



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIO PULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME : PRINCIPLES OF PERFUSION TECHNOLOGY

II YEAR

UNIT II: PATHOLOGY OF LUNG

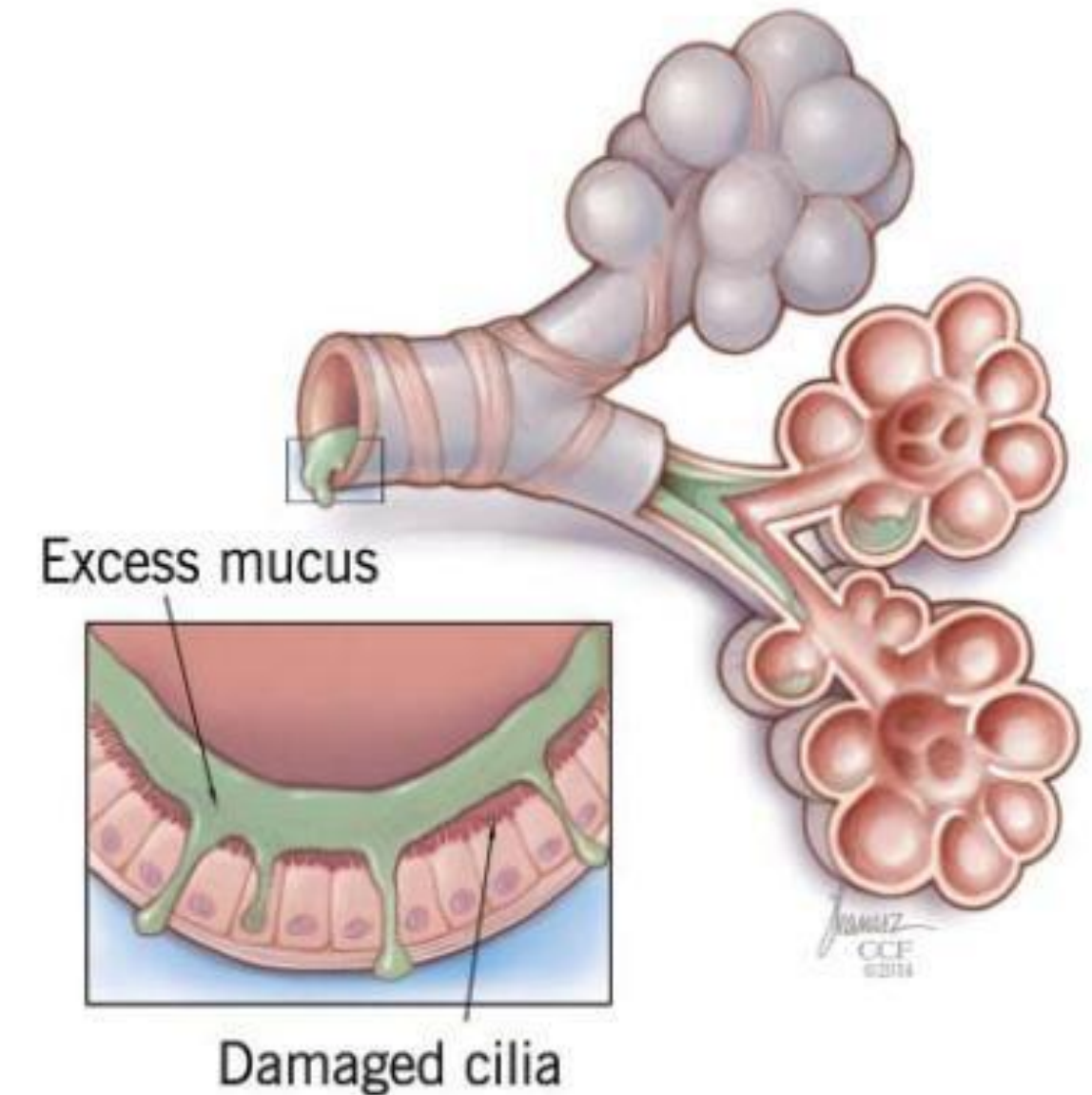
TOPIC : CHRONIC OBSTRUCTIVE PULMONARY DISEASE



