Confirm low testosterone with two morning blood draws, check LH and FSH to see if the testis or brain is the problem, then treat only if you have real symptoms and it is safe.”

Normal anatomy — the body's job

Testosterone is made in a three-step loop: the hypothalamus (a control center deep in the brain) releases GnRH, which travels a short distance to the pituitary gland (a tiny gland just below the brain), triggering it to send out LH and FSH into the bloodstream; those hormones then reach the testicles and tell the Leydig cells (the testosterone factories inside the testis) to make testosterone, which flows everywhere to build muscle, harden bone, lift mood, and fuel sex drive.

BODY'S JOB

Testosterone is the body's main builder and energizer in men. It tells muscles to grow, bones to stay dense and strong, the brain to feel awake and interested in sex, and red-blood-cell factories in the bone marrow to keep making enough oxygen carriers. Without it, the body shifts into low-power mode—muscle shrinks, bones thin, energy drops, and mood sinks.

1. The hypothalamus (deep brain control room) senses that testosterone is low and releases GnRH (gonadotropin-releasing hormone).
2. GnRH travels a few millimeters down to the pituitary gland, which sits just below the brain.
3. The pituitary releases LH (luteinizing hormone) and FSH (follicle-stimulating hormone) into the bloodstream.
4. LH reaches the Leydig cells in the testicles and tells them to make testosterone; FSH helps sperm production.

5. Testosterone flows through the blood to muscles, bones, the brain, and other organs, where it binds to receptors and turns on building and energy programs.
6. When testosterone rises high enough, it sends a feedback signal back to the hypothalamus and pituitary to slow down GnRH and LH—like a thermostat turning off the heat when the room warms up.

What breaks

Low testosterone happens when either the testicles themselves cannot make enough hormone (called primary), or the brain's pituitary gland stops sending the LH signal that tells the testicles to work (called secondary). The testicles can fail because of Klinefelter syndrome (when a boy is born with an extra X chromosome), direct injury or trauma, mumps infection that spreads to the testis, chemotherapy or radiation, undescended testicles that were never fixed, or just aging. The pituitary can fail because a tumor is pressing on it, because being very overweight causes inflammation that turns off GnRH, because long-term opioid pain medicine shuts down the whole axis, because prolactin (a hormone that rises with some pituitary tumors or medicines) blocks LH release, or because of a head injury or radiation to the brain.

CLINICAL TERM

Primary hypogonadism means the Leydig cells in the testis are damaged and cannot make testosterone even when LH is high; causes include Klinefelter syndrome (47,XXY karyotype), bilateral orchitis (often mumps), testicular torsion or trauma, chemotherapy (especially alkylating agents), pelvic radiation, cryptorchidism, and age-related decline. Secondary (central) hypogonadism means the hypothalamus or pituitary fails to release GnRH or LH, so the testis is healthy but unstimulated; causes include pituitary adenomas, hyperprolactinemia, obesity (adipose tissue aromatizes testosterone to estrogen and raises leptin, both of which suppress GnRH), chronic opioid use, glucocorticoid therapy, Kallmann syndrome (congenital GnRH deficiency with anosmia), head trauma, and infiltrative diseases like hemochromatosis or sarcoidosis.

How the body compensates

The body does not have a fast backup for low testosterone—there is no other hormone that can do its job. Instead, the system tries to push harder: if the problem is in the testis, the pituitary cranks up LH and FSH, hoping to squeeze out more testosterone, but if the testis is truly broken that fails. If the problem is in the brain, the whole loop stays quiet and nothing compensates at all. Over time, muscles shrink, bones thin, red blood cells drop slightly (mild anemia of hypogonadism), and the brain's mood circuits stay stuck in low gear. The danger is

that all these changes creep in slowly, so neither the patient nor the doctor notices until bones fracture or severe fatigue forces a visit.

