Thyroid, adrenal and pituitary

Slow or fast thyroid, thyroid surgery, Addison's or Cushing's, SIADH or DI

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1 AT A GLANCE

The thyroid sets the body's pace: too little hormone slows everything, and too much speeds it up. The adrenal and pituitary glands control stress, salt and water, so their disorders can turn dangerous fast.

Hypothyroid or hyperthyroid: opposites

	Hypothyroid: slow	Hyperthyroid: fast
Mood	Tired, slow, often depressed	Nervous, restless, shaky
Temperature	Cold intolerance	Heat intolerance; sweating
Heart	Slow; diastolic pressure may rise	Fast; often high blood pressure
Weight	Weight gain; constipation	Weight loss despite a big appetite; diarrhea
Skin and hair	Dry, pale, cool; coarse hair	Warm, moist; fine hair. Also bulging eyes (exophthalmos)
★ **TSH**	**High in primary disease** (central disease: check free T4)	**Low** in primary disease
Cause	Hashimoto's thyroiditis, where iodine is sufficient	Graves' disease
★ **Emergency**	**Myxedema coma**: hypothermia (the hallmark), a very slow heart rate, low blood pressure, falling consciousness	**Thyroid storm**: high fever, a racing heart, nervous system, gut and heart dysfunction. Can progress to low blood pressure

Hypothyroidism: levothyroxine and care

- ★ Levothyroxine: **same time every day, on an empty stomach**, apart from calcium, iron and soy. Don't switch brands.
- Older clients and those with heart disease start low and go up slowly; others may start at the full dose. Expect repeated TSH tests.
- Report signs of too much: a fast heart rate, chest pain, sweating, heat intolerance.
- Use sedatives and opioids cautiously: extra sedation and breathing depression.

After a thyroidectomy

- ★ **Airway first**: bleeding, swelling or low-calcium spasm can block it. Watch for stridor, neck swelling, low oxygen, trouble swallowing.
- ★ Check the dressing **behind the neck** too. A neck hematoma is an emergency, escalated per protocol. Keep a tracheostomy tray nearby; neck neutral.
- ★ Numbness, tingling, cramps, Chvostek's and Trousseau's signs: **low calcium** from parathyroid injury. Report it; expect calcium and vitamin D.
- Hoarseness can mean laryngeal nerve injury: rest the voice, watch for aspiration.

Hyperthyroidism: drugs and care

- ★ Methimazole and PTU: **report fever or a sore throat at once** (they can wipe out white cells). PTU can injure the liver: report itching, poor appetite, pain under the right ribs.
- Beta blockers, like propranolol, ease fast heart rate, tremor, anxiety.
- Radioactive iodine often leaves lifelong hypothyroidism. For a while after, keep distance from others; avoid anyone pregnant.
- Thyroid storm triggers: untreated disease, severe stress, stopping antithyroid drugs suddenly, handling the gland in surgery.

Parathyroid disorders

	Hypoparathyroidism	Hyperparathyroidism
Calcium	Low; usually from neck surgery	High; primary is usually a tumor
Signs	Tingling, cramps, rhythm changes; tetany, seizures	Nausea, constipation, thirst, bone pain, kidney stones
Care	Calcium, vitamin D; high-calcium, low-phosphorus foods	Surgery cures primary disease. Meanwhile, fluids lower calcium; furosemide only if overloaded

Pattern: Parathyroid hormone raises calcium and lowers phosphorus, so they often move opposite ways.

Addison's or Cushing's: mirror images

	Addison's: too little cortisol	Cushing's: too much cortisol
Cause	Usually autoimmune, or from infections like TB. Suddenly stopping long-term steroids causes a different, central type	Most often steroid medicine, like prednisone
Pressure, glucose	Often low pressure; glucose can be low	Often high pressure; glucose high
★ **Sodium, potassium**	**Often low sodium, high potassium**	Can be high sodium, low potassium
Signs	Tired, weak, dizzy on standing; nausea, belly pain; salt craving; often weight loss and darker skin	Moon face, buffalo hump, purple stretch marks; weight gain on the trunk; thin skin that bruises; infections; thin bones
★ **Treatment**	Lifelong hydrocortisone and fludrocortisone. **Never skip doses**; when ill, the glucocorticoid goes up per the sick-day plan	**Taper steroids; never stop them suddenly.** Check glucose, blood pressure, potassium; protect the skin; prevent infection

Not every case: Darker skin, low sodium and high potassium describe primary adrenal insufficiency, and may be absent.

