

wj/2 w2 (121) MONDAY 27 FEB. 1<sup>st</sup> 4R

## The Practical Lesson of Lung & Pleura

### Objectives : Demonstration & Study :

#### Pleura :

Pleura & Pleural space (definition, Divisions & function).

#### Lung :

1-Apex of Lung : directed upward, relation.

2-Base of Lung : directed downward ; relation.

3-Costal surface : related to thoracic wall & costal pleura,

presents the fissures of Lungs : (oblique fissure in both lungs & horizontal (transverse) fissure in right lung only).

Accordingly, right lung has 3 lobes & left lung has 2 lobes.

#### 4-Medial Surface : divided into :

- a) Larger anterior mediastinal surface : related to mediastinum (Relations of right & left lungs) & contains the hilum of the lung & pulmonary ligament.

DR. SANA

- b) **Smaller posterior vertebral surface** : related to sides of vertebral bodies, intervertebral discs & sympathetic trunk.

### 5-Borders :

**Anterior** : thin & sharp, presents the cardiac notch & the lingula in left lung, separates the costal surface from mediastinal part of medial surface.

**Posterior** : Thick & rounded, separates the costal surface from vertebral part of medial surface.

**Inferior** : separates the costal & medial surfaces from base of lung.

**6-Hilum of Lung** : It is a part of mediastinal surface of lung that gives passage to the structures forming **the Root of lung** :

**A)Bronchus** : the left divides after entering the lung (one opening) , the right divides before entering (2 opening).

**B) Pulmonary artery.**

**C) Pulmonary veins.**

**D)Bronchial vessels** : supply bronchi & lungs :

-**On the right side** : 1 artery + 2 veins.

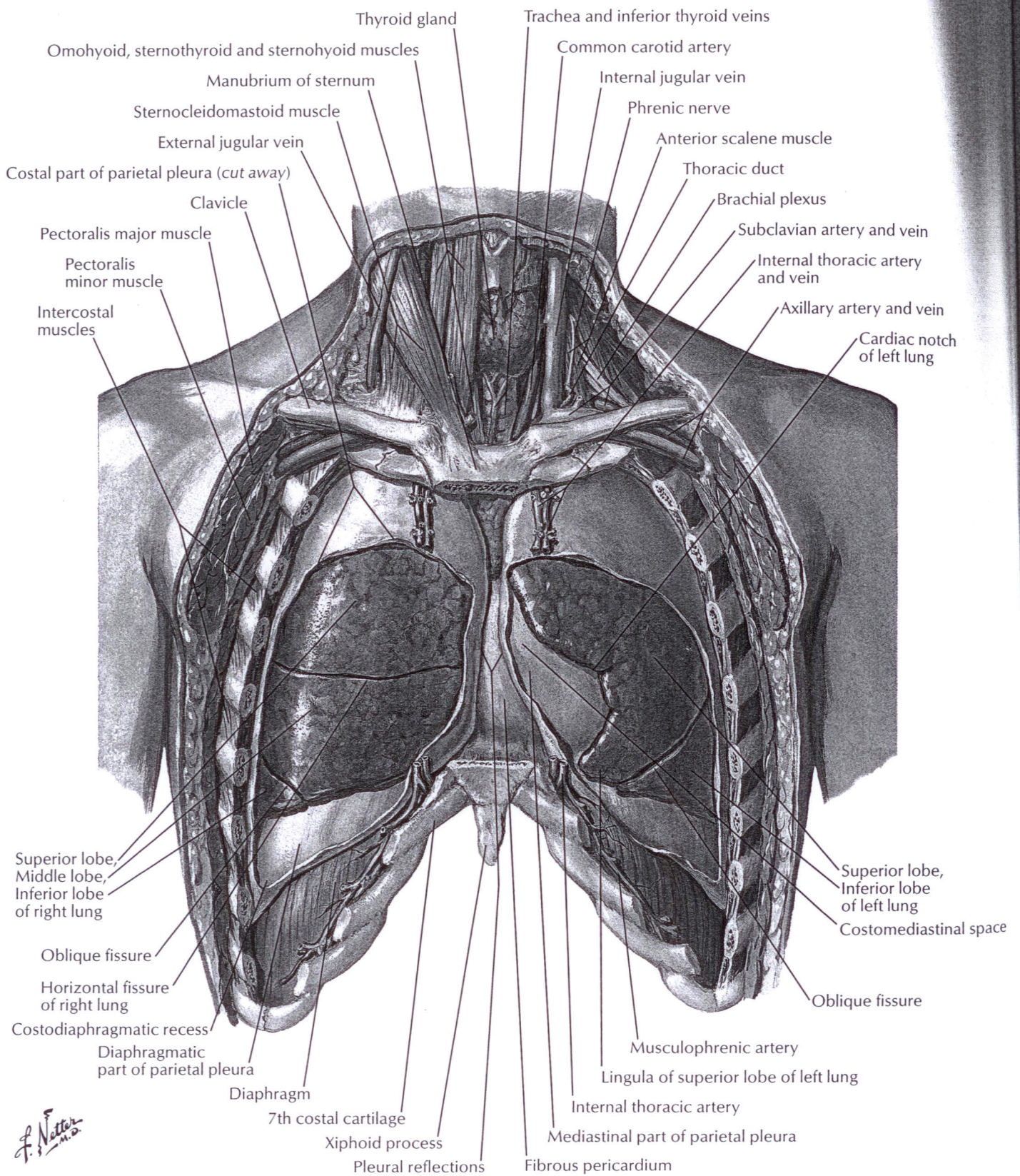
-**On the left side** : 2 arteries + 2 veins.