1. When testosterone first drops, the hypothalamus senses it and tries to release more GnRH to wake up the pituitary.
2. If the testis is the problem (primary failure), the pituitary floods the blood with LH and FSH, trying to force the testis to make more testosterone—but the broken testis cannot respond, so LH and FSH stay high while testosterone stays low.
3. If the pituitary or hypothalamus is the problem (secondary failure), there is no compensation at all—the whole loop is silent, so LH, FSH, and testosterone are all low.
4. Muscles slowly lose mass because testosterone is the main signal that tells muscle fibers to grow and repair; without it, breakdown outpaces building.
5. Bones lose density over months to years because testosterone keeps osteoblasts (bone-building cells) active and shuts down osteoclasts (bone-chewing cells); low testosterone tips the balance toward bone loss, raising fracture risk (osteoporosis).
6. The brain's reward and energy circuits (especially in the prefrontal cortex and limbic system) run partly on testosterone, so low levels lead to fatigue, low motivation, poor concentration, and depression that does not respond well to usual treatments.
7. Red blood cell production drops slightly because testosterone stimulates erythropoietin release from the kidneys, so some men develop mild normocytic anemia.
8. The dangerous middle is that all these changes happen slowly—energy fades, muscle shrinks, mood sinks—so it feels like normal aging, and both patient and doctor miss the real cause until a fragility fracture or severe depression forces the issue.
9. There is no sudden crash, but the long slow decline steals quality of life and raises the risk of falls, fractures, and cardiovascular events over years.

Domino effect

1. The testis stops making testosterone (primary failure from Klinefelter, trauma, chemo, or aging), or the pituitary stops sending LH (secondary failure from obesity, opioids, tumor, or prolactin). — Testosterone is made only in the Leydig cells of the testis, and those cells work only when LH arrives as the on-switch—so if either the factory or the on-switch breaks, testosterone drops.
2. Muscles all over the body start to shrink and weaken (sarcopenia), especially in the arms, legs, and core. — Testosterone binds to receptors inside muscle cells and turns on the genes that build new protein and repair damage; without that signal, muscle breakdown (proteolysis) runs faster than rebuilding, so mass and strength fade.

3. Bones lose density and become fragile (osteoporosis), raising the risk of hip, spine, and wrist fractures. — Testosterone keeps osteoblasts (bone-building cells) busy and tells osteoclasts (bone-chewing cells) to slow down; when testosterone drops, bone chewing outpaces bone building, so bones thin and crack more easily.
4. Energy drops, motivation disappears, and mood sinks into depression that does not lift with usual treatments. — Testosterone acts in the prefrontal cortex (the brain's planning and focus center) and the limbic system (the mood and reward center) to keep energy high and mood stable; without it, those circuits run cold, causing fatigue, poor concentration, and flat or sad mood.
5. Interest in sex fades (low libido), and erections become weak or disappear (erectile dysfunction). — Testosterone fuels the brain's sexual-interest circuits and also helps blood vessels in the penis relax and fill during arousal; low levels turn off desire in the brain and starve the mechanics below.
6. Body fat increases, especially around the belly (central adiposity), and muscle-to-fat ratio flips. — Without testosterone's muscle-building push, the body stores more calories as fat instead of muscle; belly fat then makes the problem worse by turning testosterone into estrogen (via the aromatase enzyme), further lowering active testosterone.
7. Red blood cell count may drop slightly, causing mild anemia and adding to fatigue. — Testosterone tells the kidneys to release erythropoietin (the hormone that orders the bone marrow to make red blood cells); less testosterone means less erythropoietin and fewer oxygen carriers.
8. All these problems trace back to one broken pipe—either the testis itself or the brain signal that runs it—so fixing that one upstream break (with testosterone replacement if safe, or treating the pituitary tumor, stopping the opioid, or losing weight) can reverse the whole cascade. — Every downstream symptom (weak muscles, thin bones, low mood, no sex drive, belly fat) is the body's response to missing one key hormone; replace the hormone or fix the signal, and the dominoes run backward—muscle rebuilds, bone hardens, mood lifts, and energy returns.

Symptoms · what the patient feels, and why

- Low sex drive (reduced interest in sex): Testosterone is the main hormone that powers sexual desire in men. When levels drop, the brain's signals for wanting sex get weaker, so interest fades.
- Trouble getting or keeping erections: Testosterone helps the blood vessels in the penis relax and fill with blood to create an erection. Low testosterone makes this process less reliable, though most erection problems actually come from blood-flow issues rather than low testosterone alone.

