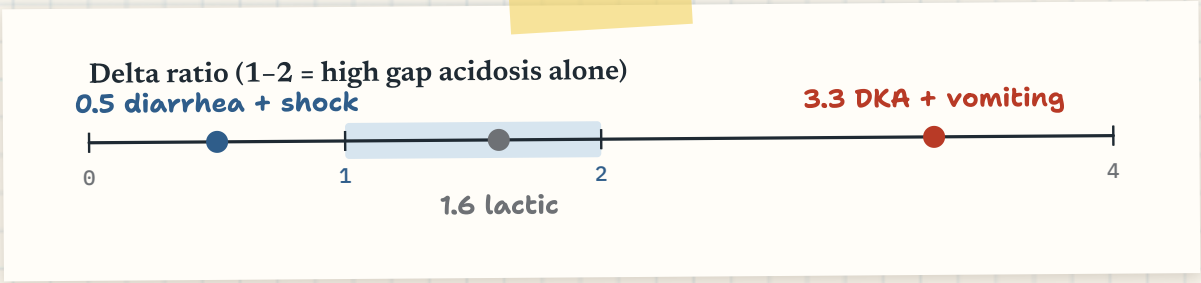
The delta ratio

Find the hidden second metabolic disorder



Step by step

1. pH: below 7.35 = acidemia
2. Primary disorder: acidemia + low HCO_3^- = metabolic acidosis
3. Anion gap: $Na^+ - (Cl^- + HCO_3^-)$; correct for low albumin
4. Winters': $1.5 \times HCO_3^- + 8 \pm 2$
5. Delta ratio

DELTA RATIO

$$(AG - 12) / (24 - HCO_3^-)$$

rise in the gap ÷ fall in bicarbonate, in a high anion gap acidosis

Delta ratio	Meaning
Below 1	+ normal anion gap acidosis
1–2	High anion gap acidosis alone (lactic ≈ 1.6, ketoacidosis ≈ 1)
Above 2	+ metabolic alkalosis (usually)

Reading the ratio

Rule of thumb

Below 1: add a normal gap acidosis

Above 2: add a metabolic alkalosis

Low albumin: lower the expected gap by 2.5 per 1 g/dL fall

Exam traps

- Cut-offs differ: some sources use 0.8–2 as pure and 0.4–0.8 as mixed; some use 25 for HCO_3^-.
- Your lab's normal anion gap may be lower than 12.
- A high ratio can also mean a compensated chronic respiratory acidosis.
- The ratio varies widely between patients: a clue, not a verdict.

Delta ratio: find the hidden second acid–base disorder

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/renal-acid-base/delta-ratio

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