**E) Anterior & posterior pulmonary plexuses** of autonomic fibres.

**F) Bronchopulmonary lymph nodes.**

### 7-Mention the differences between right & left lungs.

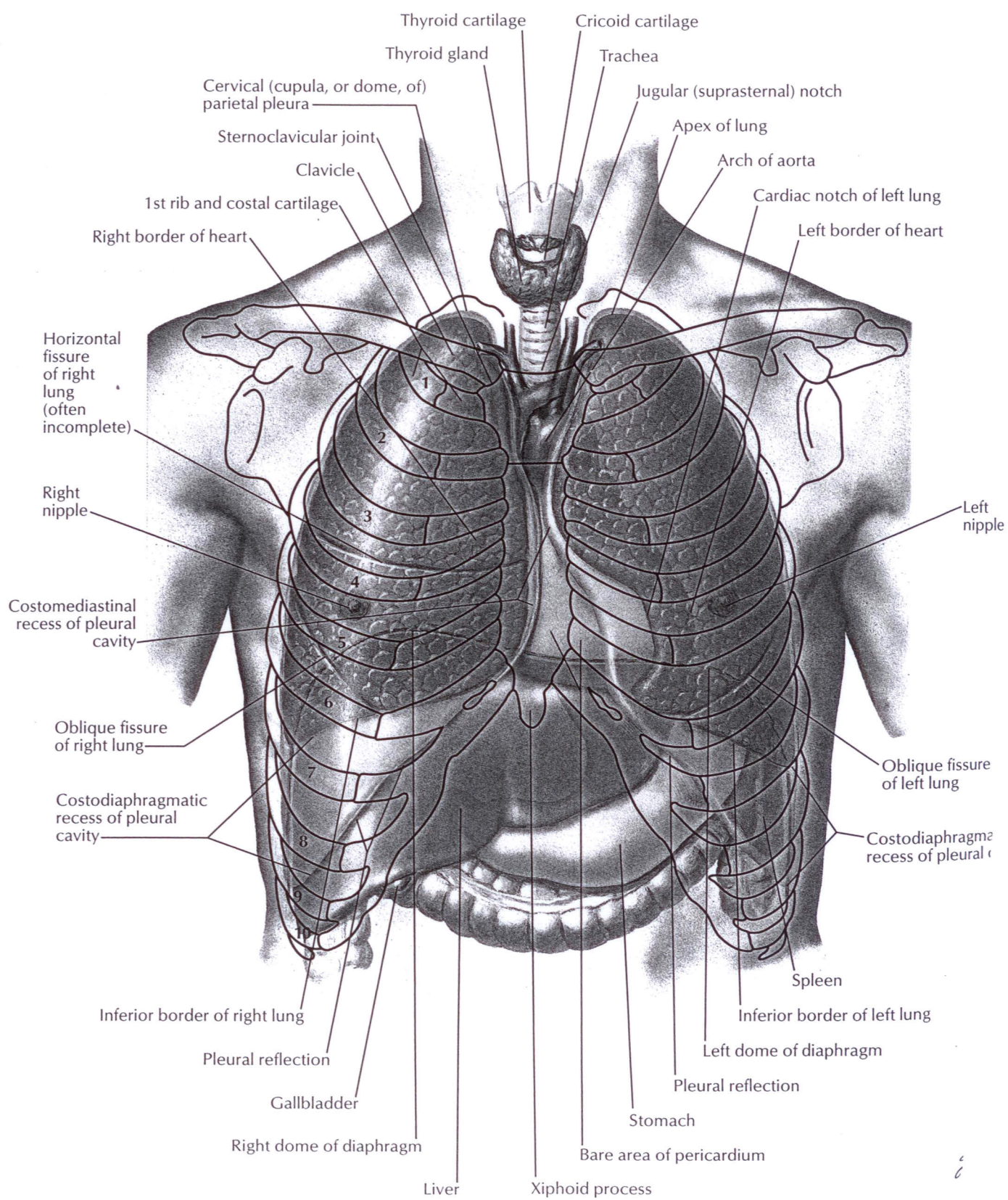






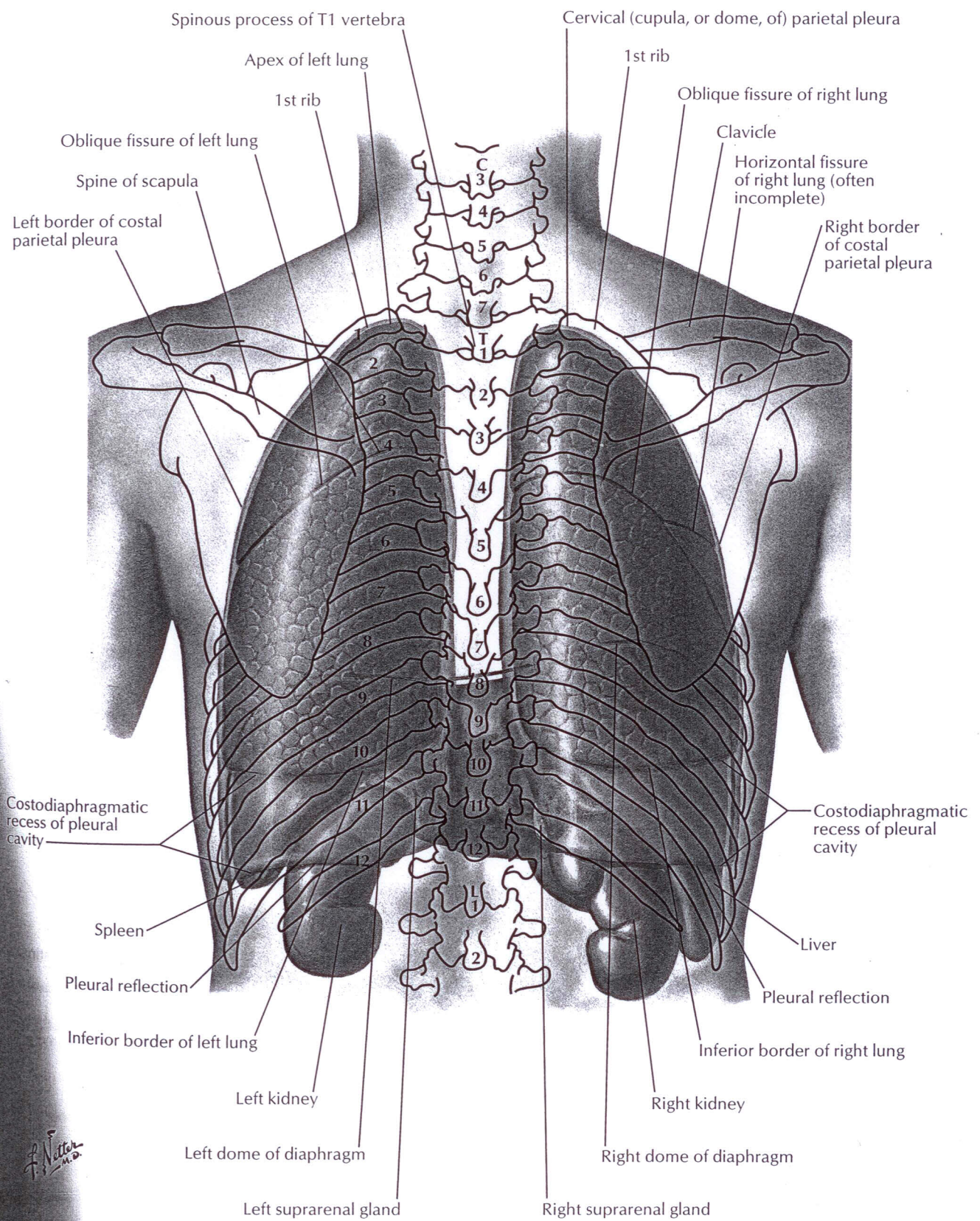
# 3

## Topography of Lungs: Anterior View





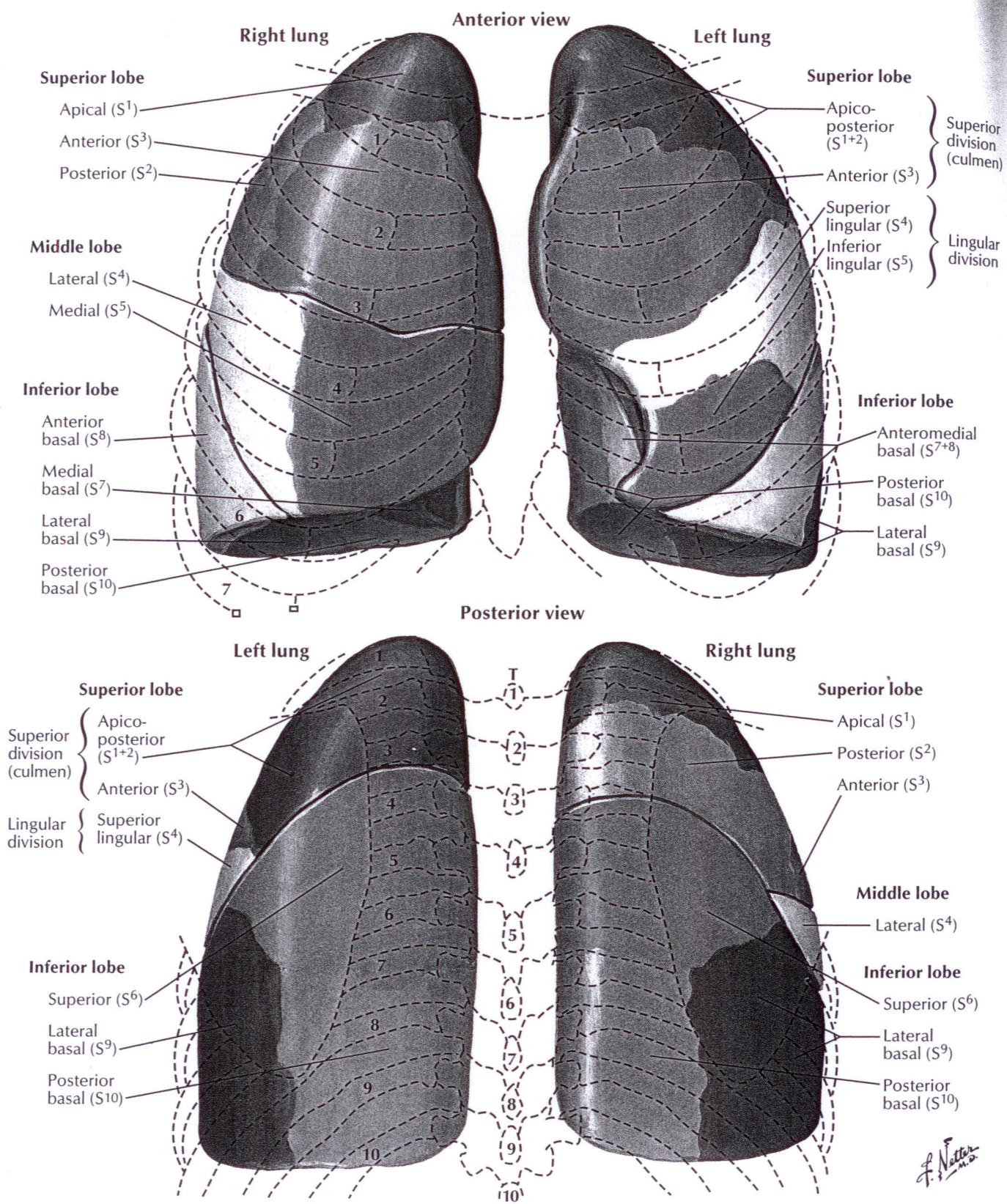
# Topography of Lungs: Posterior View



Lungs

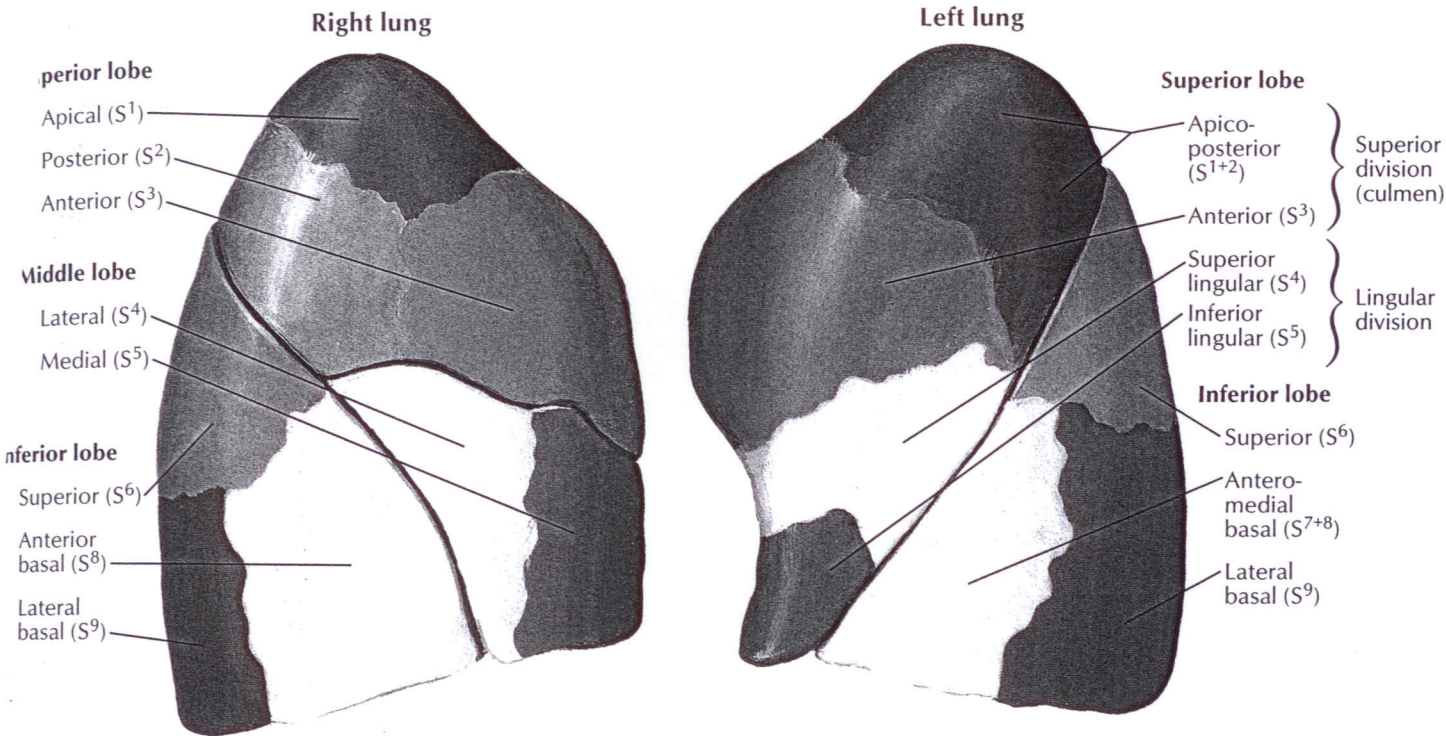


# 3 Bronchopulmonary Segments

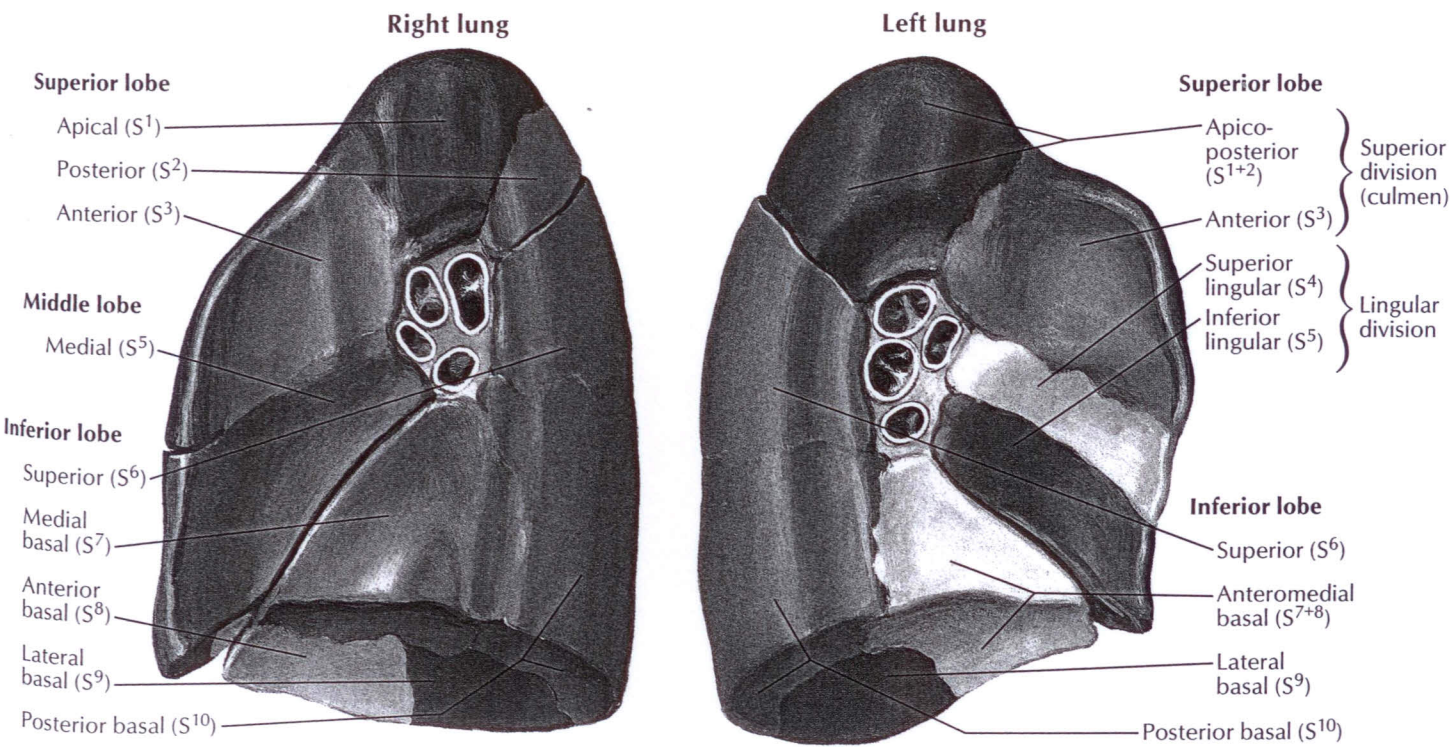




Lateral views

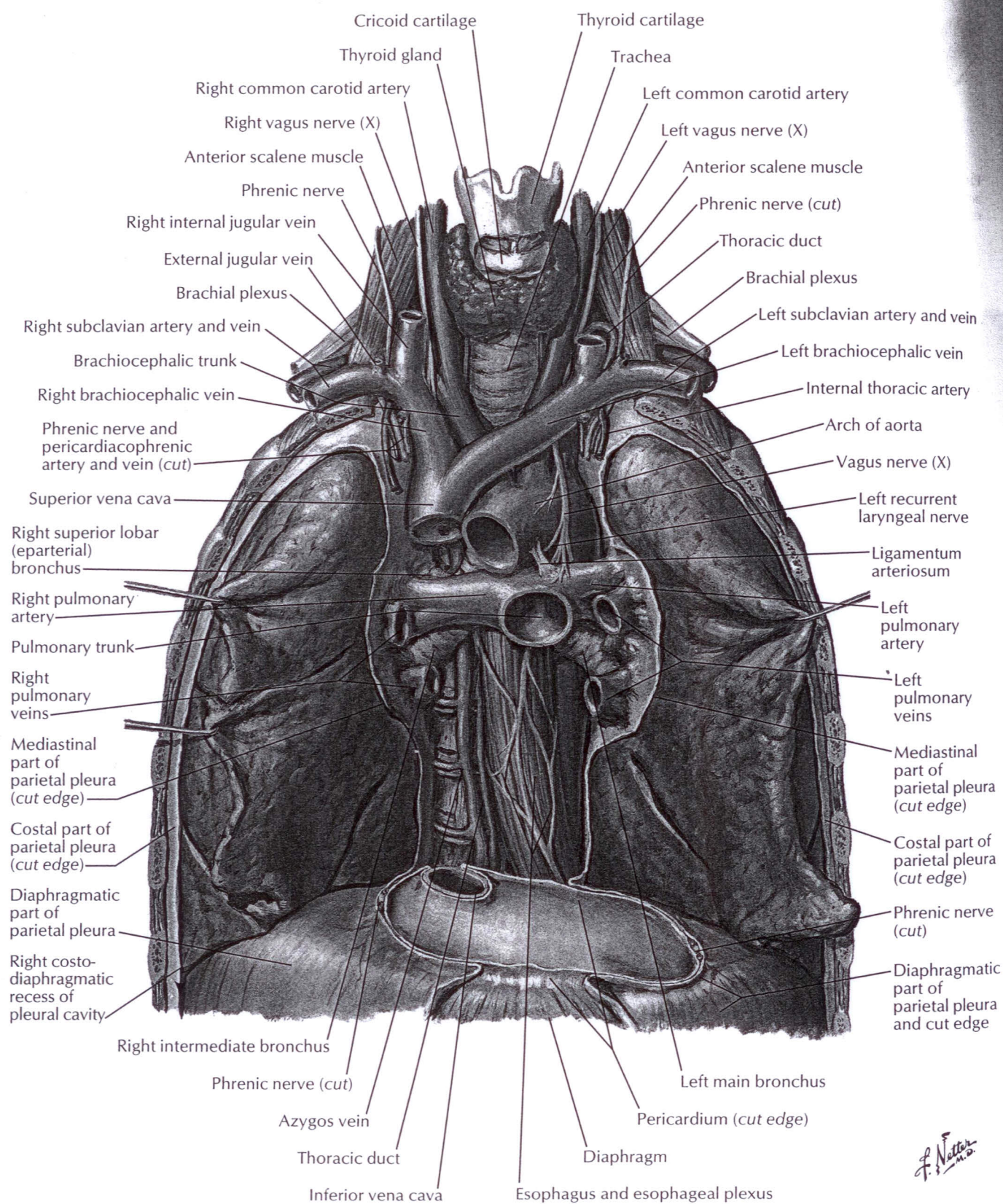


Medial views





# Great Vessels of Superior Mediastinum





- **Right side:** Azygos vein, right vagus nerve, and pleura.
- **Left side:** Arch of the aorta, left common carotid, left subclavian arteries, left vagus nerve, left phrenic nerve, and pleura.

