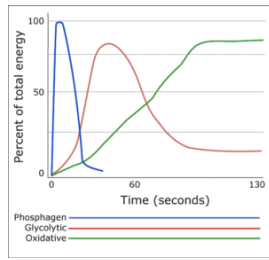
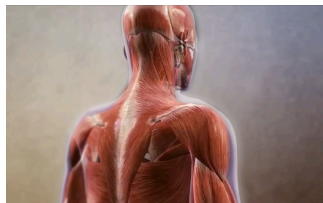


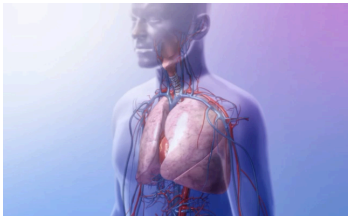
Review of the Respiratory and Circulatory System









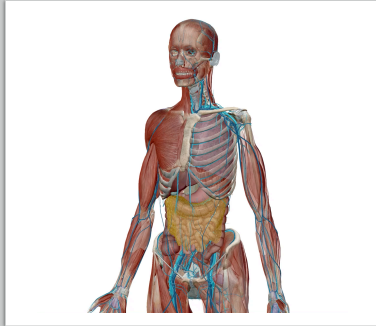


Respiratory System Overview

- The process of moving air in and out of the lungs is called pulmonary ventilation.
- Gas exchange between the lungs and the blood is called external respiration.
- Internal respiration exchange gases between the blood and the cells.

Introduction

- Oxygen is essential to every cell and tissue in the body in which it uses it to produce energy necessary to support life
- The respiratory system ensures oxygen is available for other body systems



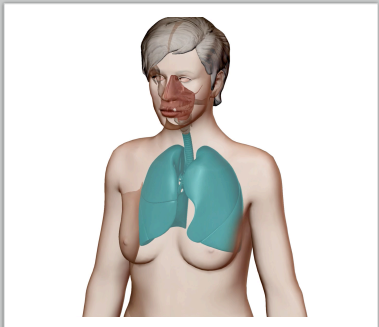
Anatomy of the Respiratory System

Upper respiratory tract

- Nose
- Mouth
- Pharynx

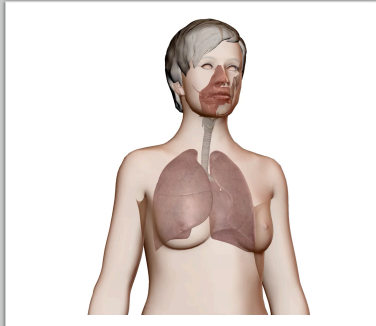
Lower respiratory tract

- Trachea
- Bronchi
- Lungs



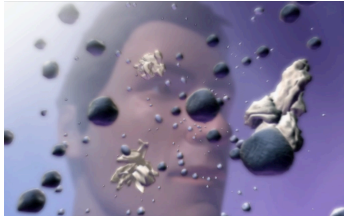
Divisions of the Respiratory System

- Nasal Cavity
- Oral cavity and pharynx
- Larynx
- Trachea
- Lungs



Upper Respiratory system

- Air that enters the nose is filtered, moistened and warmed by structures in the respiratory mucosa
- Hairs filters out large dust particles



The Pharynx

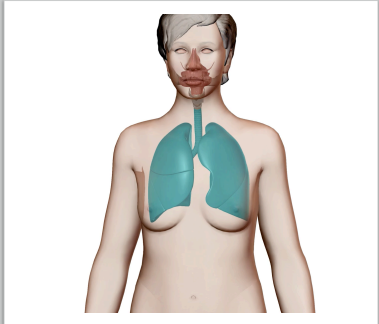
- The pharynx is divided into three parts: the nasopharynx, oropharynx, and laryngopharynx
- Oral cavity
- Esophagus



The Larynx

- The larynx is often called the voice box
- Other function of the larynx is to be an air passageway between the pharynx and the trachea



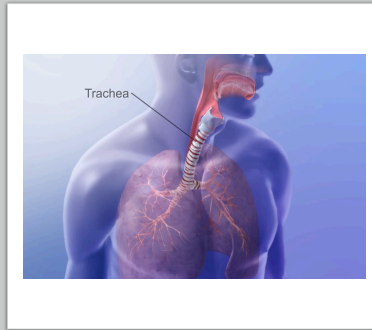


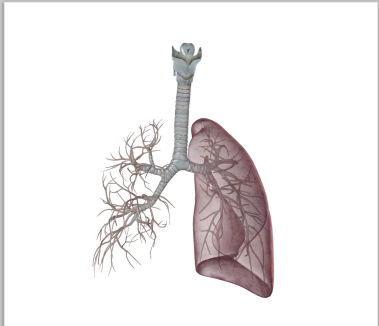
Lower Respiratory System

- Trachea
- Bronchi
- Bronchioles
- Lungs

The Trachea and Bronchi

- The trachea conveys air between the upper and lower respiratory structures
- There is between 15 and 20 C shaped rings that stop the trachea from collapsing or over expanding
- The trachea divides into the bronchi and bronchioles in the lungs



