

Hypothyroidism

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THE STORY IN ONE SENTENCE

The thyroid gland stops making enough hormone, so the whole body slows down—energy, warmth, digestion, heart rate, and mood all drop because every cell needs thyroid hormone to run at normal speed.

“Hypothyroidism means the thyroid gland does not make enough thyroid hormone, so the body slows down. TSH (the pituitary's push signal) goes up trying to wake the thyroid, and T4 (the main thyroid hormone) goes down. Start levothyroxine (replacement thyroid hormone) and recheck blood in 6 weeks.”

Normal anatomy — the body's job

The thyroid gland sits in the front of your neck, just below the Adam's apple, shaped like a small butterfly. Its only job is to make thyroid hormone (mostly T4, which cells convert to the active form T3), and this hormone travels through the blood to every cell in the body, telling each one how fast to work—how much fuel to burn, how much heat to make, how fast to build new proteins, and how quickly to do every task that keeps you alive.

BODY'S JOB

Thyroid hormone is the body's speed dial. It sets the pace for metabolism—the sum of all the chemical reactions that turn food into energy, keep you warm, build new tissue, and run every organ. Without enough thyroid hormone, every process slows down: your heart beats slower, your gut moves slower, your brain thinks slower, and your cells burn fuel slower, so you feel cold, tired, and sluggish.

1. The hypothalamus (a control center deep in the brain) releases TRH (thyrotropin-releasing hormone) when it senses thyroid hormone is low.
2. TRH travels down to the pituitary gland (a pea-sized gland at the base of the brain) and tells it to release TSH (thyroid-stimulating hormone).

3. TSH travels through the blood to the thyroid gland in the neck and tells it to make and release thyroid hormone (mostly T4, plus a little T3).
4. The thyroid takes iodine from food and combines it with the protein thyroglobulin to build T4 and T3, then releases them into the bloodstream.
5. T4 travels to cells all over the body; inside each cell, an enzyme strips off one iodine atom to convert T4 into T3, the active form that actually flips the switches inside the cell.
6. T3 enters the cell's nucleus (the control room) and binds to receptors on the DNA, turning on genes that make the cell work faster—burning more fuel, making more heat, building more proteins, and doing its job at normal speed.
7. When thyroid hormone levels are just right, the hypothalamus and pituitary sense it and dial back TRH and TSH—a feedback loop that keeps everything steady.

What breaks

The thyroid gland either gets damaged so it can't make hormone anymore, or it's removed, or it doesn't have the raw materials it needs. Almost always, the root problem is in the thyroid itself—not the brain or pituitary.

CLINICAL TERM

Primary hypothyroidism (the thyroid itself fails) accounts for over 95 percent of cases. The most common cause in iodine-sufficient areas is Hashimoto thyroiditis (chronic autoimmune thyroiditis): the immune system makes antibodies (anti-TPO and anti-thyroglobulin) that attack and slowly destroy thyroid tissue, so the gland shrinks and stops making hormone. Other causes: surgical removal of the thyroid (thyroidectomy, often for cancer or hyperthyroidism), radioactive iodine treatment (which kills thyroid cells), iodine deficiency (the thyroid needs iodine to build hormone—still the leading cause worldwide), and drugs that block thyroid function (lithium, amiodarone, interferon, checkpoint inhibitors like pembrolizumab). Rarely, the break is upstream: central hypothyroidism means the pituitary doesn't release enough TSH (pituitary tumor, surgery, or Sheehan syndrome after childbirth bleeding), or the hypothalamus doesn't release enough TRH—so the thyroid is healthy but never gets the signal to work.

How the body compensates

When thyroid hormone drops, the pituitary gland tries to fix it by pumping out more TSH, pushing the thyroid to work harder. If that doesn't work, the body slows everything down to save energy—heart rate drops, metabolism slows, and you feel cold and tired. Vital signs can look okay for a long time, but if the thyroid hormone stays low and stress hits (infection, cold,

surgery, sedative drugs), the body can tip into myxedema coma—a life-threatening shutdown of brain and heart function.