## BRONCHI

### Right Principal

The **right principal (main) bronchus** is wider, shorter, and more vertical than the left principal bronchus. Before entering the hilum of the right lung, it gives off the **superior lobar bronchus**. On entering the hilum, it divides into a **middle** and an **inferior lobar bronchus**.

### Left Principal

The **left principal (main) bronchus** is narrower, longer, and more horizontal than the right principal bronchus. It passes to the left below the arch of the aorta and in front of the esophagus. On entering the hilum of the left lung, it divides into a **superior** and an **inferior lobar bronchus**.



## CLINICAL NOTES

### INHALED FOREIGN BODIES

Because the right bronchus is wider and more direct continuation of the trachea, foreign bodies tend to enter the right instead of the left bronchus. From there they usually pass into the middle or lower lobe bronchi.

## Pleurae

The pleurae are two serous sacs surrounding and covering the lungs (Fig. 1-8). Each pleura has two parts: a **parietal pleura**, which lines the thoracic wall and covers the thoracic surface of the diaphragm and the lateral surface of the mediastinum; and a **visceral pleura**, which covers the outer surfaces of the lungs and extends into the interlobar fissures. The parietal pleura becomes continuous with the visceral pleura at the **hilum** of each lung. Here, they form a cuff that surrounds the structures entering and leaving the lung at the **lung root**. The **pulmonary ligament** is a loose extension of this cuff below the lung root that allows movement during respiration.

