Imbalance:	Findings:	What does this mean?	What causes this?	Signs & Symptoms	How do we fix it?
Respiratory Acidosis	pH: ↓ PaCO₂: ↑ HCO₃: Normal or ↑ with compensation	↓ alveolar ventilation relative to the rate of CO_2 production, thus ↑ carbonic acid.	COPD, over sedation, Pickwickian syndrome, airway obstruction, neuromuscular disorders, & **hypoventilation.**	HA, tremors, confusion, lethargy, coma, & arrhythmias.	Treat the underlying cause. ↑ **Depth and rate of ventilation**.
Respiratory Alkalosis	pH: ↑ PaCO₂: ↓ HCO₃: Normal or ↓ with compensation	↑ alveolar ventilation relative to the rate of CO_2 produced.	Hypoxia, psychogenic **hyperventilation**, Salicylate OD, CHF, hepatic coma, fever, brain lesion.	Numbness, tingling of extremities, carpal pedal spasms, vertigo, & arrhythmias.	Treat the underlying cause. **Rebreathing bag or sedation**. ↓ **respiratory rate, ↓ tidal volume**.
Metabolic Acidosis	pH: ↓ HCO₃: ↓ PaCO₂: Normal or ↓ with compensation	Physiologic process characterized by: the gain of H^+ ions or the loss of HCO_3 ions.	**GAIN:** **DKA**, Poisoning, lactic acidosis, renal failure. **LOSS:** **diarrhea**, pancreatic drainage, renal tubular disease.	Hypotension, nausea/vomiting, lethargy, coma, Kussmaul's respiratory, arrhythmias.	Treat the underlying cause. pH: 7.2 = ? IV HCO_3 and recheck ABGs.
Metabolic Alkalosis	pH: ↑ HCO₃: ↑ PaCO₃: Normal or ↑ with compensation	Primary gain of HCO_3 or loss of H^+,	**Diuretics, vomiting, NGT drainage**, corticosteroids, Cushing syndrome, blood transfusions, overdose on $NaHCO_3$.	Nausea, vomiting, diarrhea, convulsions, tremors, arrhythmias, changes in sensorium	Treat the underlying cause.

ROME = Respiratory Opposite, Metabolic Equal.

pH: acidic < 7.35 – 7.45 > alkalotic (b)
PaCO₂: (b) < 35 – 45 > (a)
HCO⁻₃: (a) < 22 – 26 > (b)
PaO₂: 80 – 100
SaO₂: 95 – 100%

PaO₂
Normal: 80-100
Mild Hypoxemia: 70-80
Moderate Hypoxemia: 60-70
Severe Hypoxemia: <60

Respiratory Acidosis: ↑ PaCO₂ - ↓ pH
Treatment: ↑RR , ↑Vt on the ventilator

Compensates for

Metabolic Alkalosis: ↑ HCO₃ - ↑ pH

Respiratory Alkalosis: ↓ PaCO₂ - ↑ pH
Treatment: ↓RR, ↓Vt on the ventilator

Compensates for

Metabolic Acidosis: ↓ HCO₃ - ↓ pH