- Fatigue and low energy all day: Testosterone helps power muscle cells and brain circuits that keep you alert and energized. When it drops, cells work less efficiently, like a battery running low, so you feel drained even after rest.
- Loss of muscle mass and strength: Testosterone tells muscle cells to build and maintain protein. Without enough, muscles shrink over time and get weaker, even if you stay active.
- Increase in body fat, especially around the belly: Low testosterone shifts how the body stores energy. Fat cells multiply more easily and muscles burn less fuel, so fat builds up, especially in the abdomen.
- Mood changes: feeling down, irritable, or less motivated: Testosterone helps regulate mood circuits in the limbic system (the brain's emotional center). Low levels can dampen motivation and make emotions feel heavier or more fragile.
- Hot flashes or sweating episodes: Testosterone helps stabilize the hypothalamus (the brain's thermostat). When levels drop suddenly or get very low, the thermostat gets confused and triggers heat waves and sweating, similar to what happens in menopause.
- Thinning bones (osteoporosis) over time: Testosterone stimulates bone-building cells called osteoblasts. Low levels slow new bone formation, so bones gradually lose density and become fragile, raising fracture risk.
- Smaller or softer testicles: The testicles themselves make most of the body's testosterone. If they shrink or feel softer, it often means the testosterone-making cells inside are damaged or not getting the right signals from the pituitary gland.
- Breast tissue growth (gynecomastia): When testosterone is low, the balance tips toward estrogen (a small amount is normal in men). Estrogen makes breast tissue grow, so tender lumps or swelling can appear under the nipples.

Focused exam

- Testicular size and firmness on physical exam — feel whether each testis is normal-sized (about 4–5 cm long) and firm, or small and soft: A small, soft testis tells you the testis itself is failing — from Klinefelter syndrome, old infection, chemotherapy damage, or trauma. A normal-sized testis with low testosterone points upstream to the brain (hypothalamus or pituitary gland, the control centers that send signals to the testis).
- Body mass index, waist circumference, and neck circumference — measure each one and ask about snoring or witnessed pauses in breathing at night: Obesity and obstructive sleep pauses in breathing (apnea) both lower testosterone by shutting down the hypothalamus and pituitary without breaking the testis. Neck circumference over 17 inches in men raises suspicion for sleep pauses in breathing. Treating these often brings testosterone back up without any hormone replacement.

- Medication history — specifically ask about opioid pain medicines (morphine, oxycodone, fentanyl patches) and corticosteroids (prednisone): Chronic opioid use blocks the hypothalamus from sending GnRH (gonadotropin-releasing hormone, the first signal in the chain that tells the testis to make testosterone), so testosterone drops. Stopping or lowering the opioid often reverses this. Corticosteroids also suppress the whole hormone axis.
- Gynecomastia — feel for tender breast tissue under the nipple on each side: Breast tissue growth in men can happen when testosterone is low and estrogen (a hormone made from leftover testosterone) becomes too high compared to testosterone. It can also point to liver disease or a testicular tumor making extra estrogen.
- Visual field testing by confrontation and ask about headaches or vision changes: A pituitary tumor (prolactinoma or other adenoma) can press on the optic chiasm (where the eye nerves cross) and cause tunnel vision or headaches, while also crushing the cells in the pituitary that make LH and FSH. Low testosterone with high prolactin or visual field loss means you need an MRI of the brain.
- Libido, morning erections, energy level, mood, and muscle strength — ask how each has changed over the past year: Low testosterone causes a cluster: low sex drive, fewer or no morning erections, constant tiredness, depressed mood, and trouble building or keeping muscle. Seeing all of these together points to testosterone as the shared root cause, not separate problems.

