

The Endocrine system

Communicating within the body using hormones

Although we rarely think about the endocrine system, it influences almost every cell, organ, and function of our bodies. The endocrine system is instrumental in regulating mood, growth and development, tissue function, metabolism, and sexual function and reproductive processes.

In general, the endocrine system is in charge of body processes that happen slowly, such as cell growth. Faster processes like breathing and body movement are controlled by the nervous system. But even though the nervous system and endocrine system are separate systems, they often work together to help the body function properly.

The foundations of the endocrine system are the hormones and glands. As the body's chemical messengers, **hormones** transfer information and instructions from one set of cells to another. Many different hormones move through the bloodstream, but each type of hormone is designed to affect only certain cells.

The major glands that make up the human endocrine system include the:

- **Hypothalamus** - a collection of specialized cells that is located in the lower central part of the brain, is the main link between the endocrine and nervous systems.
- **Pituitary gland** - Although it is no bigger than a pea, the pituitary gland, located at the base of the brain just beneath the hypothalamus, is considered the most important part of the endocrine system. It's often called the "master gland" because it makes hormones that control several other endocrine glands.
- **Thyroid** - These hormones control the rate at which cells burn fuels from food to produce energy.
- **Parathyroids** - Attached to the thyroid are four tiny glands that function together called the parathyroids. They release parathyroid hormone, which regulates the level of calcium in the blood with the help of calcitonin, which is produced in the thyroid.
- **Adrenal glands** - The adrenal glands have two parts, each of which produces a set of hormones and has a different function influence or regulate salt and water balance in the body increases blood pressure and heart rate when the body experiences stress.
- **Pineal body** - helps regulate when you sleep at night and when you wake in the morning.
- **Reproductive glands** (which include the ovaries and testes) - These hormones tell a person's body when it's time to make the changes associated with puberty,

