

Basic Histopathological Diagnosis (MLS-HIST-421)

Introduction to Respiratory system

Histopathology and cytology department

Pathology department

Lec 17 and 18

Imtithal Elsayed Ibrahim

objectives

By the end of this lesson the learner is expected to:

Define the respiratory system.

Identify the important structures & histology of the respiratory system.

Classify respiratory system diseases.

Identify the types of the respiratory system specimen delivered to histopathology lab.

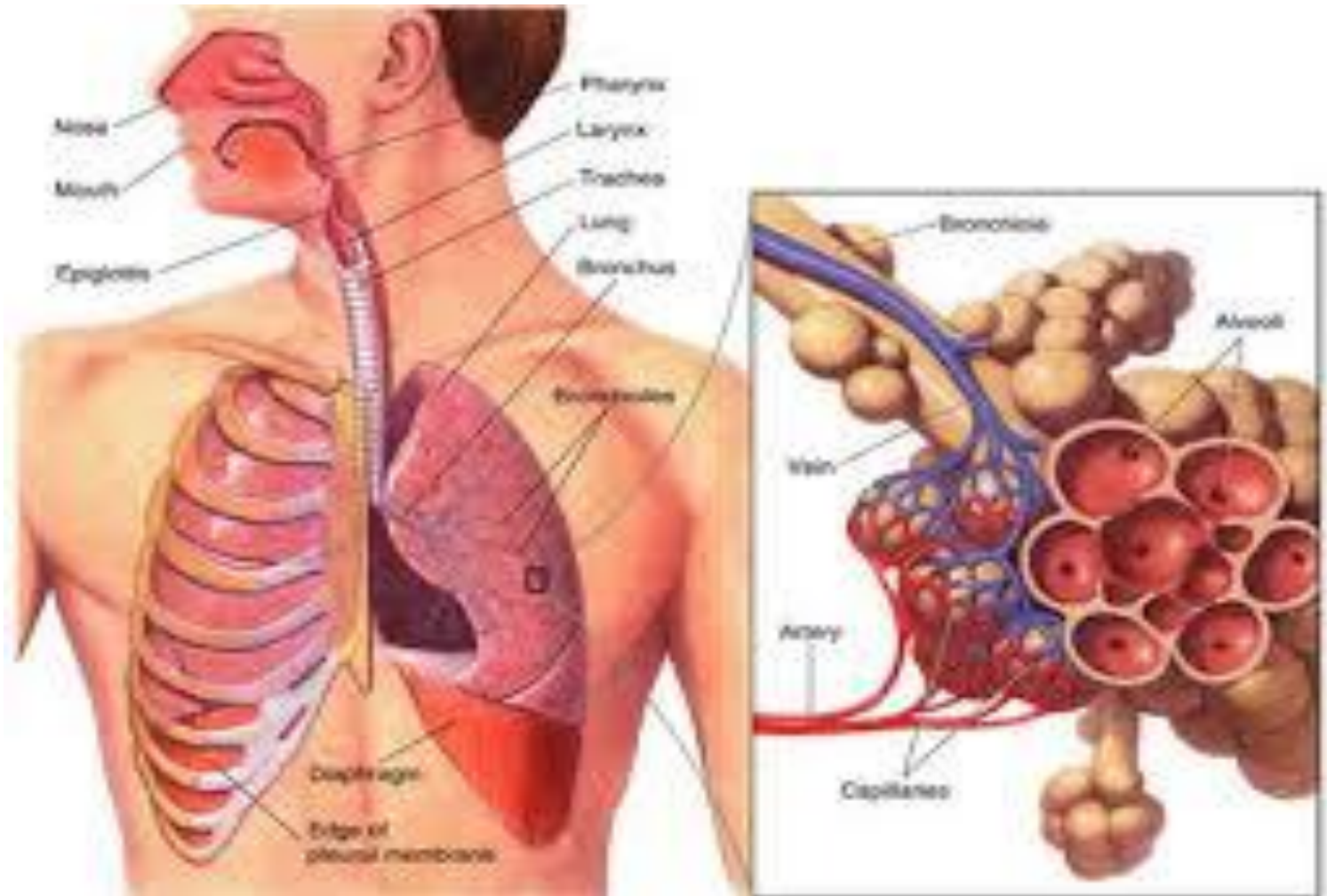
Introduction

Respiratory system is a biological system consisting of specific organs and structures used for the process of respiration.

Play vital role in human body which is responsible for gas exchange and oxygen supply.

