



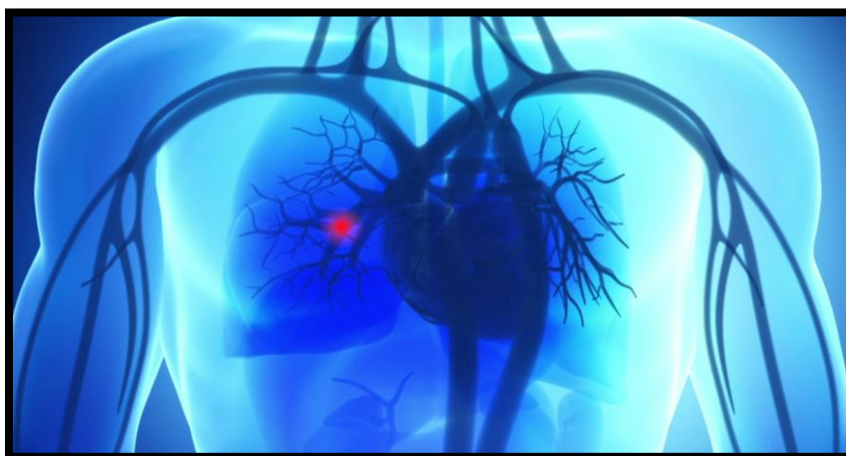
Respiratory failure

- Respiratory failure exists whenever the exchange of O₂ for CO₂ in the lungs cannot keep up with the rate of O₂ consumption & CO₂ production in the cells of the body. This results in a fall in arterial O₂ tension (hypoxemia) and a rise in arterial CO₂ tension (Hypercapnia).
- Respiratory failure is considered acute if the lungs are unable to maintain adequate oxygenation in a previously healthy person, with or without an impairment of carbon dioxide elimination and the lung usually returns to its normal original states, But in chronic respiratory failure the structure damage is irreversible.

Causes of Acute Respiratory Failure (ARF)

A- Intrapulmonary:

- Lower airway and alveoli diseases (COPD, Asthma, Pneumonia)
- Pulmonary Circulation: {**Pulmonary Embolism**} is a blood clot that develops in a blood vessel in the body (often in the leg). It then travels to a lung artery where it suddenly blocks blood flow.



Pulmonary Embolism



Department of Anesthesia Techniques
Title of the lecture:-Respiratory Failure

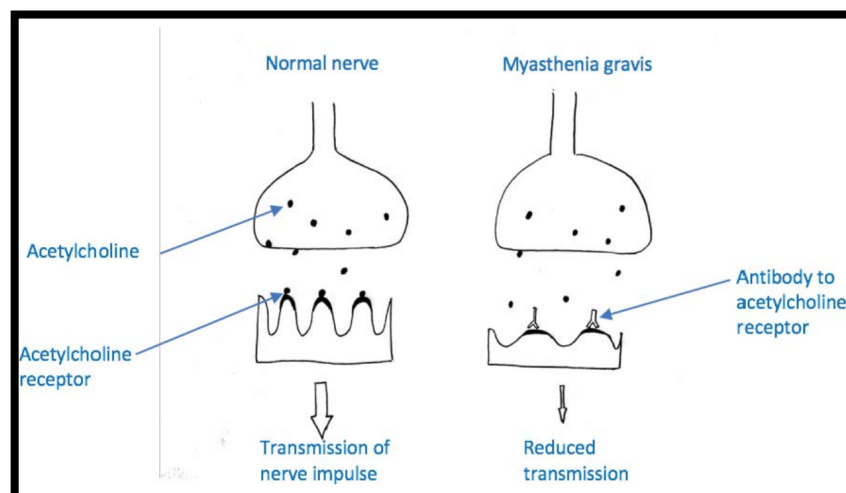
Dr.Sura A. Awadh
sura.abdailahalek@mustaqbal-college.edu.iq



- Alveolar capillary membrane (Acute respiratory distress syndrome (ARDS), inhalation of toxic gases, near drowning, drug overdose)
- ARDS : is a type of respiratory failure characterized by rapid onset of widespread inflammation in the lungs.

B- Extrapulmonary:

- Brain (e.g. Drug overdose)
- Spinal Cord(e.g. Guillain-Barré syndrome (GBS) is a rare, autoimmune disorder in which a person's own immune system damages the nerves,)
- Neuromuscular system(e.g. Myasthenia gravis (MG) is a chronic autoimmune disorder in which antibodies destroy the communication between nerves and muscle, resulting in weakness of the skeletal muscles)



- Thorax(e.g. Massive obesity)
- Pleura (e.g. Pleural effusion sometimes referred to as “water on the lungs,” is the build-up of excess fluid between the layers of the pleura outside the lungs.)
- Upper airway Obstruction(e.g. Sleep apnea : is a serious sleep disorder that happens when a person's breathing is interrupted during sleep.)



Classification of acute respiratory failure

- ❖ According to the pattern of blood gas abnormality:

1- Type I Hypoxaemic respiratory failure

In which the PaO₂ is less than 50 mmHg and the PaCO₂ is normal or low.

The major pathophysiologic mechanisms causing hypoxaemic respiratory failure usually is a combination of ventilation- perfusion (V/Q) mismatching and shunting

2- Type II Hypercapnic/ Hypoxaemic respiratory failure

- In which the PaCO₂ >45mmHg, accompanied by a lower than normal PaO₂
- Pathophysiology caused by alveolar hypoventilation

Chronic respiratory failure

- Is an ongoing condition. It gradually develops over time and requires long-term treatment.
- Chronic respiratory failure usually happens when the airways that carry air to your lungs become narrow and damaged. This limits air movement through the body, which means that less oxygen gets in and less carbon dioxide gets out.

❖ Chronic respiratory failure can also be classified as **hypoxemic** or **hypercapnic** respiratory failure.

- Low blood oxygen levels cause hypoxemic respiratory failure.
- High carbon dioxide levels cause hypercapnic respiratory failure
- Symptoms of chronic respiratory failure may not be noticeable at first. They usually occur slowly over an extended period of time.



When symptoms do develop, they may include :

- Difficulty breathing especially when active
- Coughing up mucous
- Wheezing
- Bluish tint to the skin, lips, or fingernails
- Rapid breathing
- Anxiety
- Confusion
- Daily headache
- People may develop an abnormal heart rhythm, stop breathing, or
- Slip into a coma

Causes Chronic Respiratory Failure

- Certain lung diseases can cause chronic respiratory failure. Conditions that affect the way in which the brain, muscles, bones, or surrounding tissues support breathing can also cause chronic respiratory failure.
- Diseases and conditions that commonly lead to chronic respiratory failure include:
 - COPD
 - Complicated pneumonia
 - Cystic fibrosis
 - Spinal cord injuries
 - Stroke
 - Muscular dystrophy
 - Injury to the chest
 - Drug or alcohol misuse
 - Smoking