The **pleural cavity (pleural space)** is a slitlike space that separates the parietal and the visceral pleurae. It normally contains a small amount of **pleural fluid** that lubricates the apposing pleural surfaces. The **costodiaphragmatic recess** is the lowest area of the pleural cavity into which the lungs expand during deep inspiration.



## CLINICAL NOTES

### PNEUMOTHORAX

As the result of disease or injury, air can enter the pleural cavity from the lungs or through the chest wall; this condition is known as pneumothorax.

## NERVE SUPPLY OF THE PLEURA

### Parietal Pleura

The parietal pleura is sensitive to pain, temperature, touch, and pressure. The costal pleura is supplied by the intercostal nerves, the mediastinal pleura by the phrenic nerve, and the diaphragmatic pleura over the domes by the phrenic nerve and around the periphery by the lower intercostal nerves.

### Visceral Pleura

The visceral pleura receives an autonomic nerve supply from the pulmonary plexus. It is sensitive only to stretching.

## ENDOTHORACIC FASCIA

The endothoracic fascia is a thin layer of loose connective tissue that separates the parietal pleura from the thoracic wall.

## Lungs

The lungs (right and left) are situated on each side of the mediastinum (Fig. 1-8). Between them, in the mediastinum, lie the heart and great vessels. The lungs are conical in shape and are covered with visceral pleura. The lungs are freely suspended, but they are attached by their roots to the mediastinum.