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1 AT A GLANCE, CONTINUED

SIADH or diabetes insipidus: the water disorders

	SIADH: too much ADH	DI: too little ADH, or ignored
★ Urine	Inappropriately concentrated, not always scant	Huge, dilute urine every hour, with intense thirst
Sodium	Low (hypotonic, euvolemic): nausea, headache, confusion, falls; severe: seizures	Rises if the client can't drink enough; confusion follows
Causes	Brain injury, lung disease, cancers, some drugs	Often pituitary surgery or head injury. Lithium: the kidney type
★ Treatment	**Severe symptoms: hypertonic saline right away**, with serial sodium checks. Suitable chronic, non-emergency cases, after assessment: follow the ordered fluid limit, counting all fluids; seizure and fall precautions	Central type: desmopressin. On it, drinking more than the body needs can cause a dangerous sodium imbalance

Both: Daily weights and intake and output track the water. Raise long-standing low sodium slowly, within limits: too fast can damage the brain.

Adrenal crisis: an emergency

- The need for cortisol outruns the supply. Triggers: infection, surgery, trauma, dehydration, stopping long-term steroids suddenly.
- Low blood pressure sliding into shock, confusion, vomiting, belly pain, low glucose. High potassium: monitor the heart.
- ★ **Hydrocortisone right away, by vein or muscle, with IV saline.**
- ★ Vomiting or can't keep medicine down: emergency injected hydrocortisone and urgent care, not just a higher oral dose.

Pheochromocytoma

- A rare, usually benign adrenal tumor releasing too much epinephrine and norepinephrine.
- ★ **Attacks**, minutes to hours: headache, palpitations, sweating, high blood pressure.
- Surgery removes it, once medicines steady the blood pressure and pulse.

2 PRIORITY AND SAFETY CALLS

★ After a thyroidectomy, **the airway comes first**. Check behind the neck for blood: a hematoma is an emergency, escalated per protocol.

★ Tingling around the mouth and fingers after thyroid surgery isn't expected: **check Chvostek's and Trousseau's signs and report it**.

Fever or a sore throat on methimazole or PTU: report it at once.

★ Addison's, vomiting, can't keep hydrocortisone down, dizzy, low pressure: **possible adrenal crisis. Expect IV or IM hydrocortisone and IV saline now.** Holding the steroid is the trap.

Long-term prednisone is tapered: stopping suddenly can bring on adrenal crisis.

Extra fluids in SIADH is a trap. Fluid restriction is for chronic, non-emergency SIADH.

Very thirsty, passing large amounts of pale urine every hour, after pituitary surgery: diabetes insipidus. Report it.

3 EXAM ANCHORS

1. Low thyroid is cold and slow, with a high TSH if primary; high thyroid is hot and fast, with a low one.
2. Levothyroxine on an empty stomach, apart from calcium and iron.
3. Myxedema coma: cold and slow. Thyroid storm: fever and a racing heart.
4. After thyroid surgery: airway, blood behind the neck, calcium, and the voice.
5. Addison's: never skip replacement, follow the sick-day plan; crisis: injected hydrocortisone and saline.
6. Cushing's: usually from steroids, which are tapered, never stopped suddenly.
7. SIADH holds water and lowers sodium; DI loses water, and desmopressin treats the central type.

4 SELF-QUIZ

1. The hallmark of myxedema coma is _____.
2. After a thyroidectomy, the first priority is the _____.
3. Fludrocortisone replaces _____.
4. In Cushing's, a fat pad between the shoulders is a _____.
5. Central diabetes insipidus is treated with _____.
6. Pheochromocytoma: attacks of headache, palpitations, _____ and high blood pressure.

ANSWER KEY 1. hypothermia · 2. airway · 3. aldosterone · 4. buffalo hump · 5. desmopressin · 6. sweating

5 SOURCES

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