Respiratory system is **opened** to external environment , this making it a route of organism entry & respiratory tract infections.

Overview of Respiratory system Anatomy



Respiratory Tract

Upper respiratory tract:

Nose & nasal passage .
paranasal sinuses.
pharynx.

Lower respiratory tract:

Trachea.

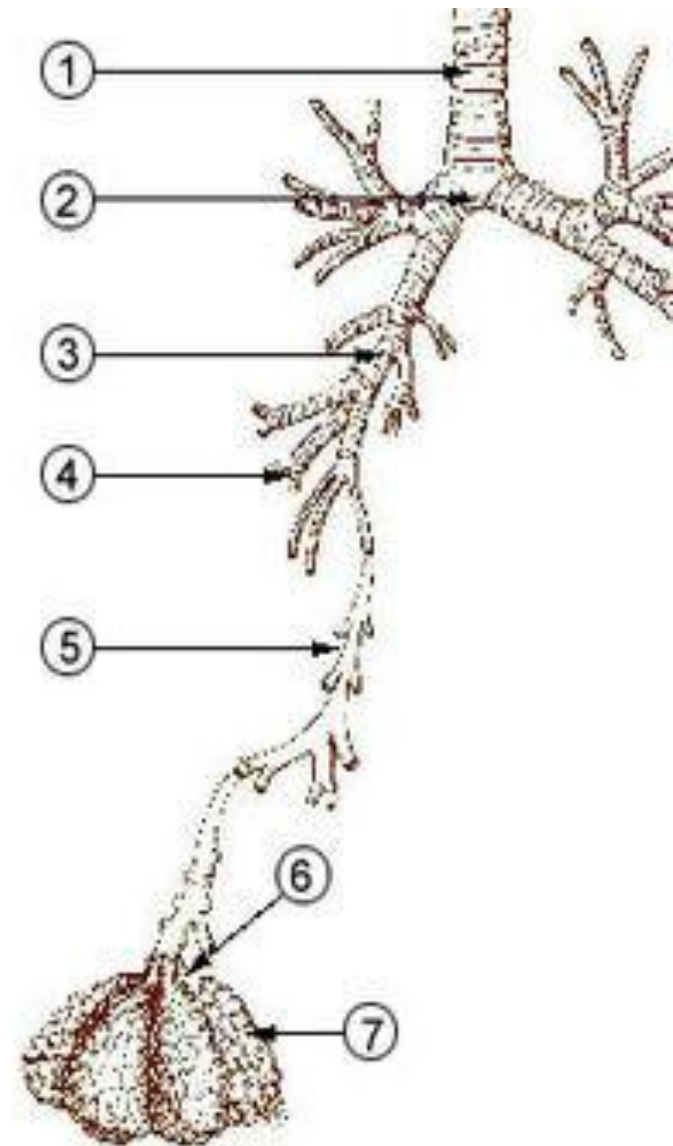
Bronchi.

Bronchioles.

Alveolar duct, alveolar sac, alveoli.

Respiratory tree

- 1-Trahea.
- 2-Main bronchus.
- 3- lobar
- 4- segmental
- 5- bronchiole
- 6- alveolar duct
- 7-alveolus



lungs

Right lung is larger had 3 lobes. The left lung had 2 lobes.

The lungs are covered with visceral pleura. Parietal pleura line the inner surface of the chest wall.

Pleural cavity is space between parietal & visceral pleurae, contain pleural fluid.

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Respiratory system histology

Trachea:

Cartilage rings.

Lined with pseudostratified ciliated columnar epithelium with goblet cells. glands may be present

Bronchi:

Plates of cartilage, smooth muscle, lined with pseudostratified ciliated epithelium with goblet cells, glands may be present

Bronchioles:

No cartilage, smooth muscle, no glands

Larger: pseudostratified ciliated epithelium with goblet cells

Smaller: simple columnar or cuboidal, ciliated epithelium

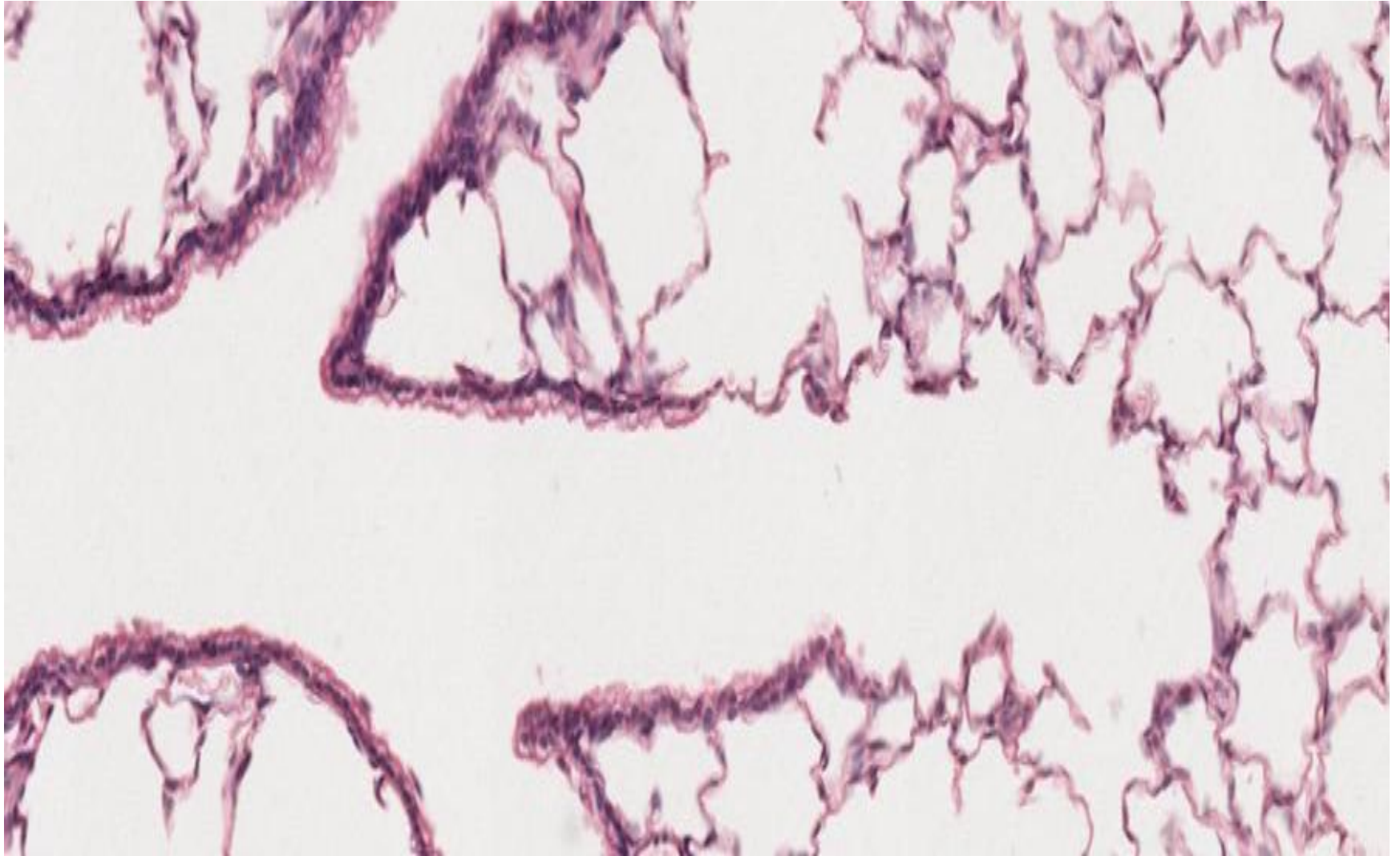
Terminal: Simple cuboidal ciliated epithelium with nonciliated cells

Cont.

