POCKET INTENSIVIST: ACID-BASE 2.0

ICUedu

STATE

- pH: Normal vs Acidemic vs Alkalemic

PROCESS

- Respiratory: Interpret the CO_2 in the context of the HCO_3
- Metabolic: Interpret the HCO_3 in the context of the anion gap (AG) and strong ion difference (SID)

STORY

- Most likely explanation for numbers given clinical context

Applies to VBGs, but need to convert to equivalent ABG numbers:

- VBG pH + 0.05 = ABG pH
- VBG CO_2 - 5 = ABG CO_2

Example: VBG 7.35/45/40/24 → ABG 7.40/40/80/24

RESPIRATORY PROCESS

Low HCO_3 → Think about respiratory compensation in acute metabolic acidosis

- CO_2 = Last two digits of pH (eg: 7.<u>24</u>/<u>24</u>/80/10)

High HCO_3 → Think about baseline CO_2 in chronic respiratory acidosis

- For every 4 the HCO_3 is above normal (24), the CO_2 is 10 above normal (40)

METABOLIC PROCESS

High AG Acidosis (Na - Cl - HCO3 >12-16)

- Lactic acidosis, Ketoacidosis, Renal Failure, Toxins

Low SID Acidosis (Na - Cl <38)

- Normal saline, Diarrhea, Post-DKA, Renal tubular acidosis

High SID Alkalosis (Na - Cl >38)

- Vomiting, Diuretics, Volume contraction, Respiratory acidosis compensation

Multiple metabolic (△/△): If AG is increased, is HCO_3 decreased by same amount?

- HCO_3 disproportionately high → Concomitant metabolic alkalosis
- HCO_3 disproportionately low → Concomitant non-AG metabolic acidosis