1. The pituitary gland senses low thyroid hormone and releases more TSH (thyroid-stimulating hormone), trying to wake up the thyroid and push it to make more hormone. TSH rises—often into double or triple digits—even when the person still feels only mildly tired. This is the body's first attempt to compensate.
2. If the thyroid is too damaged to respond, T4 and T3 stay low. The body shifts into energy-saving mode: the heart beats slower (bradycardia, often 50 to 60 beats per minute), blood pressure may drop slightly, and the person feels cold because the body is burning less fuel and making less heat.
3. The body holds onto fluid and salt to keep blood volume up, but the fluid leaks into tissues (especially around the eyes, hands, and legs) instead of staying in the bloodstream. This is called myxedema—a thick, dough-like swelling that doesn't pit when you press it, caused by mucopolysaccharide deposits in the skin.
4. The gut slows down to save energy, so food moves slowly through the intestines and constipation happens. The liver processes cholesterol more slowly, so LDL cholesterol rises. The kidneys hold onto water, and sodium can drop (hyponatremia).
5. The brain slows down: thinking gets foggy, memory gets worse, and mood drops (depression is common). Reflexes slow—when you tap the knee, the leg kicks up normally but returns to rest very slowly (delayed relaxation phase of deep tendon reflexes), a classic exam finding.
6. For most people, the body compensates well enough that they feel tired and cold but stay safe. Blood pressure, oxygen, and heart function stay in a range that keeps organs alive, so the person can live for months or years with untreated hypothyroidism and just feel lousy.
7. The danger zone is myxedema coma: if severe hypothyroidism is untreated and the person faces a big stress (infection, cold exposure, surgery, sedative drugs like opioids or benzodiazepines, or a heart attack), the body's ability to compensate fails. Core temperature drops (hypothermia, often below 95 degrees Fahrenheit), breathing slows (hypoventilation and carbon dioxide builds up), heart rate drops dangerously low, blood pressure crashes, and the brain shuts down (confusion, seizures, coma). Mortality is 25 to 60 percent even with treatment. The key is to catch and treat hypothyroidism before this tipping point.
8. Starting levothyroxine (thyroid hormone replacement) too fast or at too high a dose in someone with severe, long-standing hypothyroidism—especially if they also have coronary artery disease—can trigger a heart attack (myocardial tissue death from blocked blood flow (infarction)) because the heart suddenly has to work harder and needs more oxygen. The safe approach is to start low (especially in older adults or anyone with heart disease) and go slow, increasing the dose every 6 to 8 weeks.

Domino effect

1. The thyroid gland is damaged or destroyed, so it stops making enough thyroid hormone (T4 and T3). — This is the upstream break. In Hashimoto thyroiditis, antibodies attack the thyroid. In iodine deficiency, the thyroid lacks the building block it needs. In thyroidectomy or radioactive iodine treatment, the tissue is gone. Either way, thyroid hormone drops.
2. The pituitary gland senses the low thyroid hormone and releases huge amounts of TSH, trying to push the thyroid to work harder. — The pituitary's job is to keep thyroid hormone steady. When it sees T4 drop, it cranks up TSH—sometimes to 50, 100, or higher (normal is 0.5 to 5). If the thyroid is too damaged to respond, TSH stays high and T4 stays low. This is the lab signature of primary hypothyroidism.
3. Every cell in the body slows down because it doesn't have enough thyroid hormone to run at normal speed. You feel exhausted, cold, and sluggish. — Thyroid hormone tells the mitochondria (the cell's power plants) how fast to burn fuel and make energy (ATP, the energy currency of the cell). Without it, cells burn fuel slowly, so you make less energy and less heat. Your body temperature drops slightly, and you feel cold even in a warm room. Your muscles feel weak and tired because they can't make energy fast enough.
4. Weight goes up even though you're not eating more. — Your metabolism (the rate you burn calories) slows way down. Cells store extra calories as fat instead of burning them for energy. Fluid also builds up in tissues (myxedema), adding water weight.
5. Skin gets dry, thick, cool, and pale. The outer third of the eyebrows may thin or fall out. Hair becomes coarse, brittle, and falls out more than usual. — Thyroid hormone tells skin cells and hair follicles to grow and shed at a normal pace. Without it, the skin barrier weakens and loses moisture, so skin dries out. Hair follicles enter a resting phase and stop making new hair, so hair thins and falls out. Decreased blood flow to the skin (because the heart is pumping less and metabolism is slow) makes the skin look pale and feel cool.
6. The gut moves food very slowly, so constipation happens. You may only have a bowel movement every few days. — Thyroid hormone stimulates the gut's squeezing waves (peristalsis)—the wave-like muscle contractions that push food through the intestines. Without it, the smooth muscle in the gut barely squeezes, so stool sits in the colon for days, getting drier and harder.
7. The heart beats slowly (bradycardia, often 50 to 60 beats per minute). You may feel your heart pounding weakly or skipping. Blood pressure may drop slightly, and you feel dizzy when you stand up. — Thyroid hormone directly tells the sinoatrial node (the heart's pacemaker in the right atrium) to fire faster and tells heart muscle cells to contract harder. Without it, the heart rate drops, stroke volume (how much blood the heart pumps per beat) falls, and cardiac output (total blood pumped per minute) decreases. The heart can also swell slightly (dilated cardiomyopathy) and fill with fluid around it (pericardial a fluid collection (effusion)).