Each lung has a blunt **apex** that projects upward into the neck (Fig. 1-9) for approximately 1 in. (2.5 cm) above the clavicle, a concave **base** that sits on the diaphragm, a convex **costal surface** that corresponds to the concave chest wall, and a concave **mediastinal surface** that is molded to the pericardium and other mediastinal structures. About the middle of the mediastinal surface is the **hilum**, which is a depression where the bronchi, vessels, and nerves enter the lung to form the **root**.

The **anterior border** is thin and overlaps the heart, and here, on the left lung, is a notch called the **cardiac notch**. The **posterior border** is thick and lies beside the vertebral column.

## LOBES AND FISSURES

### Right Lung

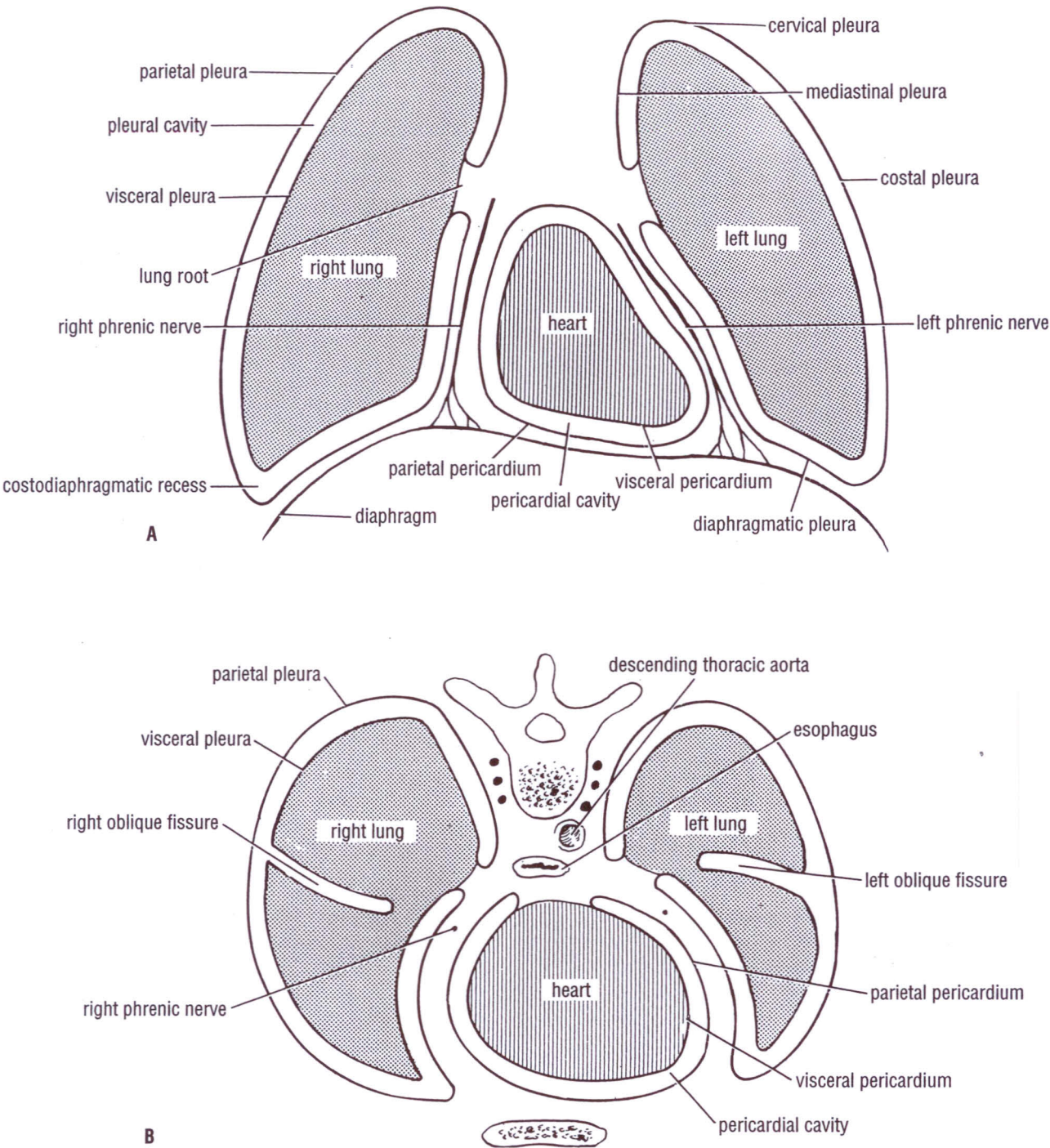
The right lung is slightly larger than the left lung, and it is divided into the **upper**, **middle**, and **lower lobes** by the oblique and the horizontal fissures (Fig. 1-9).

The **oblique fissure** runs from the inferior border upward and backward across the medial and costal surfaces until it cuts the posterior border. The **horizontal fissure** runs horizontally across the costal surface to meet the oblique fissure. The middle lobe is thus a small, triangular lobe bounded by the horizontal and oblique fissures.

