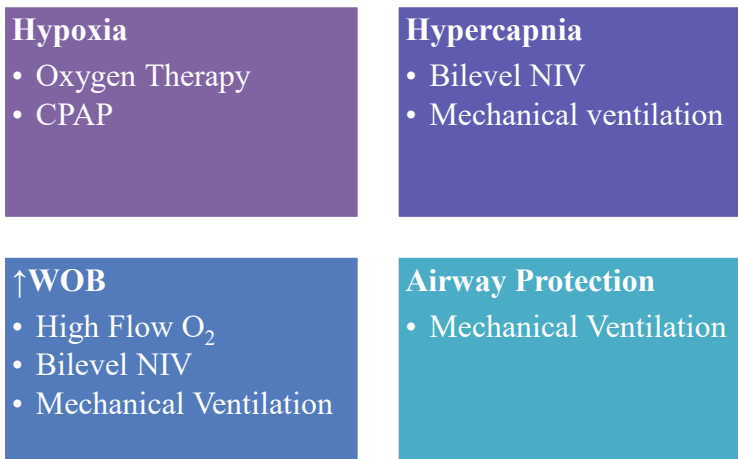


ABG/Ventilation Workshop Handout

Respiratory dysfunction differentials:

1. Acidosis: CNS depression, hypoventilation, sedatives, pulmonary issues (↑dead space)
2. Alkalosis: CNS stimulation, pain, agitation, drugs, hypoxia, sepsis, pregnancy, liver failure, thyroid

Intervention selection:



ABG analysis:

1. pH
 - < 7.4: Acidosis
 - > 7.4: Alkalosis
 - = 7.4: normal or mixed disorder
2. pCO₂ and HCO₃
 - a. both high: resp. acidosis or metabolic alkalosis
 - b. both low: resp. alkalosis or metabolic acidosis
 - c. opposite directions: mixed disorder
3. Calculate Compensation
 - a. pH changes by 0.08 q10 mmHg pCO₂ change in either direction ACUTE ONLY
 - b. Acute Respiratory Acidosis: 1 for 10 rule (1 mEq HCO₃ change for 10 mmHg pCO₂)
 - c. Acute Respiratory Alkalosis: 2 for 10 rule (2 mEq HCO₃ change for 10 mmHg pCO₂)
 - d. Chronic Respiratory Acidosis: 4 for 10 rule (4 mEq HCO₃ change for 10 mmHg pCO₂)
 - e. Chronic Respiratory Alkalosis: 5 for 10 rule (5 mEq HCO₃ change for 10 mmHg pCO₂)
 - f. Metabolic Acidosis: Winter's Formula = $(1.5 \times \text{HCO}_3) + 8 \pm 2$
 - g. Metabolic Alkalosis: $0.7 \times \text{HCO}_3 + 20 \pm 5$ (rarely used)

4. Optional: Calculated to corrected Anion Gap

- a. Calculated AG = $(Na) - (Cl + HCO_3)$
- b. Corrected AG = $(2 \times \text{albumin}) + (0.5 \times \text{phosphate}) \pm 2$
 - i. Alternatively, corrected AG = $3 \times \text{albumin}$
- c. If calculated AG > corrAG = **high anion gap acidosis** is present
 - i. **MUDPILES**: Methanol, Uremia, DKA, Propylene Glycol (a solvent in drugs like Ativan and Phenytoin), Iron/Isoniazid, Lactate, Ethanol/Ethylene Glycol, Salicylate/Starvation
- d. Delta Gap = $(\text{calculated AG} - \text{corrAG}) + HCO_3$
 - i. If sum < 24 = NAGMA present
 1. **NAGMA**: usually RTA, diarrhea, hyperchloremia
 - ii. If sum > 24 = additional metabolic alkalosis present
 1. **Metabolic Alkalosis**: GI losses, NG suction, diuretics, potassium depletion, Cushing's, or Bartter Syndrome