- 8.** You feel sad, unmotivated, and mentally foggy. Memory gets worse, and thinking feels slow. Depression is very common. — Thyroid hormone helps regulate neurotransmitters in the brain—especially serotonin (the mood stabilizer that keeps feelings steady), norepinephrine (the alertness messenger that keeps you awake and focused), and dopamine (the motivation messenger that makes you want to do things). Low thyroid hormone means these neurotransmitters drop or don't work as well, so mood crashes and thinking slows. The prefrontal cortex (the front part of the brain that plans, focuses, and solves problems) also works less efficiently, causing brain fog and memory problems.
- 9.** Cholesterol (especially LDL, the bad kind) goes up, even if you eat a healthy diet. — The liver needs thyroid hormone to clear LDL cholesterol from the bloodstream. Without it, the liver's LDL receptors decrease, so cholesterol builds up in the blood. This raises the long-term risk of heart disease.
- 10.** Reflexes slow down in a unique way: when the doctor taps your knee or ankle, your leg or foot kicks up normally, but it returns to rest very slowly (delayed relaxation phase). — Thyroid hormone speeds up the muscle's ability to relax after a contraction by helping calcium get pumped back into storage inside the muscle cell. Without it, the muscle takes much longer to relax, so the reflex looks slow-motion on the way down. This is a classic physical exam finding.
- 11.** In severe cases, thick swelling (myxedema) appears around the eyes, hands, legs, and face. The swelling feels dough-like and doesn't leave a dent when you press it (non-pitting swelling (edema)). — Low thyroid hormone causes mucopolysaccharides (thick, sticky sugar-protein molecules) to build up in the skin and tissues. These molecules pull water into the tissue, causing swelling that feels firm and rubbery instead of soft and fluid-filled like regular swelling (edema).
- 12.** If untreated and a major stress hits (infection, cold, surgery, or sedative drugs), the body can tip into myxedema coma: confusion or unconsciousness, dangerously low body temperature (hypothermia), very slow heart rate, low blood pressure, and slow, shallow breathing. — The brain's metabolism is so slow that the reticular activating system (the brain's wake-up center in the brainstem that keeps you alert and conscious) shuts down, causing confusion and coma. The hypothalamus (the brain's thermostat that controls body temperature) can't maintain body heat, so core temperature drops below 95 degrees Fahrenheit. The respiratory center in the medulla (the breathing control center in the lower brainstem) slows, so breathing gets shallow and carbon dioxide builds up in the blood. The heart barely pumps, blood pressure crashes, and organs start to fail. This is a medical emergency with high mortality.