Diagnostics · every test answers a question

- Morning fasting total testosterone level, drawn before 10 AM on two separate days → Is testosterone truly low, or was this just one bad day? Testosterone peaks in the early morning and varies day to day, so you need two low results to confirm.
- Luteinizing hormone (LH) and follicle-stimulating hormone (FSH) levels → Is the problem in the testis itself, or in the brain (hypothalamus or pituitary)? LH and FSH are the brain's command signals that tell the testis to make testosterone and sperm.
- Prolactin level → Is a pituitary tumor (prolactinoma) blocking LH and FSH and causing the low testosterone? High prolactin shuts down the whole reproductive hormone axis.
- Hemoglobin A1c and fasting glucose → Does this man have type 2 diabetes? Diabetes and metabolic syndrome lower testosterone, and low testosterone worsens insulin resistance — they feed each other.
- Hematocrit (part of a complete blood count) → What is the baseline thickness of the blood before starting testosterone? Testosterone replacement raises red blood cell production, which can thicken the blood and raise clot risk.

- Prostate-specific antigen (PSA) → Is there hidden prostate cancer before starting testosterone? Testosterone does not cause prostate cancer, but it can speed up growth if cancer is already there.
- DEXA scan (bone density scan) → Has chronic low testosterone already thinned the bones (osteoporosis)? Testosterone keeps bones strong; without it, fracture risk climbs.
- MRI of the pituitary (sella) if LH/FSH are low, prolactin is high, or the man has headaches or vision changes → Is there a pituitary tumor or other mass pressing on or destroying the pituitary gland?

Treatment logic

- Identify and reverse any fixable causes first: lose weight if obese, treat obstructive sleep pauses in breathing (apnea) with CPAP, stop or lower opioid medications, reduce heavy alcohol use → Obesity, sleep pauses in breathing (apnea), opioids, and alcohol all suppress the hypothalamus and pituitary, lowering their output of GnRH and LH without damaging the testis. Fixing these causes often brings testosterone back up naturally within months, without needing hormone replacement.
- Testosterone replacement therapy — choose from intramuscular injection (testosterone cypionate or enanthate every 1–2 weeks), daily transdermal gel, transdermal patch, or subcutaneous pellet implants every 3–6 months → Raises blood testosterone back to normal range (300–1000 ng/dL), which restores libido, sexual function, energy, mood, muscle mass, bone density, and red blood cell production. It replaces the hormone the body can no longer make.
- For men who need to preserve or restore fertility: clomiphene citrate (25–50 mg daily or every other day) or human chorionic gonadotropin (hCG, 1500–3000 units subcutaneously 2–3 times per week) → Clomiphene blocks estrogen receptors in the hypothalamus and pituitary, tricking them into making more GnRH and LH, which wakes up the testis to produce both testosterone and sperm. hCG mimics LH and directly tells the testis to make testosterone and sperm. Both keep the testis working instead of shutting it down.
- Monitor hematocrit and hemoglobin every 3–6 months, PSA and digital rectal exam yearly, and total testosterone level 3–6 months after starting therapy to confirm the dose is right → Catches dangerous side effects early. Hematocrit above 54% means blood is too thick and clot risk is rising — dose must be lowered or temporarily stopped. PSA rising faster than 1.4 ng/mL per year or climbing above 4.0 ng/mL raises concern for prostate cancer. Checking testosterone level confirms you are in the target range (300–1000 ng/dL).

- Stop testosterone immediately if hematocrit exceeds 54%, PSA rises sharply or prostate nodule is found, severe untreated obstructive sleep pauses in breathing (apnea) is discovered, or heart failure worsens → Removes the fuel driving dangerous side effects. Stopping testosterone lets hematocrit fall, removes the growth signal to any hidden prostate cancer, and stops fluid retention that can worsen heart failure or sleep pauses in breathing (apnea).
- If secondary hypogonadism is caused by a prolactinoma: cabergoline (0.25–1 mg twice weekly) or bromocriptine to lower prolactin and shrink the tumor → Dopamine agonists (cabergoline, bromocriptine) lower prolactin, which removes the brake on GnRH and LH. The pituitary wakes back up, LH and FSH rise, and the testis starts making testosterone again. The tumor often shrinks too.
- Resistance exercise (weight lifting) and adequate protein intake (1.2–1.6 g per kg body weight daily) while on testosterone therapy → Testosterone builds muscle only if the muscle is being used. Resistance training gives the signal, testosterone provides the fuel. Together they restore muscle mass, strength, and metabolic health faster than testosterone alone.

