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Acid-Base, Fluids, Lytes Pocketcard Set

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Acid-Base Disorders Basics

	Normal range		Simple acid-base disorders			
	Arterial	Venous	Met acid	Resp acid	Met alk	Resp alk
pH	7.38-7.44	7.35-7.43	7.35	7.35	7.45	7.45
pCO ₂	38-44 mmHg	36-40 mmHg	40	50	30	30
HCO ₃ ⁻	22-27 mEq/L	23-29 mEq/L	12	26	30	30
pO ₂	75-100 mmHg	37-47 mmHg				
O ₂ sat	>95%	90%-95%				
BE	-2 to 3					
Examples	- Diarrhea - CHF - Diabetes - CO2P - Resp distress - Starvation - Hypernat - PE					

Algorithm for Determining Acid-Base Status

Measure blood pH, HCO₃⁻, PaCO₂, Na⁺, and Cl⁻

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graph TD
    Root["Measure blood pH, HCO3-, PaCO2, Na+, and Cl-"]
    Root --> pH738["pH < 7.38 (Acidemia)"]
    Root --> pH738_744["pH 7.38-7.44 (Normal)"]
    Root --> pH744["pH > 7.44 (Alkalemia)"]

    pH738 --> HCO3_22["Arterial HCO3- < 22 mEq/L"]
    pH738 --> HCO3_23_29["Arterial HCO3- 23-29 mEq/L"]
    pH738 --> PaCO2_40["Arterial PaCO2 > 40 mmHg"]
    pH738 --> PaCO2_37_47["Arterial PaCO2 37-47 mmHg"]

    HCO3_22 --> MetAcid["Metabolic Acidosis"]
    HCO3_23_29 --> RespAcid["Respiratory Acidosis"]
    PaCO2_40 --> MetAlk["Metabolic Alkalosis"]
    PaCO2_37_47 --> RespAlk["Respiratory Alkalosis"]

    MetAcid --> CompMetAcid["Compensation: PaCO2 ↓ 1.2 mmHg for every 10 mEq/L fall in HCO3-"]
    RespAcid --> CompRespAcid["Compensation: HCO3- ↑ 1 mEq/L for each 10 mmHg ↑ PaCO2"]
    MetAlk --> CompMetAlk["Compensation: PaCO2 ↑ 0.7 mmHg for every 10 mEq/L rise in HCO3-"]
    RespAlk --> CompRespAlk["Compensation: HCO3- ↓ 2 mEq/L for each 10 mmHg ↓ PaCO2"]

    CompMetAcid --> CalcAG["Calculate Anion Gap (AG)"]
    CalcAG --> CausesNonAG["Causes of non-anion gap metabolic acidosis"]
    CausesNonAG --> DR["DR, BOPRUS (see anion gap resources)"]
    CausesNonAG --> B["B - Diarrhea (loss of HCO3- in stool), Renal tubular acidosis (RTA)"]
    CausesNonAG --> D["D - Drugs (anticholinergics or tricyclics), B - Bile (loss of HCO3- in stool), O - Osmotic (loss of HCO3- in stool), R - Renal tubular acidosis (RTA), U - Urinary (loss of HCO3- in stool), S - Sulfonamides (loss of HCO3- in stool)"]

    CompRespAcid --> CausesAG["Causes of anion gap metabolic acidosis"]
    CausesAG --> DR_MAPLES["DR, MAPLES (see anion gap resources)"]
    CausesAG --> D["D - Diabetic ketoacidosis, L - Lactic acid, P - Pseudotumor cerebri (lactic acid), E - Ethylene glycol, S - Sulfonamides (loss of HCO3- in stool)"]
    CausesAG --> M["M - Methanol"]
    CausesAG --> A["A - Anion gap (lactic acid)"]
    CausesAG --> P["P - Pseudotumor cerebri (lactic acid), Pseudotumor cerebri (lactic acid), Pseudotumor cerebri (lactic acid)"]
    CausesAG --> L["L - Lactic acid"]
    CausesAG --> E["E - Ethylene glycol, Ethanol metabolism"]
    CausesAG --> S["S - Sulfonamides (loss of HCO3- in stool)"]

    CompMetAlk --> CausesNonAG_alk["Causes of non-anion gap metabolic alkalosis"]
    CausesNonAG_alk --> DR_alk["DR, BOPRUS (see anion gap resources)"]
    CausesNonAG_alk --> B_alk["B - Diarrhea (loss of HCO3- in stool), Renal tubular acidosis (RTA)"]
    CausesNonAG_alk --> D_alk["D - Drugs (anticholinergics or tricyclics), B - Bile (loss of HCO3- in stool), O - Osmotic (loss of HCO3- in stool), R - Renal tubular acidosis (RTA), U - Urinary (loss of HCO3- in stool), S - Sulfonamides (loss of HCO3- in stool)"]

    CompRespAlk --> CausesAG_alk["Causes of anion gap metabolic alkalosis"]
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    CausesAG_alk --> D_alk["D - Diabetic ketoacidosis, L - Lactic acid, P - Pseudotumor cerebri (lactic acid), E - Ethylene glycol, S - Sulfonamides (loss of HCO3- in stool)"]
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Normal values: pH = 7.38-7.44, PaCO₂ = 38-44 mmHg, HCO₃⁻ = 22-27 mEq/L, BE = -2 to 3 mEq/L, O₂ sat = 95-100%.

Causes of anion gap metabolic acidosis are categorically asymptomatic in the process, a gradual and compensatory increase in the anion gap (AG) is normal (AG = 12-16 mEq/L).

Causes of non-anion gap metabolic acidosis are usually symptomatic due to loss of bicarbonate (HCO₃⁻) in stool and/or urine.

Symptoms may include headache, muscle aches, weakness, nausea, and/or vomiting, especially with increasing severity (AG).

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not much useful, i am in nephrology, i thought this will give a quick step by step approach to acid base problems, but its only some random acid base formulas. May be good for med students, for me its almost useless.

Good for quick review

Pocket size - great.

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