

Chapter 18 Respiration and Excretion

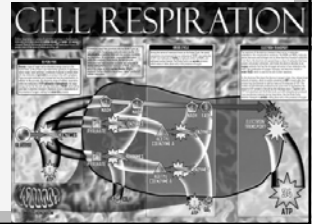
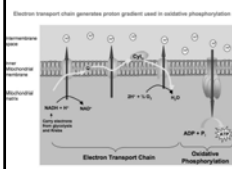
Try not to breathe on me. Your breath stinks!



Guess what honey, respiration and breathing are different.

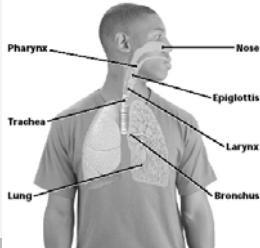
Section 1 The Respiratory System

Respiration = process in which oxygen and glucose undergo a complex series of chemical reactions inside cells - energy gets released that is used for running the cell and to fuel cell growth - carbon dioxide and water produced from respiration - respiration and breathing are different - respiration (cellular respiration) takes place inside of cells - breathing takes place in lungs -



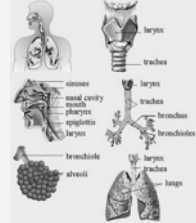
-when you take a breath air travels through your nose, pharynx, trachea, and bronchi

- nose hair filter air and warms it – mucus moistens air and traps small particles along with bacteria – cilia push the particles into the throat where they are swallowed and destroyed by the stomach –

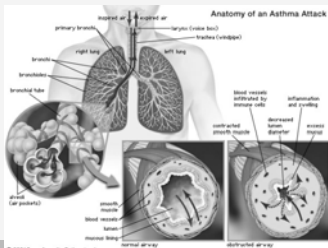


-pharynx (throat) is where nose and mouth come together

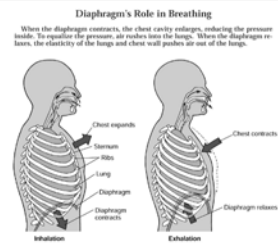
- trachea (wind pipe) = a tube with a series of ridges made of cartilage – lined with mucus and cilia which move mucus toward the pharynx and also moistens and cleans air – epiglottis folds over to seal off from food -



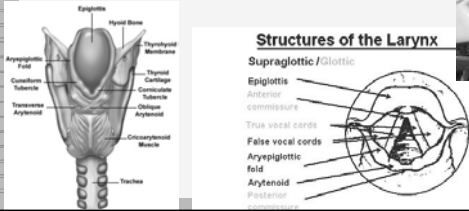
- Bronchi branches off from the trachea – directs air into lungs – once inside the lungs the bronchi keep branching off into smaller and smaller tubes – at the end of the tubes are alveoli = tiny sacs of lung tissue where diffusion happens with capillaries/blood stream– alveoli allow for greater surface area for the diffusion (gas exchange) to take place



When you breath in your rib muscles pull your chest upward and out – at the same time the diaphragm contracts, pulling your chest cavity down - combination increases the space and decreases the pressure inside the lungs– this pulls air into the lungs – when you breath out, the cavity gets smaller, increasing the pressure on the inside of the lungs pushing the air out

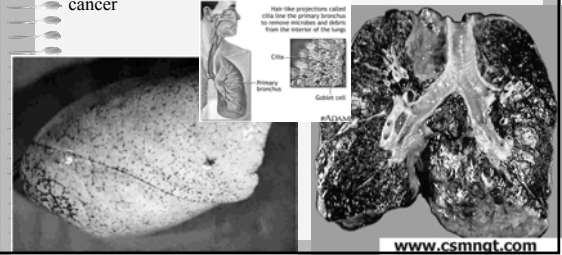


- Larynx (voice box) is located at the top of the trachea under the epiglottis – vocal cords are folds of connective tissue that produce your voice - they stretch across the opening of the larynx – muscles control the opening, controlling air movement across the vocal cords - vibrations create the sound waves – the longer the cords the deeper the voice – this is why men have deeper voices than women – boys and girls in childhood have the same size cords



Section 2 Smoking and Your Health

Tar = dark, sticky substance that forms when tobacco burns – settles on the cilia that line the trachea and other respiratory organs – makes the cilia to clump together and not work properly– inside of tar are chemicals that cause cancer



Carbon Monoxide = colorless, odorless gas – dangerous to inhale because it binds to hemoglobin in red blood cells and does not allow the hemoglobin to pick up oxygen – breathing rate must increase to make up for the lack of oxygen and increases your heart rate

The invisible killer

Carbon monoxide is a colorless, odorless gas that is produced by the incomplete combustion of carbon-containing fuels. It is a highly toxic gas that binds to hemoglobin in red blood cells, preventing them from carrying oxygen to the body's tissues.