Hypothalamus

Pituitary gland

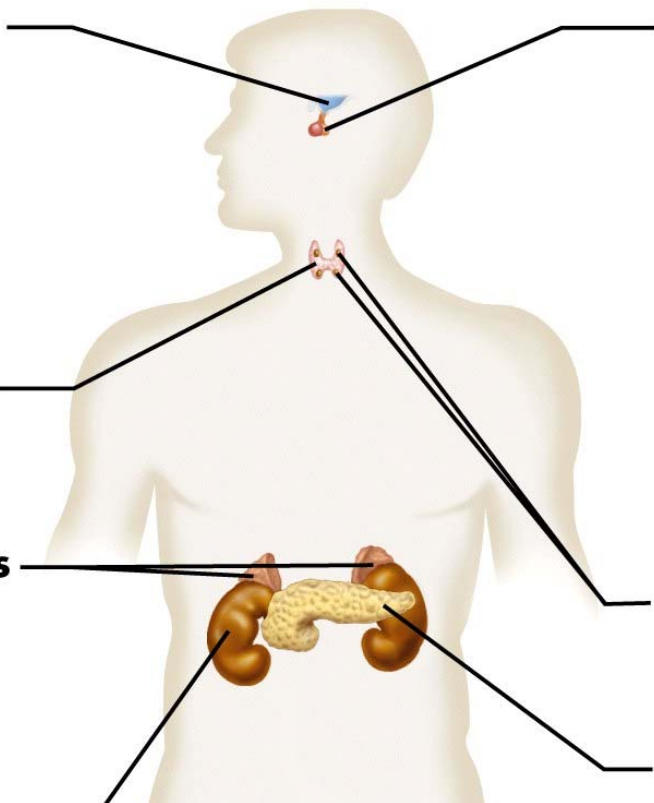
Thyroid gland

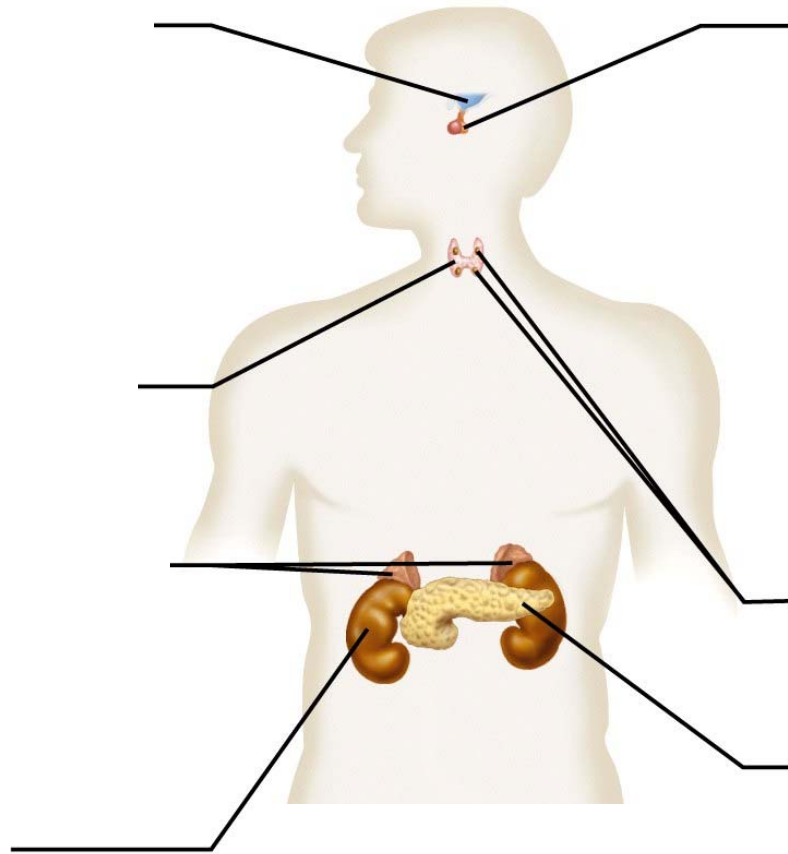
Adrenal glands

Parathyroid glands

Pancreas

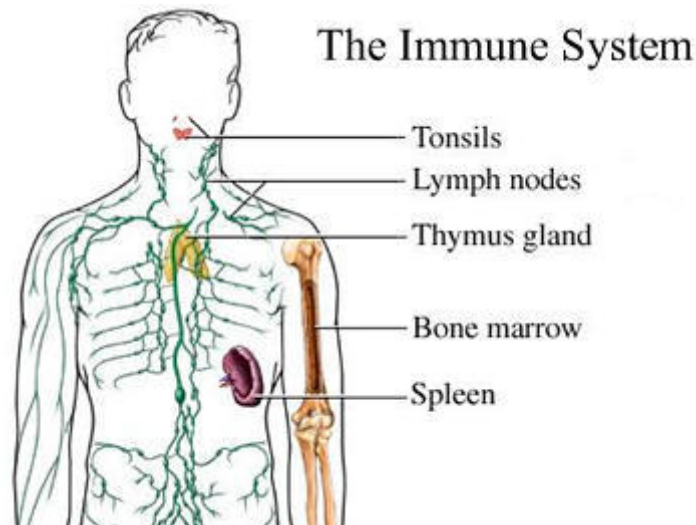
Kidneys





The Immune system

Defending against disease-causing agents
(includes the Lymphatic system)



The lymphatic system is an extensive drainage network that helps keep bodily fluid levels in balance and defends the body against infections.

The immune system, which is made up of special cells, proteins, tissues, and organs, defends people against germs and microorganisms every day. In most cases, the immune system does a great job of keeping people healthy and preventing infections. But sometimes problems with the immune system can lead to illness and infection.

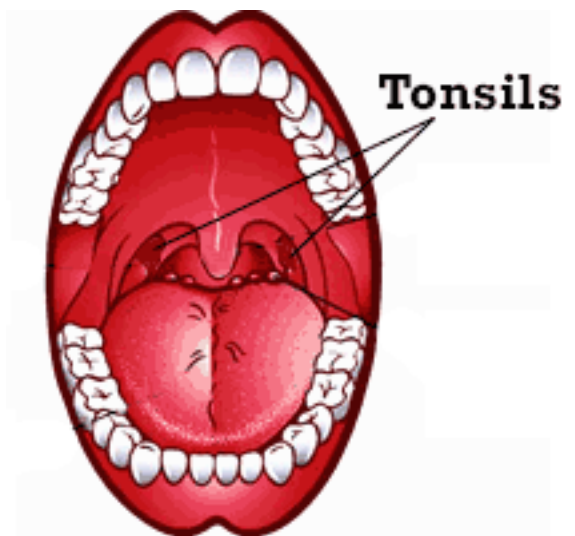
The immune system is the body's defence against infectious organisms and other invaders. Through a series of steps called the **immune response**, the immune system attacks organisms and substances that invade our systems and cause disease. The immune system is made up of a network of cells, tissues, and organs that work together to protect the body.

What Are Tonsils and Tonsillitis?

Tonsils are lumps of tissue located on either side of the back of the throat, and they help fight infections.