### Left Lung

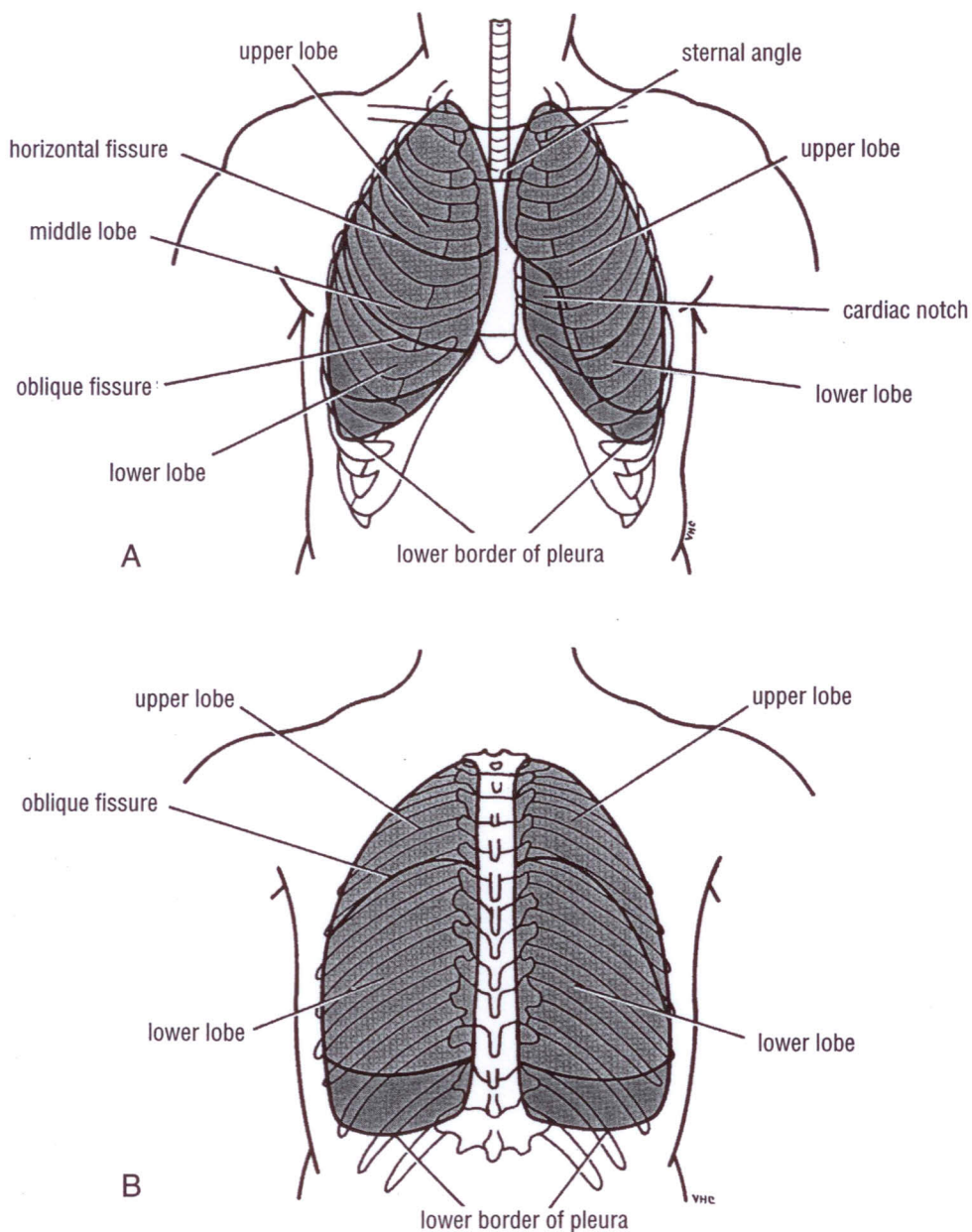
The left lung is divided by only one fissure (the oblique fissure) into two lobes, the **upper** and **lower lobes**.





**Figure 1-8** **A.** Coronal section of the thorax showing the arrangements of the visceral and parietal layers of the pleura and of the serous pericardium. **B.** Horizontal section of the thorax showing the arrangement of the pleura and the pericardium.





**Figure 1-9** A. Surface markings of the lungs and parietal pleura on the anterior thoracic wall. B. Surface markings of the lungs and parietal pleura on the posterior thoracic wall.

### BRONCHOPULMONARY SEGMENTS

Bronchopulmonary segments are the anatomic, functional, and surgical units of the lungs. Each lobar (secondary) bronchus, which passes to a lobe of the lung, gives off branches called **segmental (tertiary) bronchi** (Fig. 1-7). Each segmental bronchus then enters a bronchopulmonary segment. A **bronchopulmonary segment** has the following characteristics:

- It is a subdivision of a lung lobe.
- It is pyramidal in shape, with its apex toward the lung root.

- It is surrounded by connective tissue.
- It has a segmental bronchus, a segmental artery, lymph vessels, and autonomic nerves.
- The segmental vein lies in the connective tissue between adjacent bronchopulmonary segments.
- Because it is a structural unit, a diseased segment can be removed surgically.

### BLOOD SUPPLY OF THE LUNGS

The bronchi, connective tissue, and visceral pleura are supplied by the bronchial arteries, which are branches of the