Medications

Testosterone cypionate (injection) · Testosterone replacement therapy (androgen hormone)

This is a lab-made copy of testosterone (the main male sex hormone made by the testicles). It replaces the missing hormone when the body cannot make enough on its own. Once in the bloodstream, it travels to cells all over the body and tells them to do the jobs testosterone normally does—build muscle, grow facial hair, keep bones strong, support red blood cell production, and help with sex drive and energy.

1. The testosterone shot is injected into a large muscle, usually the thigh or buttock, every one to two weeks.
2. The oily solution slowly releases testosterone into the bloodstream over days.
3. Testosterone travels through the blood and enters cells by binding to androgen receptors (docking sites inside cells that respond to male hormones).
4. Inside the cell nucleus, the testosterone-receptor pair switches on genes that tell the cell to make proteins for muscle, bone, and red blood cells.
5. Within weeks to months, muscle mass increases, energy improves, bone density stabilizes, and sex drive often returns.
6. Blood levels of testosterone rise and fall between shots, so timing matters to keep levels steady.

SAFETY WATCH

Red blood cell count (hematocrit) must be checked every three to six months. Testosterone can make the bone marrow produce too many red cells, thickening the blood like syrup and raising the risk of stroke or blood clots. If hematocrit rises above 54 percent, the dose is lowered or stopped temporarily. · Prostate-specific antigen (PSA, a marker for prostate health) is checked before starting and regularly during treatment. Testosterone does not cause prostate cancer, but it can speed up growth of cancer already present. · Stop testosterone immediately if severe untreated obstructive sleep pauses in breathing (apnea) is found, as testosterone can worsen breathing pauses during sleep. · Watch for new swelling in the legs, chest pain, or trouble breathing—signs of possible blood clots. · Mood swings, increased aggression, or acne can occur, especially if doses are too high or levels swing widely between injections.

Testosterone gel (topical) · Testosterone replacement therapy (androgen hormone)

A clear gel rubbed onto the shoulders, upper arms, or abdomen once daily. The testosterone soaks through the skin into the bloodstream and replaces the hormone the testicles are not making. It works the same way as injected testosterone once it reaches the blood—telling muscle, bone, brain, and other cells to do the jobs testosterone normally does.

1. Apply the gel to clean, dry skin on the shoulders, upper arms, or stomach every morning.
2. Testosterone absorbs slowly through the skin over several hours.
3. It enters the bloodstream and travels to cells throughout the body.
4. Inside cells, it binds to androgen receptors and switches on genes that build muscle, strengthen bone, and support energy and mood.
5. Blood levels of testosterone stay more steady day-to-day compared to injections, which can feel smoother for some men.

SAFETY WATCH

Skin-to-skin contact can transfer testosterone to others—especially women and children—causing unwanted hair growth, acne, or other side effects. Cover the application site with clothing, wash hands immediately after applying, and shower before close contact. · Red blood cell count (hematocrit) checked every three to six months; too many red cells thicken the blood and raise stroke risk. · Prostate-specific antigen (PSA) monitored regularly; testosterone can speed up hidden prostate cancer. · Stop if severe untreated sleep pauses in breathing (apnea) is found. · Skin irritation or rash at the application site can occur; rotate the spot each day.

Testosterone patch (transdermal) · Testosterone replacement therapy (androgen hormone)

A stick-on patch worn on the skin, usually the back, abdomen, upper arm, or thigh. The patch slowly releases testosterone through the skin into the bloodstream over 24 hours. Once in the blood, it works the same as other forms of testosterone replacement—telling cells to do the jobs the missing hormone normally does.

1. Apply a new patch to clean, dry skin every evening (often at bedtime to mimic the body's natural testosterone peak in the morning).
2. Testosterone releases steadily through the skin over 24 hours.
3. It enters the bloodstream and binds to androgen receptors in cells throughout the body.
4. Genes switch on to build muscle, strengthen bones, make red blood cells, and support mood and sex drive.
5. Remove the old patch and rotate to a new skin site each day to avoid irritation.