Symptoms · what the patient feels, and why

- **Feeling tired all the time, even after sleeping:** The thyroid gland (a small butterfly-shaped organ in your neck) makes hormones that set the speed for every cell in your body—like a throttle on an engine. When the thyroid doesn't make enough hormone, every cell slows down. Your mitochondria (the tiny power plants inside each cell that burn fuel to make energy) work more slowly, so you feel exhausted because your cells aren't making energy fast enough.
- **Weight gain without eating more:** Your metabolism (the rate your body burns fuel) slows down because thyroid hormone usually tells cells to burn calories faster. With less hormone, your body stores more calories as fat instead of burning them—like turning down the burner under a pot so it barely simmers.
- **Feeling cold when others are comfortable:** Thyroid hormone helps cells produce heat as they work. When levels drop, your cells make less heat, so you feel cold even in a warm room—like turning down the thermostat inside your body. Your skin blood vessels also constrict (narrow) to hold in warmth, making your hands and feet feel icy.
- **Skin that feels dry and rough:** Skin cells slow down their work and don't make enough natural oils (sebum) to keep skin soft. The outer layer of skin also renews itself more slowly, so dead cells pile up and make skin feel rough, flaky, and scaly—like paint that's peeling.
- **Hair that falls out or thins, especially on the head and outer third of the eyebrows:** Hair follicles (the tiny pockets where hair grows) need thyroid hormone to keep cycling through growth. When hormone levels drop, follicles pause and enter a resting phase too early, so more hairs fall out and fewer new ones grow back. Over time, hair becomes thin and brittle.
- **Constipation (trouble having bowel movements):** The muscles in your intestines squeeze food along in waves (called the gut's squeezing waves (peristalsis)). Thyroid hormone keeps these waves moving at a normal speed. With less hormone, the waves slow down—like a conveyor belt running in slow motion—so food and waste move through more slowly and become hard and dry.
- **Feeling sad, down, or hopeless:** Thyroid hormone helps brain cells make and use serotonin and norepinephrine (brain messengers that lift mood and energy). When thyroid levels fall, these messengers drop too, which can make you feel low, lose interest in things you used to enjoy, or feel hopeless—like a dimmer switch turned down on your emotions.
- **Thinking and remembering feel slower or fuzzy (brain fog):** Brain cells need thyroid hormone to work at full speed. When levels are low, signals between neurons (brain cells) slow down—like a computer running on low battery—so it's harder to focus, remember details, find the right words, or think through problems quickly.

- Slow heart rate (often below 60 beats per minute at rest): Thyroid hormone tells the heart how fast to beat. With less hormone, the heart's natural pacemaker (the sinoatrial node, a cluster of cells in the upper right chamber) fires more slowly, so your pulse drops and blood pumps more slowly through your body.
- Swelling in the face, hands, or legs (puffy look, especially around the eyes): When thyroid hormone is low, a sticky protein called mucin builds up under the skin (a condition called myxedema). At the same time, the kidneys hold on to more salt and water. This extra fluid and protein make tissues swell and look puffy—especially around the eyes, face, hands, and ankles.

Focused exam

- Heart rate under 60 beats per minute (bradycardia): Thyroid hormone tells the heart how fast to beat. When the thyroid does not make enough hormone, the heart slows down like a car stuck in low gear. This slow pulse shows the whole body is running on less fuel.
- Puffy face, swollen eyelids, and thick tongue: Low thyroid hormone causes mucopolysaccharides (thick, sugary proteins) to pile up under the skin and trap water. This swelling—called myxedema—is like stuffing a wet sponge under the skin. It shows the thyroid is not doing its job.
- Dry, cool, coarse skin and hair loss: Thyroid hormone keeps skin cells and hair follicles growing and working. Without enough, skin dries out like old leather and hair falls out because the follicles shut down to save energy.
- Goiter—a lump or swelling in the front of the neck where the thyroid sits: In Hashimoto thyroiditis (the most common cause of hypothyroidism in the United States), the immune system attacks the thyroid. The gland swells as immune cells crowd in. You can see or feel this lump in the neck. Not all hypothyroid patients have a goiter, but when it is there it points to Hashimoto or iodine deficiency.
- Delayed relaxation of deep tendon reflexes—tap the knee and the leg kicks back slowly: Thyroid hormone speeds up nerve and muscle signaling. With low hormone, the reflex arc slows down like a video in slow motion. This delayed relaxation phase is a classic finding in hypothyroidism.
- Confusion, sleepiness, or slurred speech in an older adult, especially if body temperature is under 95°F: Severe, untreated hypothyroidism can lead to myxedema coma—a life-threatening state where metabolism drops so low the brain fogs over, breathing slows, and body temperature falls. This is a medical emergency.

Diagnostics · every test answers a question

- TSH (thyroid-stimulating hormone) → Is the pituitary gland screaming at the thyroid to make more hormone? TSH is the command signal from the pituitary (a pea-sized gland at the base of the brain) to the thyroid.
- Free T4 (free thyroxine) → How much active thyroid hormone is actually in the blood and available to cells?
- Anti-TPO antibodies (thyroid peroxidase antibodies) → Is the immune system attacking the thyroid? This test looks for antibodies that target thyroid peroxidase, an enzyme inside thyroid cells that makes hormone.
- Lipid panel (total cholesterol, LDL, HDL, triglycerides) → Is cholesterol high because the liver is not clearing it fast enough? Thyroid hormone speeds up fat breakdown.
- CBC (complete blood count) → Is the bone marrow making enough red blood cells? Thyroid hormone pushes the marrow to make blood.
- Creatine kinase (CK) → Are muscles breaking down or cramping? CK is an enzyme released when muscle cells are damaged.