HEALTH EFFECTS:

- At low levels, CO causes mild symptoms that often go undetected. These include headache, dizziness, fatigue, and nausea.
- At higher concentrations, it causes confusion, disorientation, and loss of consciousness.
- At very high levels, it can cause death.

SOURCES OF CO:

- Car exhaust
- Gas stoves and heaters
- Generators and other combustion engines
- Exhaust from boats, planes, and trains
- Fireplaces and stoves

Red Blood Cell

Oxygen

Carbon Monoxide (deadly fumes)

Oxygen

Nicotine – speeds up the activities of the nervous system, heart, and other organs – makes the heart beat faster and increases blood pressure – creates a physical addiction

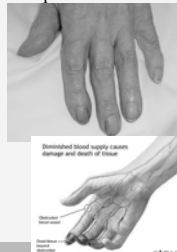
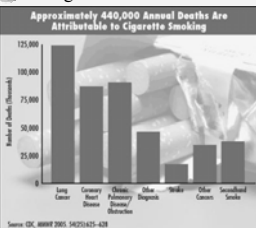
Acetyl Choline

Nicotine

Quitting smoking, a healthy diet and exercise may reduce your risk of heart disease

Other problems from smoking

- 1) mucus build up = limits the space for air to flow and traps cilia
- 2) decrease oxygen uptake
- 3) chronic bronchitis = irritation of breathing pathways clogged from mucus – can cause permanent damage



- 4) increased infections – build up of mucus allows small microorganisms a place to take hold
- 5) emphysema – disease that destroys lung tissue and causes difficulty breathing – can not breath in enough oxygen or breath out their carbon dioxide = permanent damage that can not be fixed over time
- 6) lung cancer – 40 different chemicals found in cigarettes that cause cancer
- 7) heart attack – atherosclerosis by chemicals in blood irritating the blood vessels and causing fatty material build up

Plaque in coronary artery

Quitting smoking, a healthy diet and exercise may reduce your risk of heart disease

Non-smoker Normal Enzyme Level

Smoker Reduced Enzyme Level

- Choosing not to smoke is very important but so is not being around smokers – 2nd hand smoke (passive smoking) can cause same health problems – learn how to say no and make good choices – IT CAN HAPPEN TO YOU!!! YOU CAN BECOME ADDICTED AND YOUR HEALTH CAN BE COMPROMISED!!!

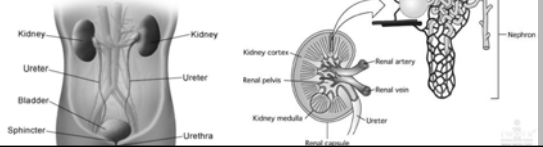


Section 3 The Excretory System

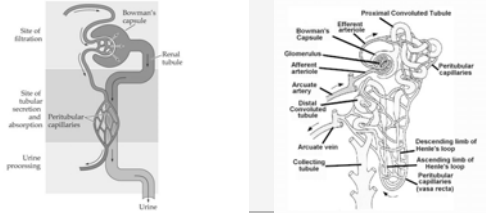
- collecting waste produced by cells and removes waste from the body – ex. Kidneys, skin, liver, etc.

Kidneys = major organs of the excretory system – eliminates urea (biprodukt from the breakdown of protein), excess water, and other waste materials – eliminated as urine – they filter your blood – ureters carry urine from the kidneys to the urinary bladder – when bladder stretched makes you feel the need to urinate – urine flows out through your urethra

Front View of Urinary Tract



- each kidney has millions of nephrons – each nephron removes waste from blood to produce urine – Nephrons regulate water and soluble matter (especially electrolytes) in the body by first filtering the blood under pressure, and then reabsorbing some necessary fluid and molecules back into the blood while secreting other, unneeded molecules.



Excretion examples = Kidneys filter blood – carbon dioxide removed from body when breath out by lungs– sweat glands in skin eliminate water and some chemical wastes through perspiration – liver breaks down proteins into urea and recycles part of the hemoglobin molecule into bile which is used in digestion

The Liver

Located in the upper right of the abdomen, the liver processes nutrients, filters unwanted substances from blood and controls levels of hormones, acids, cholesterol and sugar in the body.

WATCH YOUR P's

This typically contains:

Uric acid	3.44
Bicarbonate ions	3.24
Calcium ions	1.74
Potassium ions	1.74
Sodium ions	41.6
Chloride ions	15.6
Water	81.4

Average urine volume per day for an adult = 1.4 litres

*Nitrogenous base/amine product of protein metabolism