Chronic Obstructive Pulmonary Disease



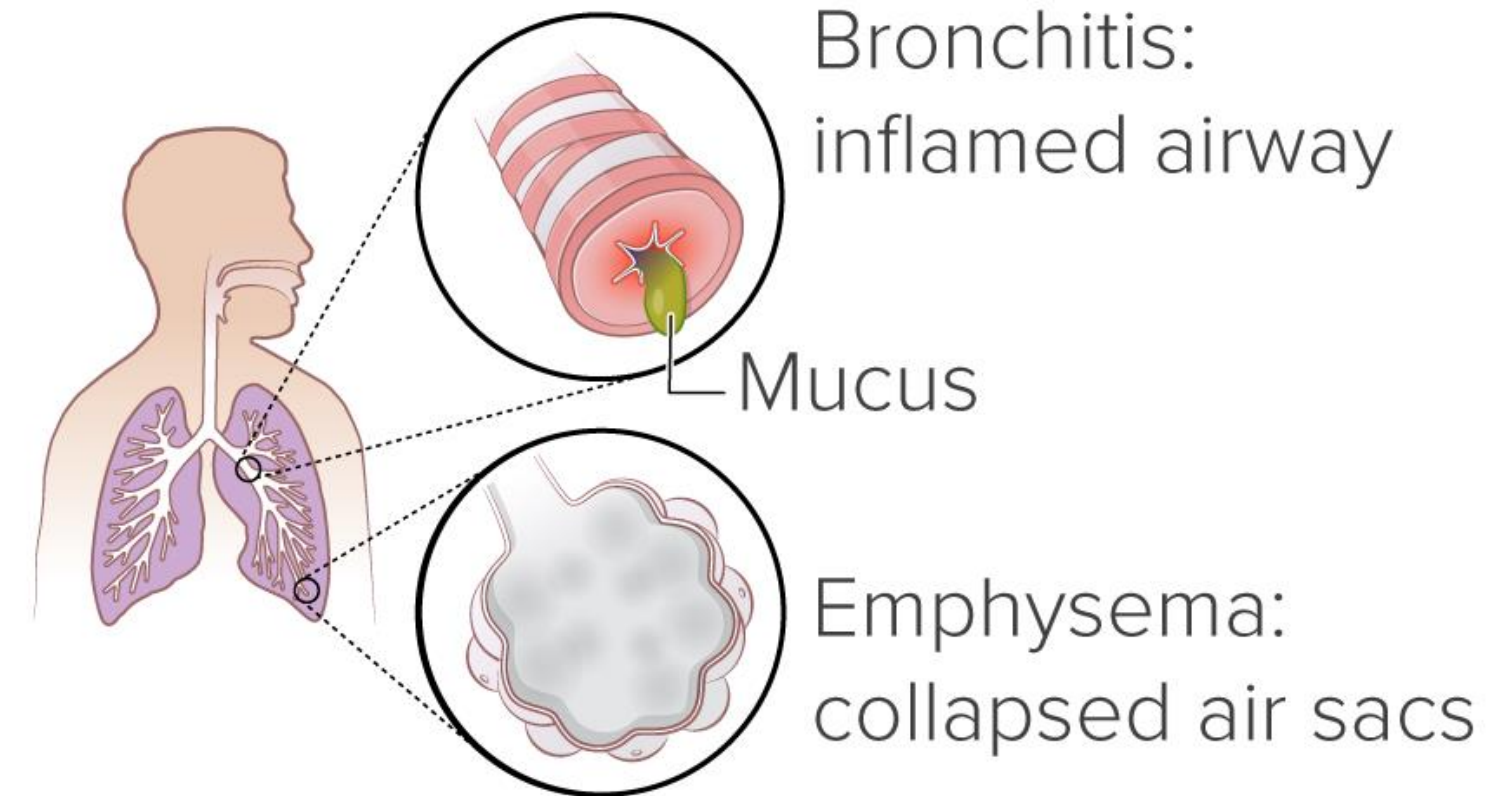
- COPD – **C**hronic **O**bstructive **P**ulmonary **D**isease
- COPD is a serious lung disease that makes it hard to breathe
- Airways are partially blocked, makes it difficult to breathe
- COPD is also known as Chronic Obstructive Lung Disease (**COLD**), Chronic Obstructive Airway Disease (**COAD**), Chronic Airway Limitation (**CAL**)