Treatment logic

- Levothyroxine (synthetic T4 hormone) 1.6 mcg per kilogram of body weight per day, or start 25–50 mcg daily if older than 65 or if heart disease is present, then titrate every 6–8 weeks by checking TSH until TSH is 0.5–2.5 mIU/L → Replaces the thyroid hormone the broken gland can no longer make. Levothyroxine is converted to T3 (triiodothyronine, the active form) inside cells, so metabolism speeds back up, the heart beats normally, skin and hair grow again, and fatigue lifts. This fixes the root problem—the missing hormone.
- Check TSH and free T4 at 6–8 weeks after starting or changing the levothyroxine dose, then adjust the dose by 12.5–25 mcg increments until TSH stays in the normal range (0.5–2.5 mIU/L) → Ensures the replacement dose matches what the person's body actually needs. Too little levothyroxine leaves symptoms (fatigue, cold, constipation); too much causes hyperthyroid symptoms (tremor, racing heart, sweating, anxiety). Monitoring keeps the dose in the sweet spot.
- Take levothyroxine on an empty stomach 30–60 minutes before breakfast, and separate it from calcium supplements, iron, antacids, and soy by at least 4 hours → Maximizes absorption of levothyroxine in the small intestine so it reaches the bloodstream. Calcium, iron, aluminum (in antacids), and soy bind to levothyroxine and block it from being absorbed—like clogging a straw.

- In pregnancy, increase the levothyroxine dose by 25–30 percent as soon as pregnancy is confirmed, and check TSH every 4 weeks, aiming for TSH < 2.5 mIU/L in the first trimester and < 3.0 mIU/L in the second and third trimesters → Pregnancy increases thyroid hormone demand because the growing fetus needs thyroid hormone for brain development and the mother's blood volume expands. More levothyroxine keeps both mother's and baby's brains and metabolism working normally.
- In older adults (over 65) or anyone with coronary artery disease or heart failure, start levothyroxine at 25 mcg daily and increase slowly (by 12.5–25 mcg every 4–6 weeks); accept a slightly higher TSH goal (up to 5–10 mIU/L) if symptoms improve and the heart stays stable → Prevents sudden thyroid hormone surges from triggering angina (chest pain from blocked heart arteries), atrial fibrillation (an irregular, quivering heartbeat) (chaotic, fast heart rhythm), or heart attack. A slow ramp-up lets the heart adjust gradually without being overwhelmed.
- If myxedema coma is suspected (confusion, body temperature under 95°F, slow breathing, low blood pressure), give IV levothyroxine 200–400 mcg once, then 50–100 mcg daily, plus IV hydrocortisone 100 mg every 8 hours, in the ICU → Myxedema coma is a life-threatening emergency where metabolism drops so low the brain shuts down and breathing slows. IV levothyroxine and hydrocortisone (to support the adrenal glands, which may also be failing) can save the person's life by jump-starting metabolism quickly.

Medications

Levothyroxine · Thyroid hormone replacement

Levothyroxine is a lab-made copy of T4 (thyroxine), the main hormone your thyroid gland normally pumps out. When your thyroid can't make enough on its own, levothyroxine fills the gap. Your body takes the T4 from the pill and turns it into T3 (the active form that cells actually use for energy). This keeps your metabolism, energy, heart rate, and body temperature running at the right speed. It fixes the root problem by giving back the missing hormone.

1. You swallow the levothyroxine pill on an empty stomach, usually first thing in the morning, at least 30–60 minutes before eating.
2. Your small intestine absorbs the T4 into your bloodstream.
3. T4 travels through your blood to every cell in your body.
4. Inside cells, an enzyme called deiodinase (a chemical scissor) snips off one iodine atom from T4, turning it into T3 (the active form).
5. T3 enters the cell's control center (the nucleus, where DNA sits) and flips on genes that speed up energy production, raising your metabolism, heart rate, and body warmth.

6. As T4 and T3 levels climb, your pituitary gland senses the change and dials down TSH (thyroid-stimulating hormone, the signal that was yelling at your thyroid to work harder), so your TSH number drops back toward normal.