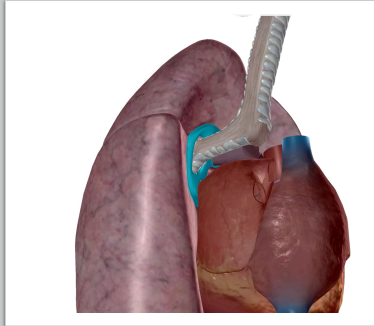


Trachea, Bronchi and Bronchial Tree

- Trachea
- Primary bronchi
- Secondary bronchi
- Tertiary bronchi
- Bronchioles

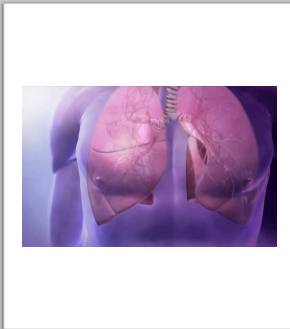
Blood Supply to the Lungs

- Hilum
- Lung
- Bronchi and bronchioles
- Circulatory vessels



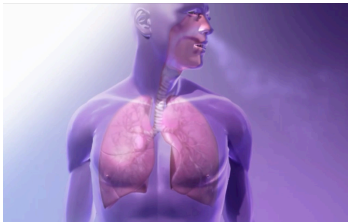
Alveoli and Gaseous Exchange

- Oxygen in the air is exchanged for waste carbon dioxide from the bloodstream.
- This process of external respiration takes place in hundreds of millions of alveoli [air sacs].
- Inhaled oxygen diffuses from the alveoli into the pulmonary capillaries into the bloodstream.
- Carbon dioxide from oxygen depleted blood diffuses from the capillaries into the alveoli

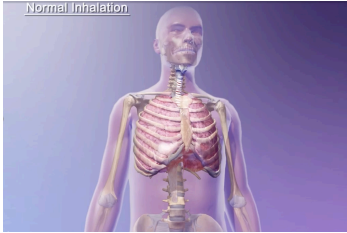


Dalton's Law [Law of Partial Pressure]

- Gas exchange occurs in the lungs as oxygen diffuses from the alveoli into the blood stream and carbon dioxide diffuse into the alveoli.
- Oxygen diffuse from the alveolus into the pulmonary capillary. Carbon dioxide diffuses out of the capillary and into the alveoli

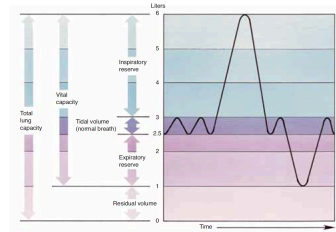


Normal Inhalation



Boyle's Law and Pulmonary Ventilation

- During normal inhalation, the diaphragm and external intercostal muscles contract and the ribcage elevates
- During normal exhalation, the muscles relax, and the lungs become smaller with the pressure inside them rises and the air is expelled.
- Boyle's law explains this relationship between volume and air pressure



Lung Volume

- Tidal volume
- Minute respiratory volume
- Inspiratory reserve
- Expiratory reserve
- Vital capacity
- Residual air



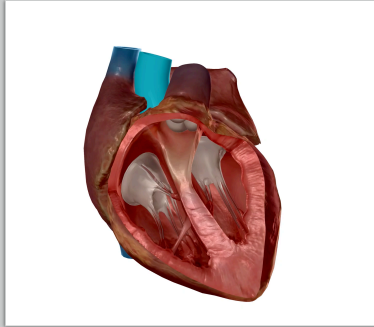
Breathing Rate and Regulation

- The rate of normal breathing is 12-15 breaths per minute
- When the body uses more oxygen or holds too much carbon dioxide sensors in the circulatory system called chemoreceptors send signals to the brain

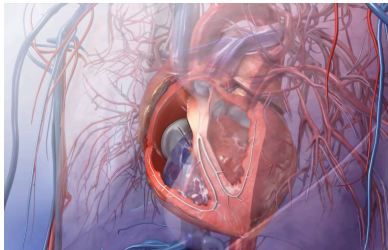
The Heart

•There are 4 chambers in the heart.

- Right Atrium
- Right Ventricle
- Left Atrium
- Left Ventricle



Circulatory System



Systemic

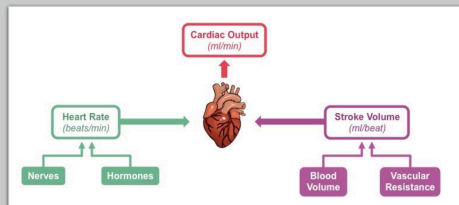
Sends O₂ enriched blood on from the Y and carries it around the body and returns back to the Y

Pulmonary

Sends CO₂ enriched blood from the Y to the lungs and brings it back to the Y with fresh O₂

Cardiac Output (Q)

- (Q) is the volume of blood pumped out by the left ventricle in one minute
- Cardiac Output (Q) = SV x HR



Blood Pressure

BP = blood flow x resistance

Systolic BP is the force with which the blood is pushing against the artery walls when the ventricles are contracting

Diastolic BP gives valuable information about the resistance of the blood vessels