Types of COPD

- Chronic Bronchitis
- Emphysema

Lungs with COPD

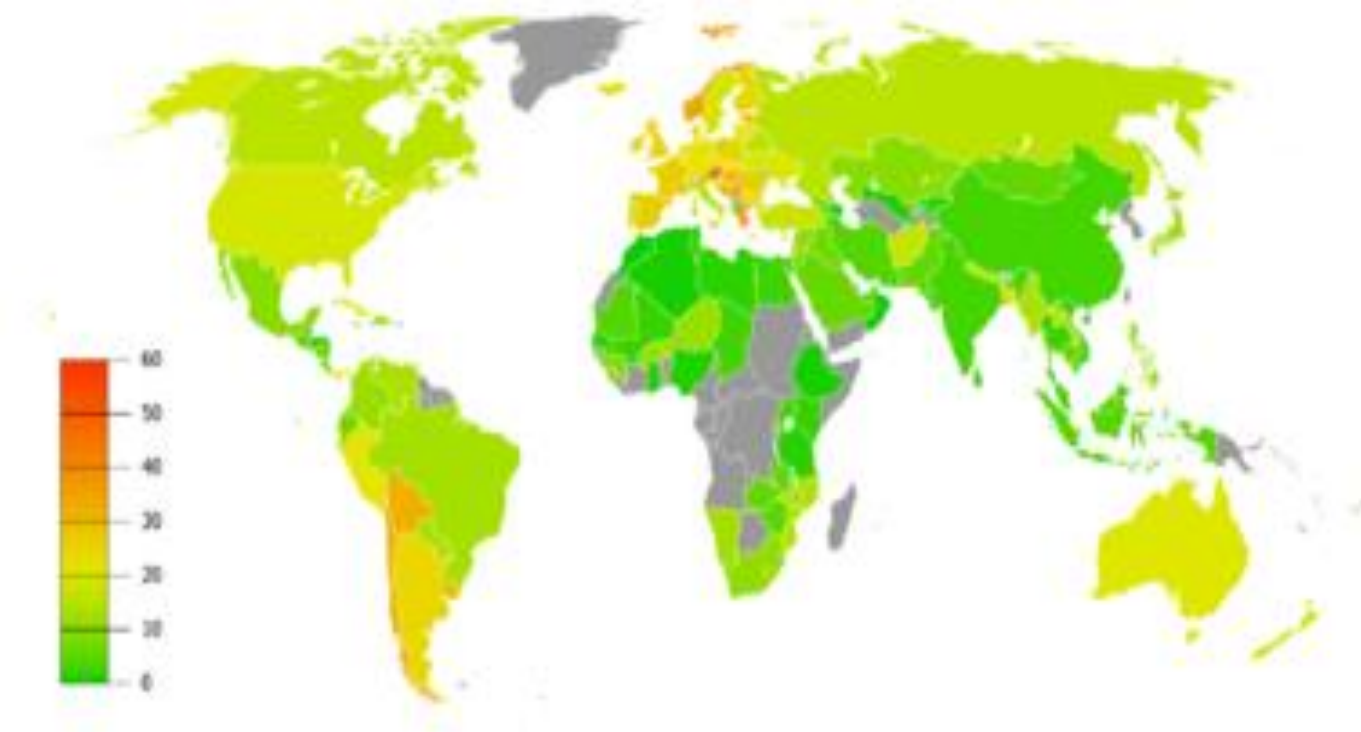




Epidemiology



- Chronic Obstructive Pulmonary Disease (COPD) kills more than 3 million people every year, making it the **4th largest cause of death in the world.**
- It has been estimated that by the year 2030, COPD will become the third biggest cause of death.
- According to the World Health Organisation, COPD kills more people than HIV-AIDS, Malaria and Tuberculosis





Causes



- Smoking
- Occupational Exposure
- Air Pollution
- Sudden airway constriction in response to inhaled irritants
- Bronchial Hyper responsiveness because of Asthma
- Genetics – Alpha 1 – antitrypsin deficiency





Pathophysiology

Abnormal inflammatory response of the lung due to toxic gases



Response occurs in the airways, parenchyma and pulmonary vasculature



Narrowing of airway takes place



Destruction of parenchyma



Inflammation





Pathophysiology

Imbalance between protease and anti-protease



Pulmonary vascular changes (thickening, collagen deposit, destruction of capillary)



Mucus hyper secretion (cilia dysfunction, airflow obstruction)



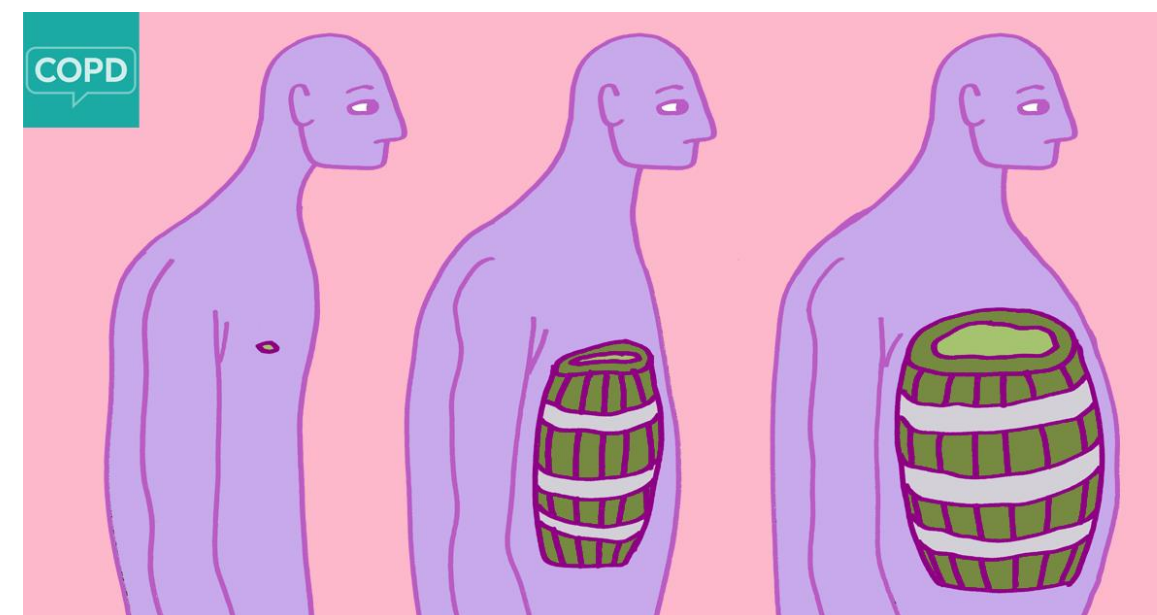
Chronic cough and sputum production



Clinical Features



- Chronic cough
- Sputum production
- Wheezing
- Chest tightness
- Dyspnoea on exertion
- Weight loss
- Respiratory insufficiency
- Respiratory Infections
- Barrel Chest – Chronic Hyperinflation leads to loss of lung elasticity