SAFETY WATCH

Starting dose: Most adults start at 1.6 micrograms per kilogram of body weight per day (roughly 100–125 micrograms for an average adult). Older adults (over 65) and anyone with heart disease start much lower — usually 25–50 micrograms — and go up slowly (by 12.5–25 micrograms every 6–8 weeks) to avoid stressing the heart. · Check a TSH blood test 6–8 weeks after starting the pill or changing the dose. The goal is TSH in the normal range, usually 0.5–4.5 mIU/L. Younger adults often feel best with TSH closer to 1–2, while older adults may do fine closer to 4. · Take it on an empty stomach, at least 30–60 minutes before breakfast, with plain water only. Wait at least 4 hours before taking calcium, iron, antacids, magnesium, or soy — they all block absorption. · Pregnancy: Your dose will need to go up by about 30% as soon as you know you are pregnant, because the baby depends on your thyroid hormone in the first three months (before its own thyroid starts working). Check TSH every 4 weeks during pregnancy to keep it in the safe range (usually under 2.5 in the first trimester). · Too much levothyroxine feels like an overactive thyroid: fast or pounding heart, shaking hands, sweating, weight loss, trouble sleeping, or feeling anxious or jittery. If this happens, call your doctor — the dose is too high. · Levothyroxine is very safe when the dose is right for you. Most people take it for life. It has almost no side effects when you are at the correct dose.

Red flags

- Chest pain, trouble breathing, or a very slow heart rate (below 50 beats per minute)—these can signal myxedema coma, a life-threatening emergency where the body shuts down from severe thyroid deficiency.
- Severe confusion, extreme sleepiness, or passing out—signs that brain function is dropping dangerously low and you need emergency care right away.
- Body temperature below 95°F (35°C, measured with a thermometer)—the body can't make enough heat, and this can lead to organ failure without urgent treatment.
- Sudden, severe swelling in the neck that makes it hard to swallow or breathe—this can mean bleeding into a goiter (swollen thyroid) or rapid growth that presses on the windpipe and blocks air.

Nursing priorities

1. Monitor vital signs every 4 hours, especially heart rate and body temperature — Low thyroid hormone slows the heart causing a slow heart rate (bradycardia) (under 60 beats per minute) and drops body temperature below 97 degrees Fahrenheit; severe drops signal myxedema coma which needs ICU care
2. Assess mental status and level of consciousness every shift using Glasgow Coma Scale or AVPU method — Severe hypothyroidism causes brain swelling and decreased oxygen use by brain cells leading to confusion, slow thinking, or coma; worsening mental status is an emergency requiring immediate physician notification
3. Teach patient to take levothyroxine on empty stomach 30 to 60 minutes before breakfast with full glass of water — Food reduces levothyroxine absorption in the small intestine by 40 percent; consistent timing on empty stomach ensures steady blood levels and proper TSH (thyroid stimulating hormone) control
4. Review all medications and supplements, separate calcium, iron, antacids, and fiber supplements by 4 hours from levothyroxine dose — These substances bind to levothyroxine in the stomach and intestines preventing absorption into the bloodstream; poor absorption causes treatment failure and continued symptoms
5. Monitor bowel movements daily and implement constipation prevention protocol with fluids, fiber, and activity — Low thyroid hormone slows the gut's squeezing waves (peristalsis) (intestinal muscle contractions that move stool); severe constipation can lead to fecal impaction (blocked colon) requiring manual removal
6. Assess skin integrity every shift, apply moisturizer, and use warm blankets if patient reports feeling cold — Hypothyroidism decreases sweat gland activity and skin cell turnover causing severe dry skin that cracks and bleeds; reduced metabolism lowers body heat production causing cold intolerance
7. Educate patient that symptom improvement takes 4 to 6 weeks and TSH testing happens every 6 to 8 weeks until levels normalize — Levothyroxine has a half-life (time for half the drug to leave the body) of 7 days so steady state blood levels take 5 to 6 weeks; TSH must stabilize before dose adjustments to avoid over-treatment or under-treatment
8. Screen for depression using PHQ-2 or PHQ-9 tool and refer to mental health if score is elevated — Hypothyroidism causes chemical changes in the brain lowering serotonin (mood chemical) and dopamine (motivation chemical) leading to depression in 40 to 50 percent of patients; depression may need separate treatment even as thyroid improves

Sources

- American Thyroid Association (ATA)
- Endocrine Society Clinical Practice Guideline on Hypothyroidism

- American Association of Clinical Endocrinology (AACE)
- UpToDate Clinical Decision Support

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