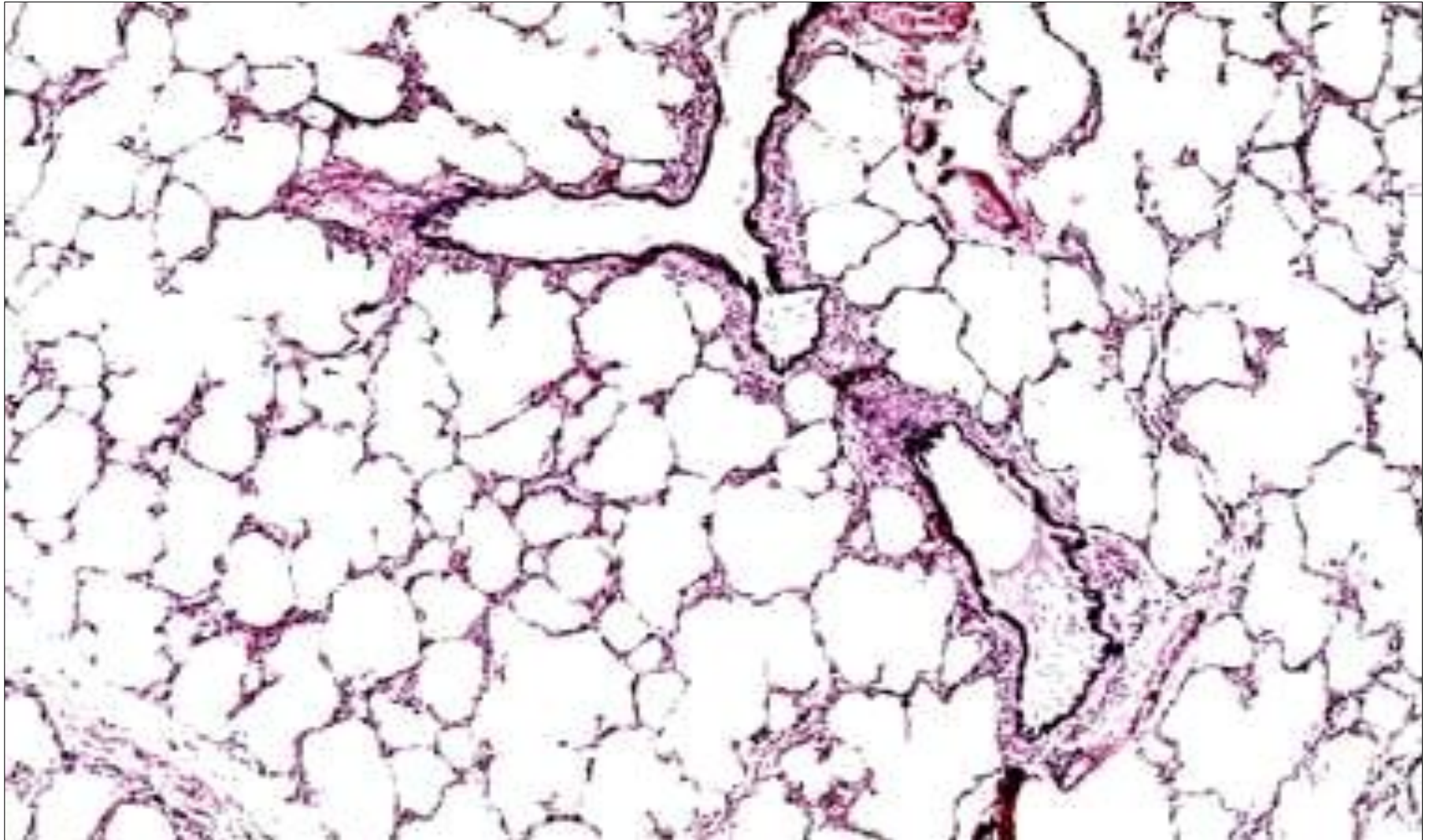
Alveolar ducts and alveoli:

Squamous epithelium (type I pneumocytes),
surfactant cells(type II pneumocytes),
macrophage