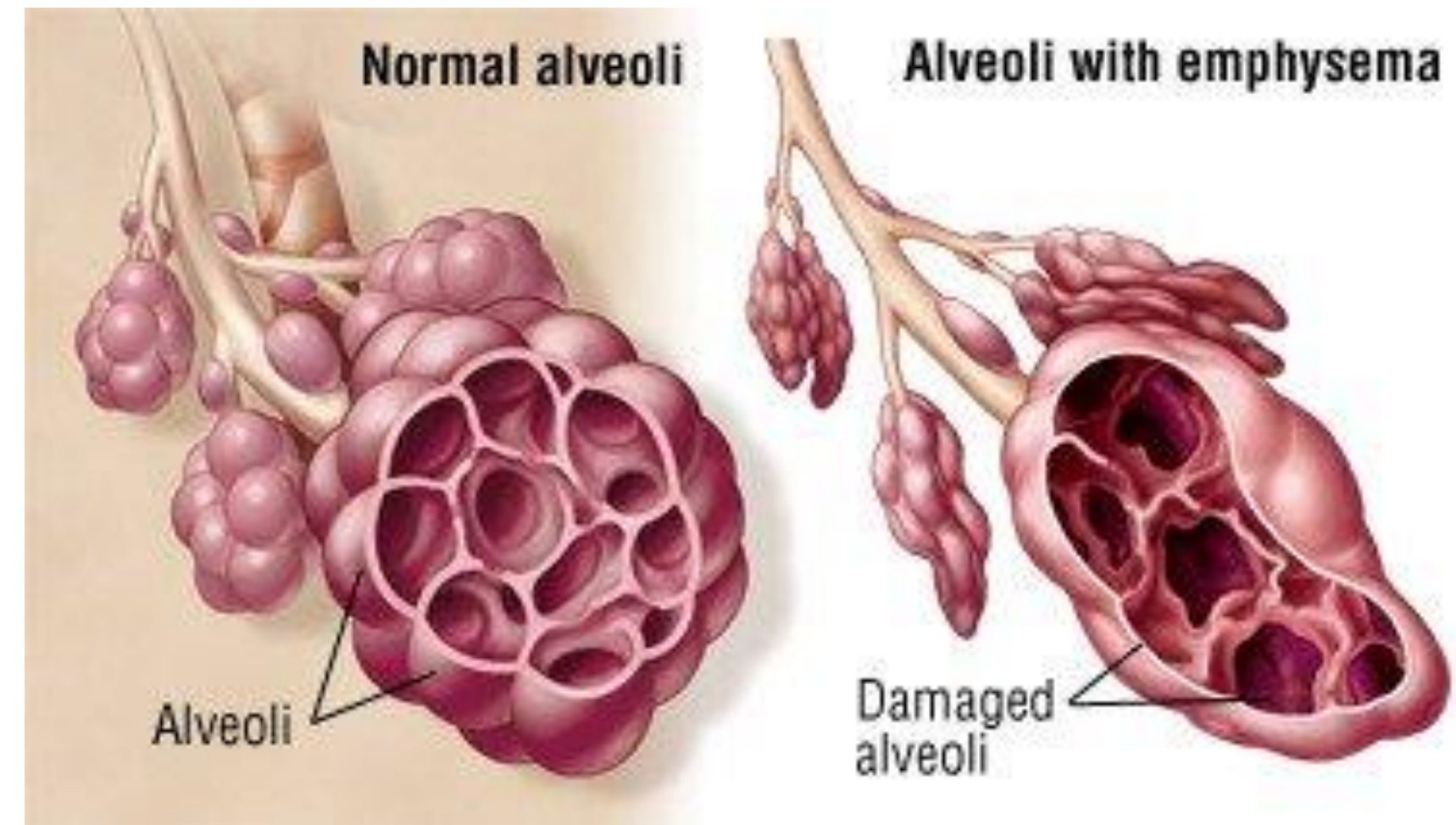




Emphysema - Definition



Abnormal permanent enlargement of the airspaces distal to the terminal bronchiole accompanied by destruction of their walls and without obvious fibrosis





Pathology of Emphysema

As the alveoli are destroyed the alveolar surface area in contact with the capillaries decreases.



Causing dead spaces (no gas exchange takes place)



Leads to hypoxia.



