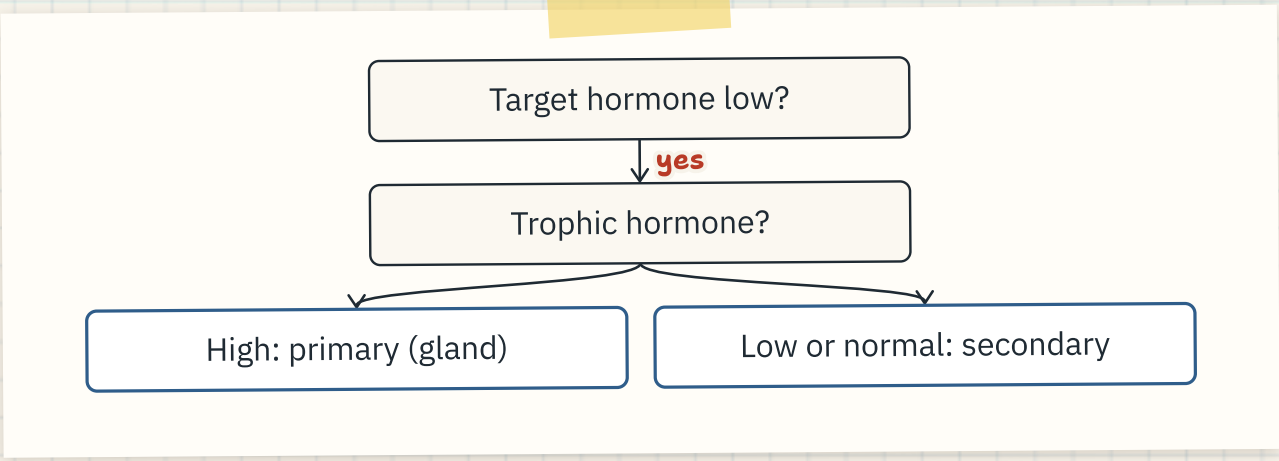
Primary vs secondary: two numbers

Classify the disorder from paired hormone levels



Step by step

1. Read the target hormone first
2. Then read the trophic hormone
3. Opposite directions: primary
4. Same direction: secondary
5. Normal trophic hormone beside low target: still secondary

Axis	Primary	Secondary
Adrenal	Cortisol low, ACTH high	Cortisol low, ACTH low or normal
Thyroid	Free T_4 low, TSH high	Free T_4 low, TSH low or normal
Gonadal	Testosterone low, LH/FSH high	Testosterone low, LH/FSH low or normal
Skin (adrenal)	Dark knuckles, elbows	Not darkened (often pale)
Potassium (adrenal)	High	Normal

Primary vs secondary patterns

Rule of thumb

Opposite = primary (gland)

Same direction = secondary (pituitary)

Tertiary (hypothalamus) looks like secondary

Exam traps

- A TSH in range with a low free T_4 is inappropriate, not reassuring.
- Aldosterone is driven mainly by renin–angiotensin and potassium, not ACTH, so it is spared in secondary failure.
- A damaged pituitary often fails on more than one axis.

For exam study only, not medical advice. Follow local guidelines and your lab's ranges.
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