SAFETY WATCH

Skin irritation, redness, or itching at the patch site is common. Rotate application sites daily and consider switching to gel or injection if irritation is severe. · Hematocrit (red blood cell count) checked every three to six months; stop or lower dose if over 54 percent. · PSA monitored for prostate health. · Stop if severe untreated obstructive sleep pauses in breathing (apnea) is present. · Patch can fall off during heavy sweating or swimming; if off for more than a few hours, replace with a fresh one.

Testosterone pellets (subcutaneous implant) · Testosterone replacement therapy (androgen hormone)

Tiny pellets (about the size of a grain of rice) made of pure testosterone are placed under the skin of the buttock or abdomen during a quick in-office procedure. The pellets slowly dissolve over three to six months, releasing a steady stream of testosterone into the bloodstream. Once in the blood, it works like other testosterone forms—replacing the hormone and telling cells to build muscle, strengthen bone, and support energy and mood.

1. The skin over the buttock or abdomen is numbed with local anesthetic.
2. A small incision (cut) is made, and several pellets are inserted under the skin with a special tool.
3. The incision is closed with a stitch or adhesive strip.
4. Pellets dissolve slowly, releasing testosterone into nearby blood vessels over three to six months.

5. Testosterone travels through the bloodstream, binds to androgen receptors, and activates genes in muscle, bone, and other tissues.
6. The procedure is repeated every three to six months to keep levels steady.

SAFETY WATCH

Infection or bleeding at the insertion site is rare but possible; watch for increasing pain, redness, or pus. · Pellets can occasionally push out (extrude) through the skin, especially in the first few weeks. · Hematocrit checked every three to six months; stop treatment if over 54 percent. · PSA monitored for prostate health. · Stop if severe untreated obstructive sleep pauses in breathing (apnea) is diagnosed. · Once inserted, dose cannot be adjusted until the next procedure, so this option is best for men with stable, well-controlled levels.

Clomiphene citrate (oral pill) · Selective estrogen receptor modulator (SERM)

Clomiphene tricks the brain into thinking testosterone and estrogen levels are low. It blocks estrogen receptors (docking sites for the hormone estrogen) in the hypothalamus and pituitary gland (the control centers at the base of the brain). The brain responds by releasing more GnRH (gonadotropin-releasing hormone), which then tells the pituitary to pour out more LH and FSH (the two hormones that signal the testicles to make testosterone and sperm). This wakes up the testicles to do their own work instead of replacing the hormone from outside. It is used mainly in younger men who want to preserve fertility or in men with secondary hypogonadism (when the testicles can still work but the brain is not sending the right signals).

1. Take one pill by mouth, usually three times per week (such as Monday, Wednesday, Friday) or daily, depending on the dose your doctor prescribes.
2. Clomiphene is absorbed from the stomach into the bloodstream and travels to the brain.
3. It blocks estrogen receptors in the hypothalamus and pituitary, making the brain think estrogen (and testosterone, which the body converts partly to estrogen) is too low.
4. The hypothalamus responds by releasing more GnRH, which signals the pituitary to release more LH and FSH.
5. LH and FSH travel through the blood to the testicles and tell them to make more testosterone and sperm.
6. Testosterone levels rise within weeks, and sperm production often improves over two to three months.
7. The testicles stay active because the signal comes from inside the body, not from outside replacement.

SAFETY WATCH

Vision changes (blurry vision, seeing spots or flashes) can occur; stop the medicine and call your doctor if this happens. · Mood swings, irritability, or emotional ups and downs are possible. · Testosterone and estrogen levels should be checked every few months to make sure the dose is right; too much estrogen can cause breast tenderness or growth (gynecomastia). · Blood clots are a rare risk, especially in men with other clotting risk factors. · Not safe for men with severe liver disease.