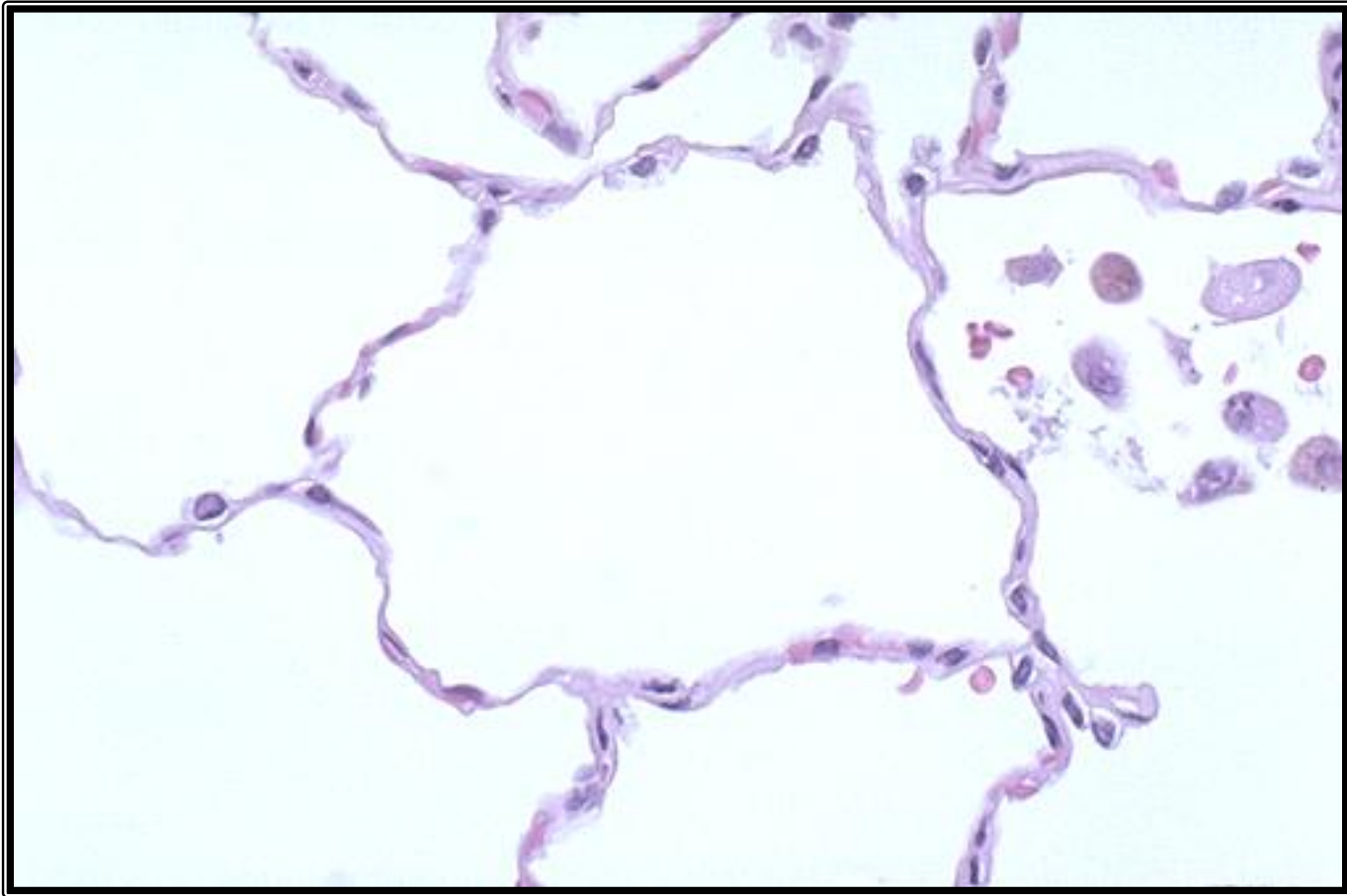
Bronchiole branching into terminal bronchiole
transitioning to respiratory bronchiole with alveoli



Normal Lung



Normal Lung high power



Classification of respiratory system diseases

Congenital.

Vascular diseases.

Inflammatory.

Chronic obstructive pulmonary diseases (COPD).

Restrictive lung diseases.

Lung cancer.

Pleural diseases.

Inflammatory diseases

Infections:

Viral.

Bacterial.

Fungal.

Parasitic.

Acute or chronic infections.

Auto immune diseases.

Vascular diseases

Pulmonary Embolism.

Hemorrhage.

Infarction

Pulmonary Hypertension

COPD

Chronic obstructive pulmonary disease (COPD) is progressive airflow limitation that is not usually reversible.

COPD Types

Chronic bronchitis.

Asthma

Pulmonary emphysema.

Bronchoiectesis.

Restrictive pulmonary diseases

Lung fibrosis.

Pneumoconiosis .

Interstitial lung diseases

Pleural diseases

Pleural effusion: fluid in the pleural cavity.

Empyema: pus in pleural cavity.

Pneumothorax: air in pleural cavity.

Pleurisy.

Pleural tumour (mesothelioma)

Examination of the lung specimens

You need to identify the type of lung biopsy.
orient the specimen and determine the
anatomic location of the lesion.

The weight of the whole specimen should be
recorded.

Description of gross abnormalities, their
size, color and location.

Types of the lung Biopsy

Pneumonectomy: Removal of an entire lung

Lobectomy: Removal of one lobe of the lung.

Sleeve Lobectomy: Removal of a cancerous lobe of the lung along with part of the bronchus that attaches to it

Wedge Resection: Removal of a small, wedge-shaped portion of the lung.

Segmentectomy: Removes a larger portion of the lung lobe than a wedge resection, but not the whole lobe.

Bronchoscopy biopsy: small.