

01

The Human Lung

- **Gross Anatomy**
- **Function**

1.1. Gross Anatomy

The lungs are in the chest (**Figure 1**), on either side of the heart. The right lung has 3 compartments or lobes (Upper, middle, and lower) and the left lung has 2 lobes (Upper and lower). Air is inhaled through the nose and throat and flows past the voice box (Larynx) into the windpipe (Trachea). The windpipe divides into 2 tubes, the left and right bronchi, which supply air to each lung. Within the lung, the tubes get smaller and smaller (Bronchioles) until they reach air sacs (Alveoli). Alveoli are not all the same size (**Ganong, 1987**).

1.2. Function

Lungs have respiratory, metabolic, endocrine, defense and excretory function (**Ganong, 1987**).

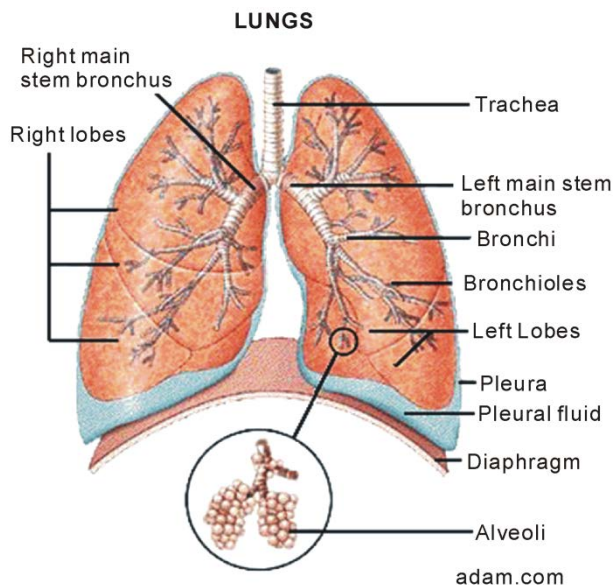


Figure 1. The human lungs (www.utmem.edu/mlrp/images/illustrated-lung.gif).

1.2.1. Respiratory Function

Respiratory system consists of a gas exchange organ (Lungs) and a pump that ventilates the lungs (Chest wall; respiratory muscles) by increasing and decreasing the thoracic cavity. Total lung capacity; is the sum of the inspiratory and expiratory reserves in addition to the tidal and residual volumes \approx 5800 ml (McGraw, 1999).

In mechanical terms, our lungs can be described as the site of external respiration: Oxygen is extracted there from the air we inhale and infused into the blood stream. With each exhalation, carbon dioxide is disposed. The lungs relieve the blood of its burden of waste and return a refreshed, oxygen-rich stream of blood to the heart through the pulmonary vein. Traces of other gases such as methane from the intestines are also found in expired air. Sometimes acetone and over 250 different volatile substances have been identified.

1.2.2. Metabolic and Endocrine Function

Lungs are involved in a number of metabolic and endocrine functions. They manufacture local substances as surfactants. They contain a fibrinolytic system that lyses clots in the pulmonary vessels. They also synthesis and release a variety of substances that enter the systemic circulation as prostaglandins, histamine and kallikreins. Others are partially removed from the blood via pulmonary artery as prostaglandins, adenine nucleotides, serotonin, norepinephrine, acetylcholine, and bradykinin.

1.2.3. Defense and Excretory Function

Lungs are internal organs. Yet they are, uniquely, constantly exposed to our external environment, a direct interface with the world outside. With each breath, a host of alien substances enter our bodies; pollens, dust, viruses, bacteria, tobacco smoke, and toxic chemicals (Ganong, 1987).