Human chorionic gonadotropin (hCG, injection) · Gonadotropin (hormone that mimics LH)

hCG is a hormone that acts just like LH (luteinizing hormone), the signal from the pituitary gland that tells the testicles to make testosterone. It is injected under the skin or into a muscle, usually two to three times per week. By directly stimulating the testicles, it keeps them active and producing their own testosterone and sperm. This is the preferred choice for men with low testosterone who want to preserve or restore fertility, because it does not shut down the testicles the way testosterone replacement does.

1. hCG is injected under the skin (subcutaneous) or into a muscle (intramuscular), typically two to three times per week.
2. It travels through the bloodstream to the testicles.
3. hCG binds to LH receptors on Leydig cells in the testicles, mimicking the natural LH signal.
4. The Leydig cells respond by making testosterone, which is released into the bloodstream.
5. Testosterone levels rise within days to weeks, and sperm production often improves over several months.
6. Because the testicles are doing the work, they stay active and do not shrink (testicular atrophy), unlike with testosterone replacement.

SAFETY WATCH

Injection site reactions (redness, pain, swelling) are common. · Breast tenderness or growth (gynecomastia) can happen because hCG raises testosterone, and the body converts some of it to estrogen. · Mood swings or acne may occur as testosterone rises. · Blood clots are a rare risk. · Testosterone and estrogen levels should be checked regularly to adjust the dose. · hCG is expensive and often not covered by insurance for male hypogonadism.

Red flags

- Severe, sudden-onset headaches or vision changes—may signal a pituitary tumor pressing on the optic nerves.
- Very high red blood cell count (hematocrit above 54%) on testosterone therapy—raises the risk of dangerous blood clots in the heart, lungs, or brain.
- Rapid breast growth or a hard lump in the breast—could be breast cancer, which is rare in men but more common when hormone balance is off.
- Testicular lump, pain, or one testicle much smaller than the other—may indicate testicular cancer or severe damage to testosterone-making cells.

Nursing priorities

1. Schedule two separate morning fasting blood draws before 10 AM for total testosterone, LH (luteinizing hormone), and FSH (follicle-stimulating hormone) at least one week apart — Testosterone levels bounce up and down daily and peak in early morning; two low results confirm real deficiency, and LH plus FSH tell whether the problem is in the testis or the brain
2. Screen for reversible causes by asking about opioid use, measuring BMI (body mass index), and referring for sleep study if the patient snores or has daytime sleepiness — Obesity, sleep pauses in breathing (apnea), and opioid medicines all lower testosterone but can be fixed without hormone replacement; treating these first may restore normal levels naturally
3. Check baseline hematocrit (percentage of red blood cells), prostate-specific antigen (PSA, a protein made by the prostate), blood pressure, and lipid panel before starting testosterone therapy — Testosterone raises red blood cell production, which can cause dangerously thick blood leading to clots; baseline numbers let you catch polycythemia early during treatment monitoring
4. Teach the patient that testosterone will not work immediately and symptoms improve slowly over 3 to 6 months — Unrealistic expectations cause patients to stop treatment early; energy improves in 3 to 6 weeks, sex drive in 6 to 12 weeks, and muscle strength takes 12 to 16 weeks
5. Recheck hematocrit and hemoglobin (the oxygen-carrying protein in red cells) every 3 to 6 months during testosterone treatment — Testosterone stimulates the bone marrow to make more red blood cells; hematocrit above 54 percent increases stroke and heart attack risk and requires stopping therapy or donating blood
6. Measure testosterone level 3 to 6 months after starting therapy to confirm the dose brings levels into the normal range of 300 to 1000 nanograms per deciliter — Too little testosterone leaves symptoms untreated; too much raises the risk of polycythemia, prostate growth, and heart problems without extra benefit

7. Remind patients using testosterone gel to apply it to shoulders or upper arms and wash hands immediately, keeping the area covered for 6 hours — Unwashed gel transfers to women and children through skin contact, causing inappropriate hair growth, acne, and aggression in people who should not receive testosterone
8. Monitor for worsening urinary symptoms like weak stream, nighttime urination, or trouble starting to pee, and check PSA yearly — Testosterone does not cause prostate cancer but can make existing cancer or prostate enlargement grow faster; rising PSA or new urinary blockage requires urology referral

Sources

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