In later stages

CO₂ elimination is disturbed and increase in CO₂ tension in arterial blood



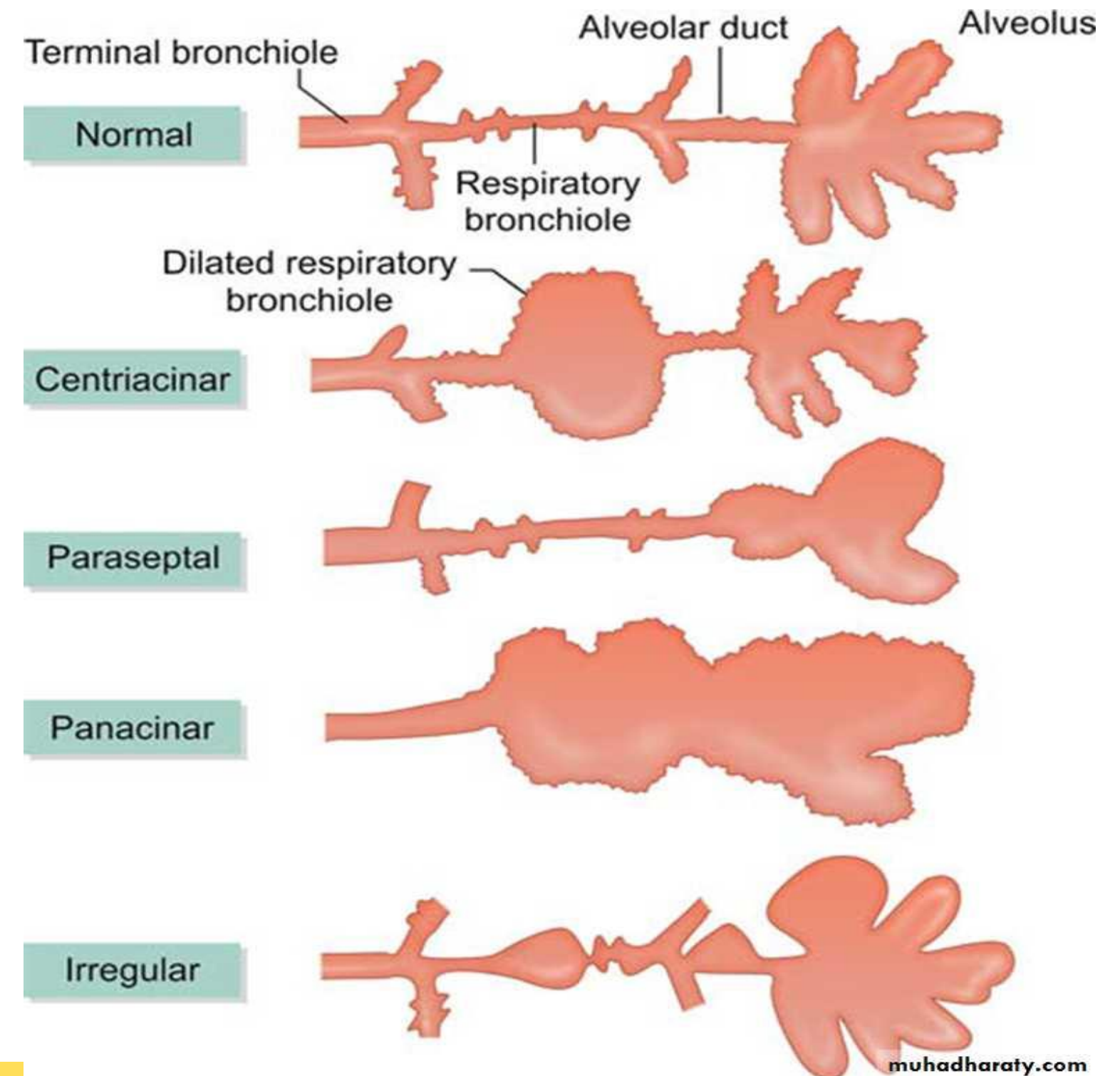
Respiratory acidosis

Classification of Emphysema

HEALTHY ALVEOLI
normal alveoli



ALVEOLI WITH EMPHYSEMA
damaged alveoli





Classification of Emphysema



- **Centrilobular** – the respiratory bronchiole (proximal and central parts of the acinus) is expanded. The distal acinus or alveoli are unchanged. Occurs more commonly in upper lobes.
- **Panlobular** – the entire respiratory acinus from respiratory bronchiole to alveoli is expanded. Occurs more commonly in the lower lobes, especially basal segments and anterior margin of the lungs
- **Paraseptal (Distal Acinar)** – localized along pleura, peripheral part of acinus. Occurrence is less common
- **Irregular or Mixed** – It's a combination of centriacinar and paraseptal, and less common



Assessment



- What is Emphysema?
- What are the types of Emphysema?
- What are the clinical features of Emphysema?



Bronchitis



Definition:

Bronchitis is a condition in which the bronchial tubes become inflamed.

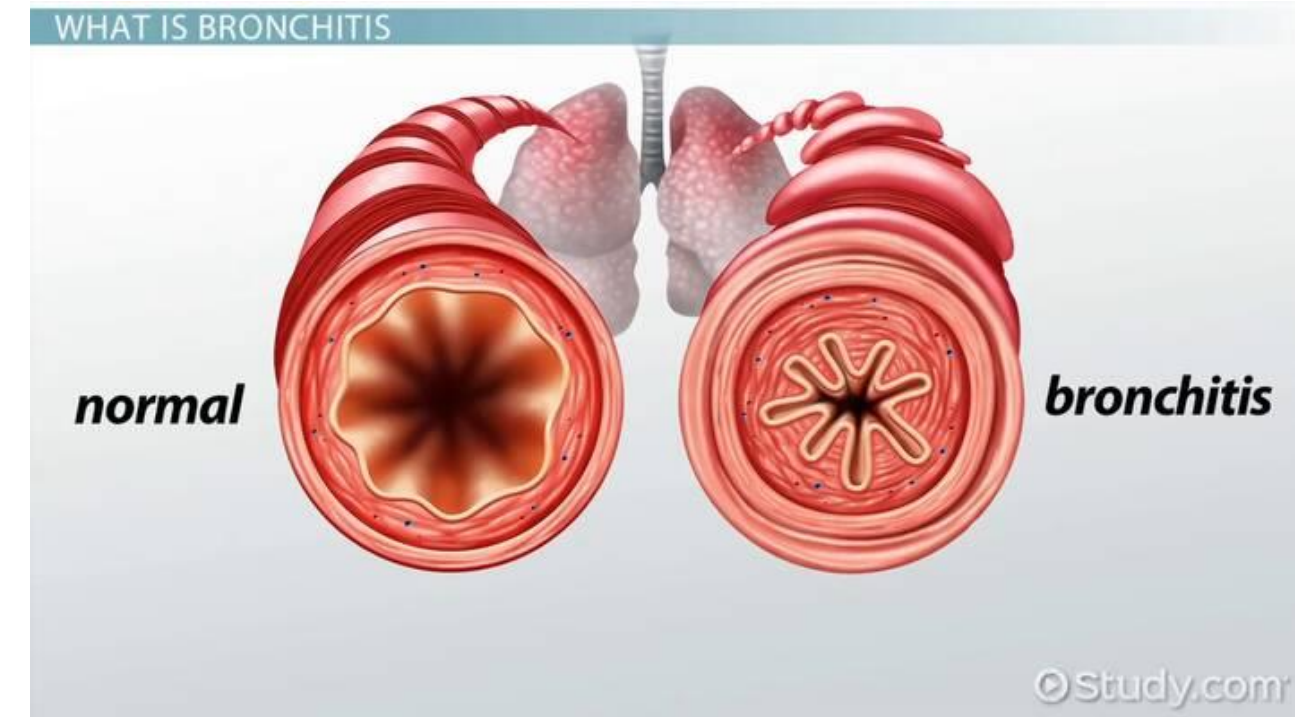
Types:

Acute

- Infections or lung irritants causes acute bronchitis

Chronic

- Chronic bronchitis is an ongoing, serious condition, causes long term effects

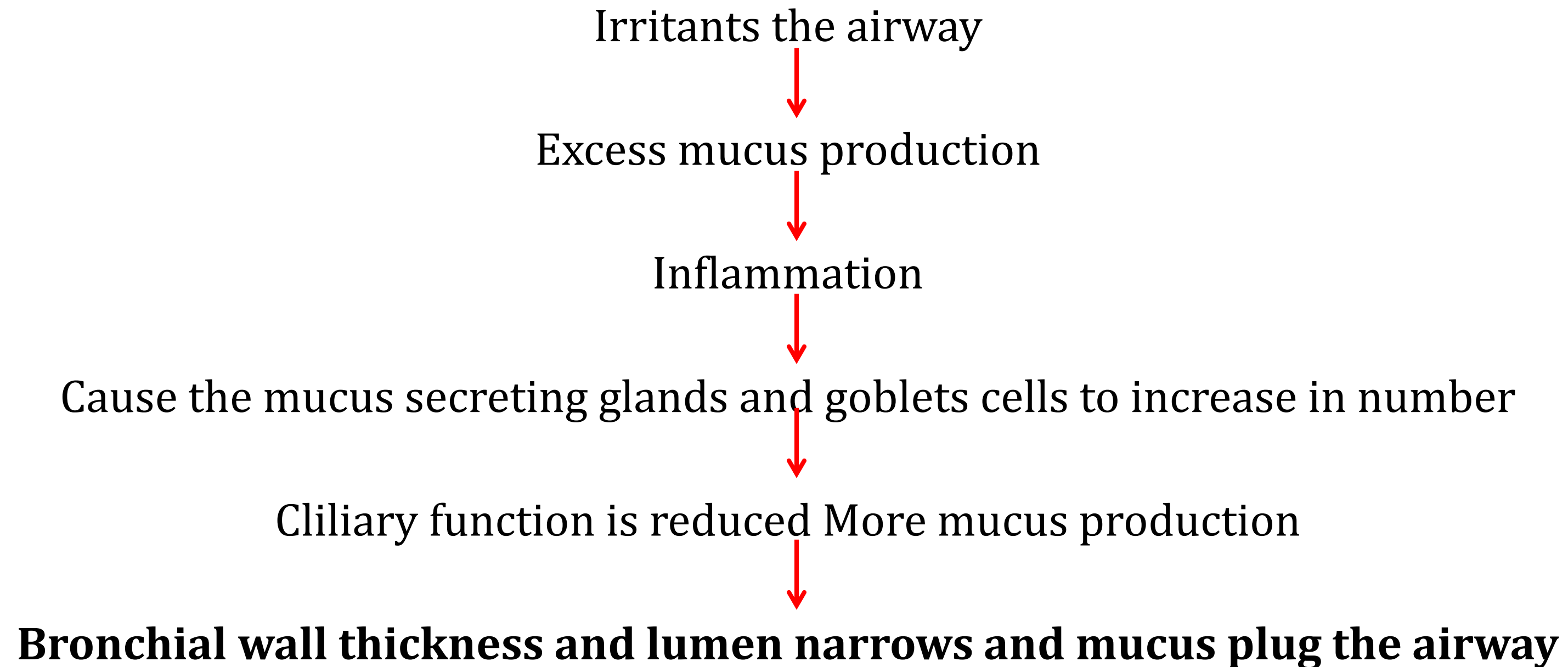




Chronic Bronchitis

It is defined as a presence of cough and sputum production for **at-least 3 months**

Pathology:



Signs and Symptoms

- Sore throat
- Fatigue
- Fever, Body aches
- Stuffy or Runny Nose
- Vomiting and Diarrhoea
- Persistent cough
- Shortness of breath



In Chronic form of Bronchitis – **Wheezing, Chest Discomfort, Large mucus formation**



Diagnosis



- Medical History
- Patient History
- Mucus – to see whether you have a bacterial infection
- Chest X Ray
- Lung Function Tests
- CBC
- ABG Analysis
- Screening of alpha antitrypsin deficiency





Management



Medical Management:

Improve Ventilation

- Bronchodilators (Albuterol)
- Methylxanthines (Theophylline and Aminophylline)
- Corticosteroids
- Oxygen therapy





Management



Surgical Management:

