Practical ABG Interpretation Steps

***intended to be used as a GUIDE**

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pH = 7.4
pCO_2 = 40 mm Hg
HCO^{3-} = 24 mEq/L

1. Look at the **pH**
    a. pH < 7.4 = Acidosis
    b. pH > 7.4 = Alkalosis
2. Determine Primary Disorder = Look at **PCO_2 and pH**
    a. If pH and PCO_2 move in *opposite* directions, respiratory disorder is primary
    b. If pH and PCO_2 move in the *same* direction, metabolic disorder is primary
3. Look for Mixed Disorder = Look at **pCO_2 and HCO_3** (BMP panel more accurate than ABG) *this step may confirm what you've already found in steps 1-2 if no mixed disorder present*
    a. If both pCO_2 and HCO_3 are *high* = respiratory acidosis OR metabolic alkalosis
    b. If both pCO_2 and HCO_3 are *low* = respiratory alkalosis OR metabolic acidosis
    c. If pCO_2 and HCO3 move in *opposite* direction = mixed disorder is present
4. Look for expected compensatory change/Apply compensation rules
    a. **Respiratory Rule #1** = pH changes by 0.08 for 10 mmHg pCO_2 change in either direction
        i. In ACUTE situations only…DO NOT USE IT IN CHRONIC CASES. Usually, in chronic situations pH corrects/compensates to normal
    b. Boston Rule
        i. Acute Respiratory Acidosis: 1 for 10 rule (1 mEq HCO_3 change for 10 mmHg pCO_2)
        ii. Acute Respiratory Alkalosis: 2 for 10 rule (2 mEq HCO_3 change for 10 mmHg pCO_2)
        iii. Chronic Respiratory Acidosis: 4 for 10 rule (4 mEq HCO_3 change for 10 mmHg pCO_2)
        iv. Chronic Respiratory Alkalosis: 5 for 10 rule (5 mEq HCO_3 change for 10 mmHg pCO_2)
    c. **Winter's Formula = (1.5 x HCO_3) +8 (+/- 2)** – use for metabolic acidosis
    d. 0.7 x HCO_3 + 20 (+/- 5) (rarely used) – use for metabolic alkalosis
5. Compare Calculated to Corrected Anion Gap
    a. Calculated AG = (Na + K) – (Cl + HCO_3)
    b. Corrected AG = (2 x albumin) + (0.5 x phosphate) +/- 2
        i. Alternatively, Corrected AG = 3 x albumin
        ii. Pay attention to the Corrected AG when phos or albumin are low
    c. If calculated AG > corrected AG = <u>high anion gap acidosis</u> is present
6. Calculate **Delta Gap = (calculated AG – corrected AG) + HCO_3** in the presence of HAGMA to determine if coexisting disorder present
    a. If net sum = 24, only HAGMA present
    b. If net sum < 24 = NAGMA also present
        i. <u>NAGMA:</u> usually RTA, diarrhea, hyperchloremia
    c. If net sum > 24 = metabolic alkalosis also present