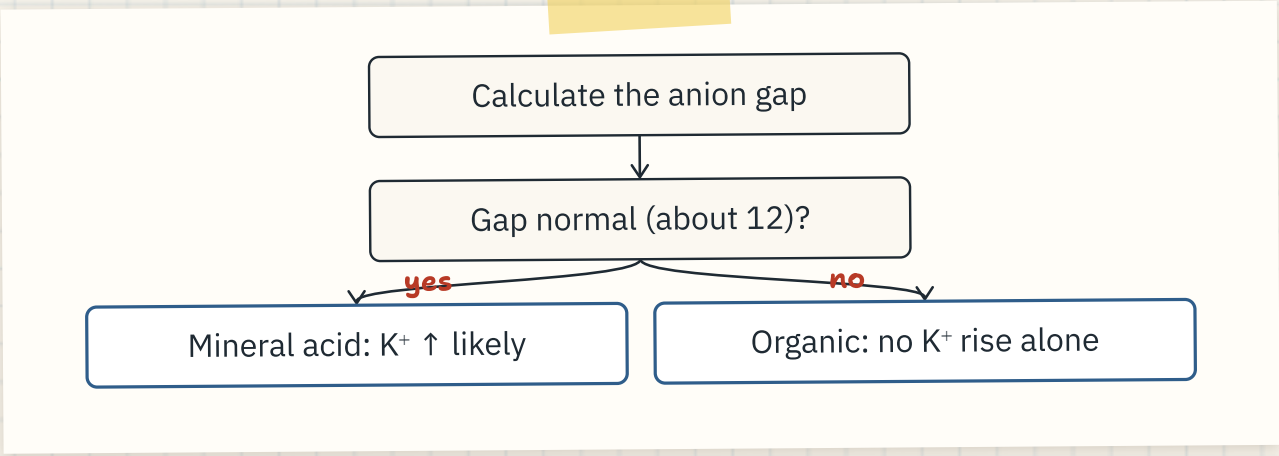
Acidosis and hyperkalemia

Potassium shifts and the type of acid



Step by step

1. Calculate the anion gap
2. Normal gap: mineral acid, K^+ more likely raised
3. High gap: organic acid, no K^+ rise by itself
4. Remember insulin lack in DKA

ANION GAP

$$Na^+ - (Cl^- + HCO_3^-)$$

Normal about 12 mEq/L; K^+ is not included

Factor	Effect on blood K^+
Insulin	Falls (into cells)
Beta-2 agonists	Falls (into cells)
Alkalemia	Falls (into cells)
Acidemia	Tends to rise (out of cells)
Beta blockers	Can rise a little

What shifts potassium

Rule of thumb

The pump moves K^+: insulin and beta-2 agonists in; acidemia out; beta blockers out a little

Mineral acid (normal gap) shifts K^+ more than organic acid (high gap)

The gap tells you which acid

Exam traps

- Do not apply a fixed K^+ change per 0.1 pH unit.
- DKA hyperkalemia comes more from insulin lack than from the acid.
- High anion gap acidosis does not by itself cause hyperkalemia.
- Respiratory disorders shift K^+ less than metabolic ones.

Acidosis and hyperkalemia: how pH shifts potassium

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/renal-acid-base/acidosis-hyperkalemia-potassium-shift

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