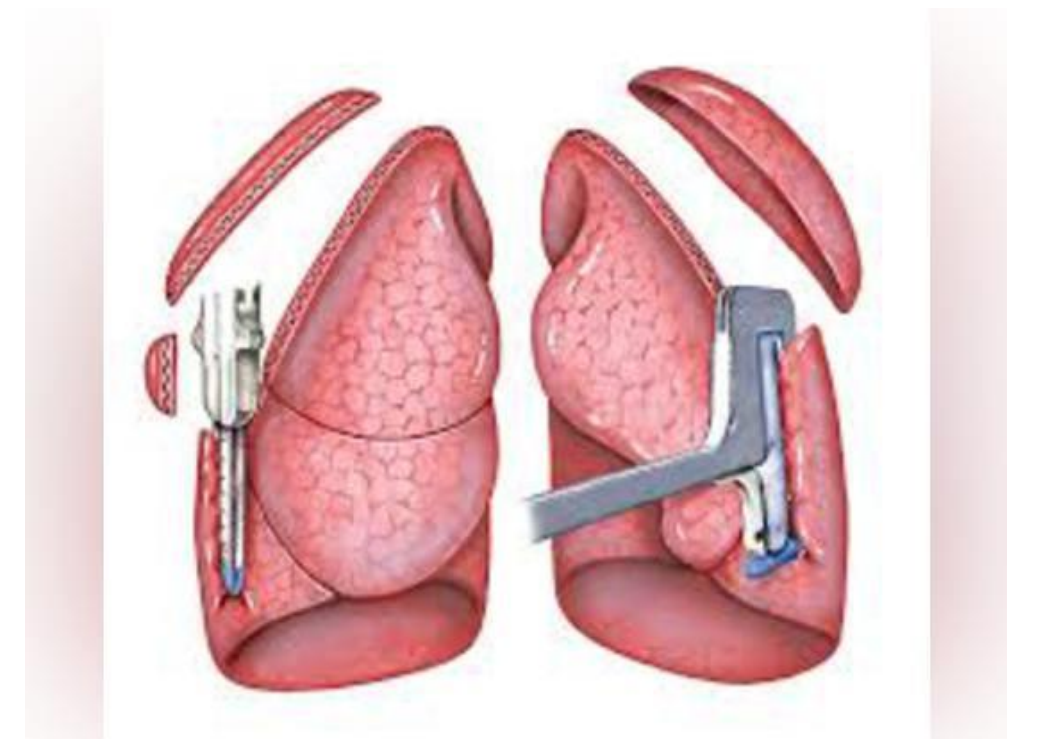
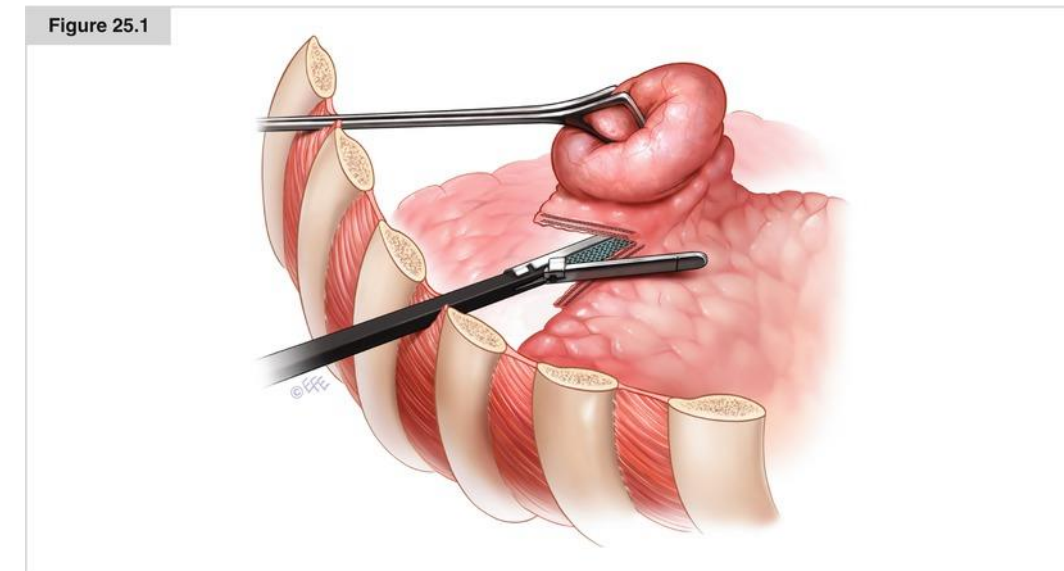
Bullectomy

Bullae are enlarged air spaces that do not contribute to ventilation but occupy space in the thorax, these areas may be surgically excised.

