

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا

الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ

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Respiratory Failure

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Definition

Respiratory failure describes a set of conditions impairing delivery of oxygen to the tissues or removal of carbon dioxide from the tissues.

$\text{PaO}_2 < 60 \text{ mmHg} \pm \text{PaCO}_2 > 50 \text{ mmHg}$

Types

Type 1: hypoxic respiratory failure (Impaired diffusion, perfusion, shunt or V/Q mismatch).

Type 2 hypercapnic respiratory failure (Hypoventilation).

Type 3: postoperative respiratory failure (Atelectasis).

Type 4: circulatory shock-associated respiratory failure (Hypoperfusion)

Causes

Type I respiratory failure

- Pneumonia
- Cardiogenic pulmonary edema
- Non - cardiogenic pulmonary edema (ARDS) -Pulmonary embolism
- Pulmonary fibrosis Pulmonary fibrosis

Causes

Type II respiratory failure

- Central hypoventilation
- COPD
- Neuromuscular and chest wall disorders
- Obesity Hypoventilation Syndrome

Causes

Type III respiratory failure

- Inadequate post - operative analgesia, upper abdominal incision
- Obesity, ascites
- Excessive airway secretions

Type IV respiratory failure

- Cardiogenic shock,Septic shock or Hypovolemic shock

Clinical Presentation

-Acute ,Chronic orAcute on top of Chronic

-C\P of the cause

Hypoxia;

Tachypnea,Cyanosis

Clubbing

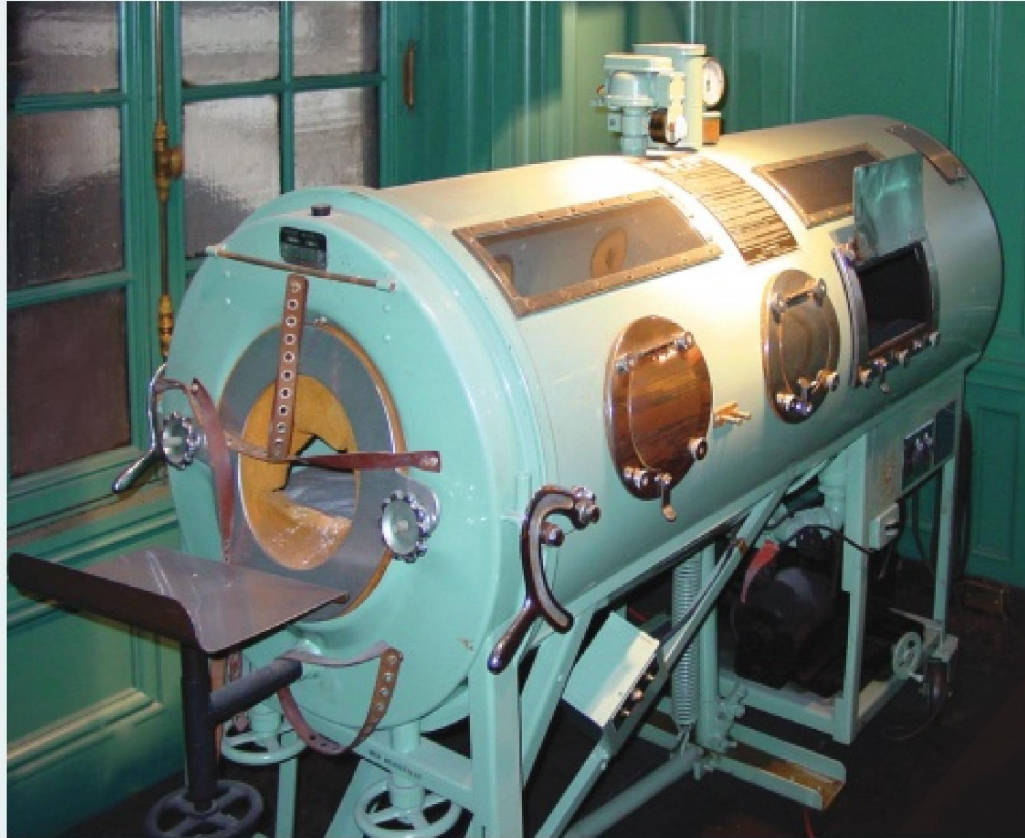
Hypercapnea;

Confusion,Asterxis

Papillodema

Investigations

- ABG
- CXR
- PFT
- CT Chest
- of the cause



"Iron lungs" were the first ventilators used on a wide basis for the polio epidemic in the 1950s. They created an intermittent negative pressure around the chest so the lungs would expand and breathe.

Management

- ABC
- O₂
- Mechanical Ventilation
- of the cause

ARDS

Acute Respiratory Distress Syndrome (ARDS) is defined as an acute inflammatory syndrome that accompanied with increased permeability of the alveolar-capillary membrane.

ARDS

Table 2. Common risk factors for ARDS

Direct	Indirect
Pneumonia	Non-pulmonary sepsis
Aspiration of gastric contents	Major trauma
Inhalational injury	Pancreatitis
Pulmonary contusion	Severe burns
Pulmonary vasculitis	Non-cardiogenic shock
Drowning	Drug overdose
	Multiple transfusions or transfusion associated acute lung injury (TRALI)

ARDS

Table 1. ARDS Berlin definition.

The Berlin definition of acute respiratory distress syndrome	
Timing	Within 1 week of a known clinical insult or new or worsening respiratory symptoms
Chest imaging ^a	Bilateral opacities — not fully explained by effusions, lobar/lung collapse, or nodules
Origin of edema	Respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic edema if no risk factor present
Oxygenation ^b	
Mild	$200 \text{ mmHg} < \text{PaO}_2/\text{FIO}_2 \leq 300 \text{ mmHg}$ with PEEP or CPAP $\geq 5 \text{ cmH}_2\text{O}^c$
Moderate	$100 \text{ mmHg} < \text{PaO}_2/\text{FIO}_2 \leq 200 \text{ mmHg}$ with PEEP $\geq 5 \text{ cmH}_2\text{O}$
Severe	$\text{PaO}_2/\text{FIO}_2 \leq 100 \text{ mmHg}$ with PEEP $\geq 5 \text{ cmH}_2\text{O}$

Abbreviations: CPAP, continuous positive airway pressure; FIO_2 , fraction of inspired oxygen; PaO_2 , partial pressure of arterial oxygen; PEEP, positive end-expiratory pressure; ^aChest radiograph or computed tomography scan; ^bIf altitude is higher than 1,000 m, the correction factor should be calculated as follows: $[\text{PaO}_2/\text{FIO}_2 \text{ (barometric pressure/760)}]$; ^cThis may be delivered noninvasively in the mild acute respiratory distress syndrome group.

ARDS

Management;

- treatment of the cause
- Ventilatory Support (ECMO)
- NO inhalation, Diuretics,....etc



Thank You!

