Friday, 3 May 2024 6:38 PM

* Resp. failure:

- **Type 1**:Arterial oxygen tension **(PaO_2) lower than 60 mm Hg** with a **normal or low** arterial carbon dioxide tension **($PaCO_2$)** → ↓ hv → ↓ V/Q → ↓ PaO_2
- **Type 2**:Hypercapnic respiratory failure is characterized by a **$PaCO_2$ higher than 50** mm Hg and arterial oxygen tension (PaO_2) lower than 60 mm Hg. → ↓ hv → ↓ O_2 → ↓ PaO_2

- The only reason for ↑$PACO_2$ is hypoventilation
- normal V/Q ratio → 0.8 → if <0.8 → ↓ ventilation or ↑ perfusion
  → if >0.8 → ↑ ventilation or ↓ perfusion (exp. pulmonary embolism)
- diffusion impairment → ↓ surface area (emphysema)
  → ↑ thickness of alveolar membranes (Fibrosis, RLD)
- ↑ altitude → ↓ barometric pressure → ↓ PaO_2

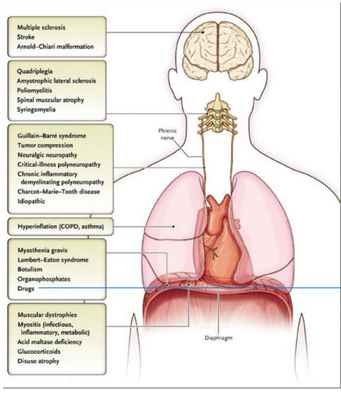
- When a person **suddenly ascends to the high altitude**, the body responds to the hypoxemia by hyperventilation, causing **respiratory alkalosis**. The concentrations of **2, 3-diphosphoglycerate** (DPG) are increased, shifting the oxygen-hemoglobin dissociation curve to the right.
- Chronically, the acclimatization takes place, and the body responds by increasing the oxygen-carrying capacity of the blood (**polycythemia**). The kidneys excrete bicarbonates and maintain the pH within normal limits.

Causes of Hypoxemia

Cause	PaO_2	A-a gradient	PaO_2 response to supplemental oxygen
Hypoventilation	Decreased	Normal	Increases
Diffusion Impairment	Decreased	Increased	Increases
Shunt	Decreased	Increased	Does not increase.
V/Q Mismatch	Decreased	Increased	Usually increases (depends on V/Q mismatch type)
High Altitude	Decreased	Normal	Increases

↑CO_2 ↓CO_2 ↓CO_2 ↓CO_2 ↓CO_2

* hypoxic pt. , O_2 sat 85% :
① calculate ABG
② A-a gradient
③



① opioids → ↓ antidote → naloxone
② benzodiazepine → ↓ antidote → Flumazenil

Acute respiratory distress syndrome (ARDS)

no so don't tx by lasix

- A rapidly progressive **noncardiogenic pulmonary edema** that initially manifests as dyspnea, tachypnea, and hypoxemia, then quickly evolves into respiratory failure.
- **These criteria** are based on timing of symptom onset (within one week of known clinical insult or new or worsening respiratory symptoms)
- Bilateral opacities on chest imaging that are not fully explained by effusions, lobar or lung collapse, or nodules;
- The likely source of pulmonary edema (respiratory failure not fully explained by cardiac failure of fluid overload);
- Oxygenation as measured by the ratio of partial pressure of arterial oxygen (Pao2) to fraction of inspired oxygen (Fio2).

200-300

- **Mild**: 200 mm Hg < Pao2/Fio2 ratio ≤ 300 mm Hg with positive end-expiratory pressure (PEEP) or continuous positive airway pressure ≥ 5 cm H2O.

100-200

- **Moderate**: 100 mm Hg < Pao2/Fio2 ratio ≤ 200 mm Hg with PEEP ≥ 5 cm H2O.

≤100

- **Severe**: Pao2/Fio2 ratio ≤ 100 mm Hg with PEEP ≥ 5 cm H2O.

Tx:

- supportive and includes:
- **mechanical ventilation**, prophylaxis for stress ulcers and venous thromboembolism, nutritional support, and treatment of the underlying injury.
- Low tidal volume and high positive end-expiratory pressure improve outcomes.
- Prone positioning is recommended for some moderate and all severe cases.
- As patients with ARDS improve and the underlying illness resolves, a spontaneous breathing trial is indicated to assess eligibility for ventilator weaning.