Lung Volume reduction surgery

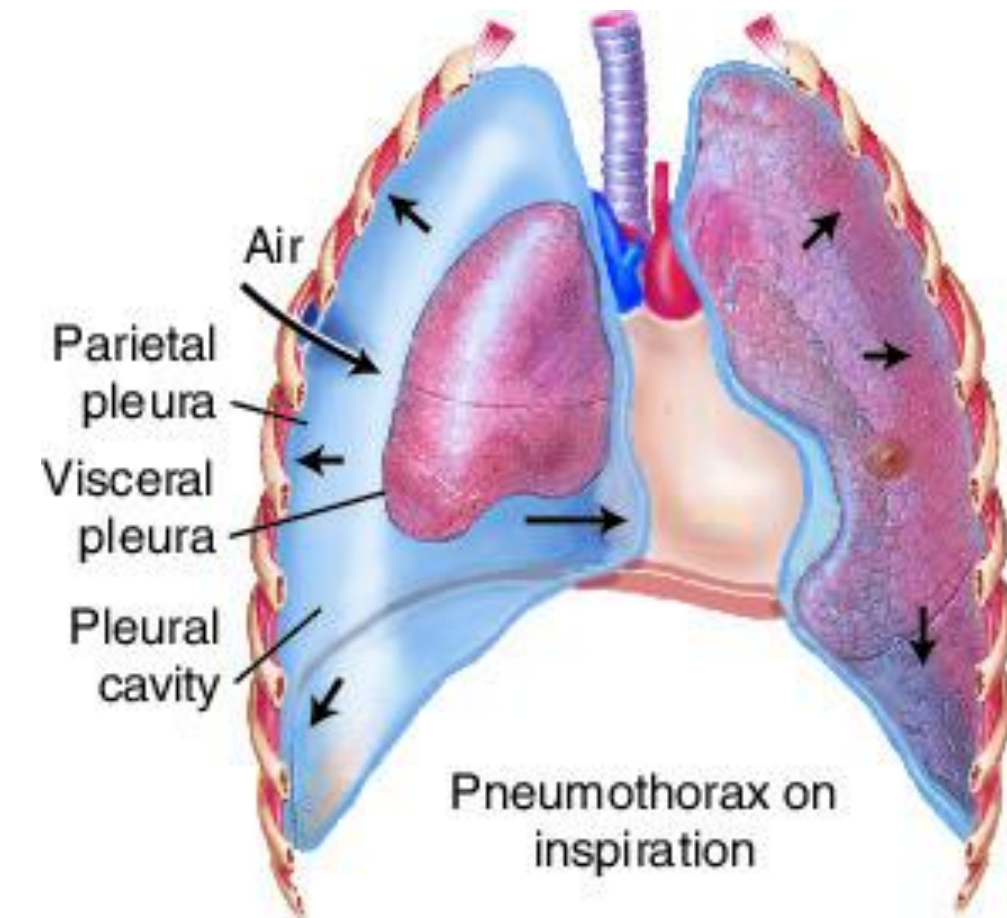
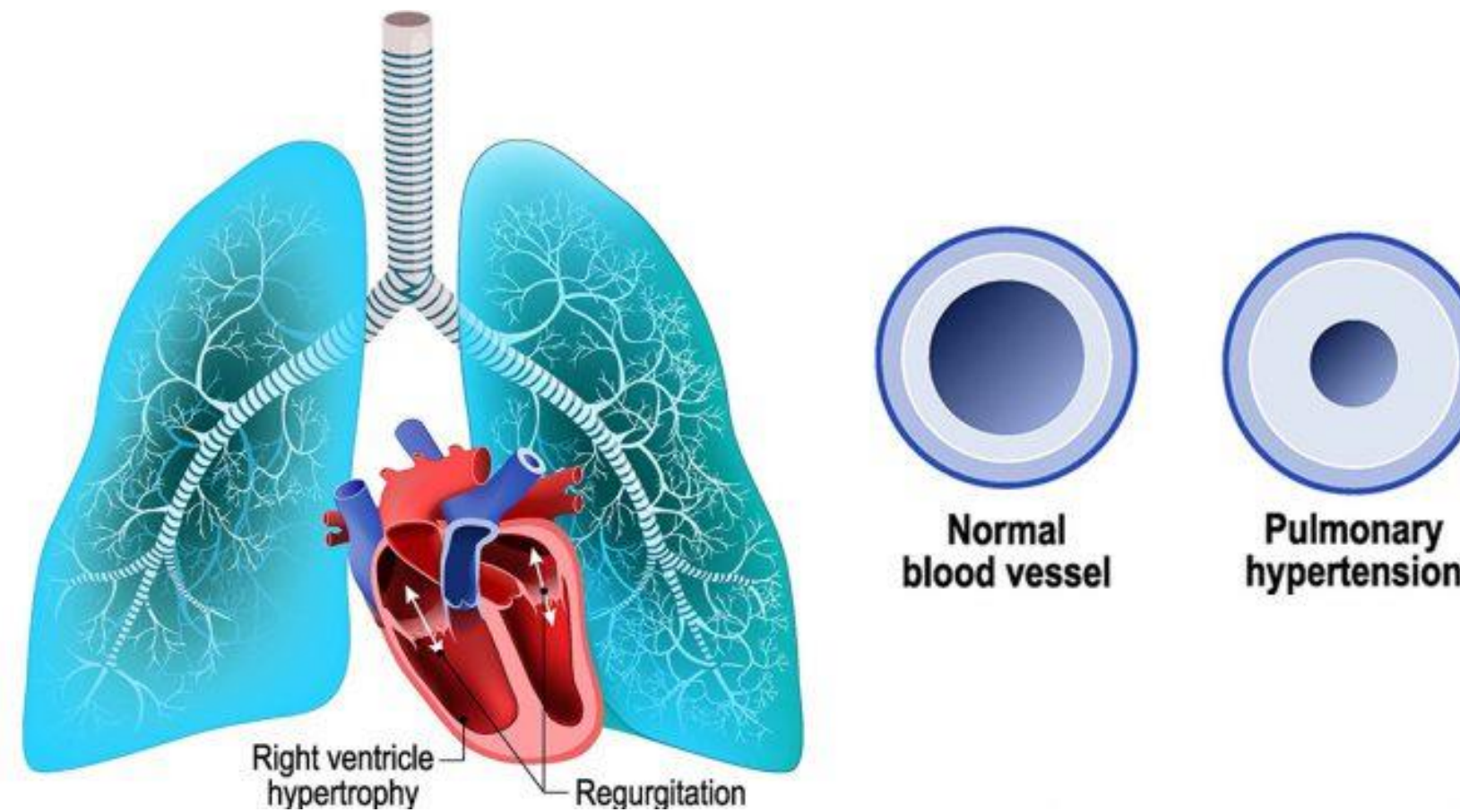
It involves removal of a portion of the diseased lung parenchyma, this allows the functional tissue to expand.

Lung Transplantation



Complications

- Respiratory Failure
- Respiratory Insufficiency
- Pneumonia
- Pneumothorax
- Pulmonary Artery Hypertension





Self Management of COPD



- Take your medications regularly
- Exercise regularly
- Stay away from infections by maintaining good hygiene
- Quit Smoking
- Eat a regular balanced diet
- Drink plenty of water at-least 1.5L/ Day



Assessment



- What is Bronchitis?
- How to diagnose COPD?
- What medical management should be given for COPD?



Thank you



References:

Text book of Pathology – Harsh Mohan

Concise text book of Pathology – Ganga S Pilli