Tonsillitis happens when tonsils become infected by bacteria or viruses. The tonsils may become red and swollen or have a white or yellow coating on them. Other symptoms of tonsillitis can include:

- sore throat
- pain or discomfort when swallowing
- fever
- raspy voice
- swollen glands (lymph nodes) in the neck

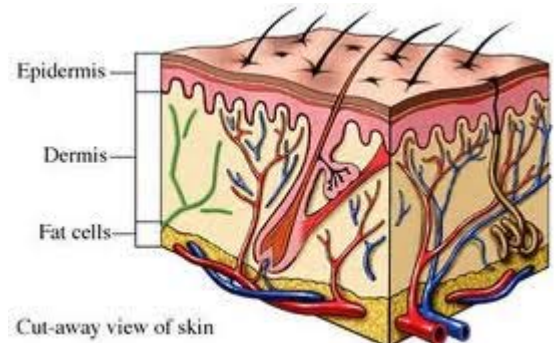


Lymph Nodes

The **lymph node** is a tiny bean-shaped gland, located in many different areas of the body. The main locations are the neck, under the arms, and in the groin. The body has over 300 filtering selected white blood cells and foreign elements. Each lymph node is also an important part of your immune system. Your lymph node filters fluids, catching viruses, bacteria, and other unknown materials.

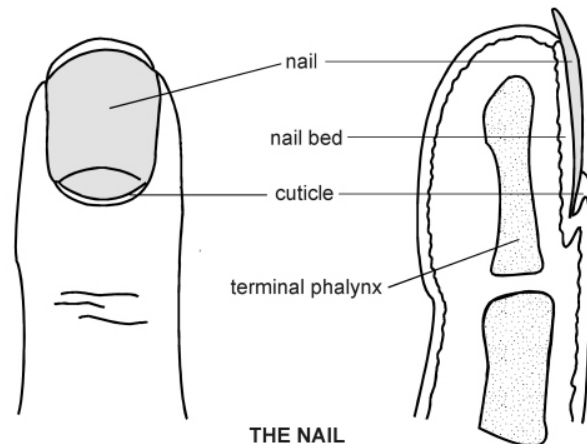
The Integumentary system: skin, hair and nails

Skin is our largest organ. If the skin of a typical 150-pound (68-kilogram) adult male were stretched out flat, it would cover about 2 square yards (1.7 square meters) and weigh about 9 pounds (4 kilograms). Our skin protects the network of muscles, bones, nerves, blood vessels, and everything else inside our bodies. Our eyelids have the thinnest skin, the soles of our feet the thickest.



Hair is actually a modified type of skin. Hair grows everywhere on the human body except the palms of the hands, soles of the feet, eyelids, and lips. Hair grows more quickly in summer than winter, and more slowly at night than during the day.

Like hair, **nails** are a type of modified skin. Nails protect the sensitive tips of fingers and toes. Human nails aren't necessary for living, but they do provide support for the tips of the fingers and toes, protect them from injury, and aid in picking up small objects. Without them, we'd have a hard time scratching an itch or untying a knot. Nails can be an indicator of a person's general health, and illness often affects their growth.



The Musculoskeletal System

The Muscular system: moving the body with muscles

Every time you sprint through the halls because you're late for class, score against your opponents during a game, or shoot pool with friends, you're using your bones, muscles, and joints. Without these important body parts, you'd be seriously sidelined — you'd be unable to sit, stand, walk, or do any of the activities you do every day.

From our head to our toes, our **bones** provide support for our bodies and help form our shape. The skull protects the brain and forms the shape of our face. The spinal cord, a pathway for messages between the brain and the body, is protected by the backbone, or spinal column. The ribs form a cage that shelters the heart, lungs, liver, and spleen, and the pelvis helps protect the bladder, intestines, and in girls, the reproductive organs. Although they're very light, bones are strong enough to support our entire weight.

Joints occur where two bones meet. They make the skeleton flexible — without them, movement would be impossible. **Muscles** are also necessary for movement: They're the masses of tough, elastic tissue that pull our bones when we move.

Together, our bones, muscles, and joints — along with tendons, ligaments, and cartilage — form our musculoskeletal system and enable us to do everyday physical activities.

Do you know?

You use 17 muscles when you smile.

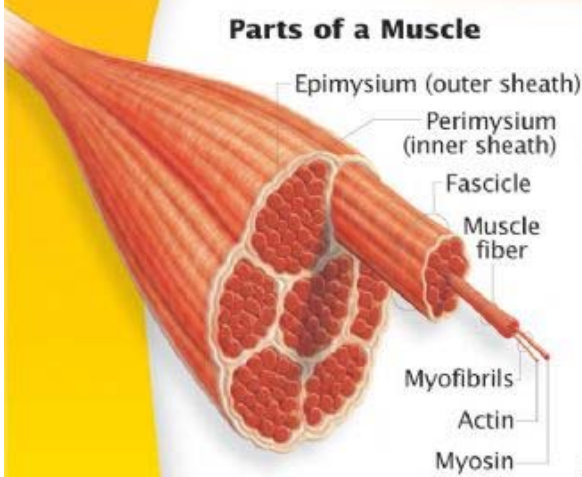
You use 43 muscles when you frown.



Muscular

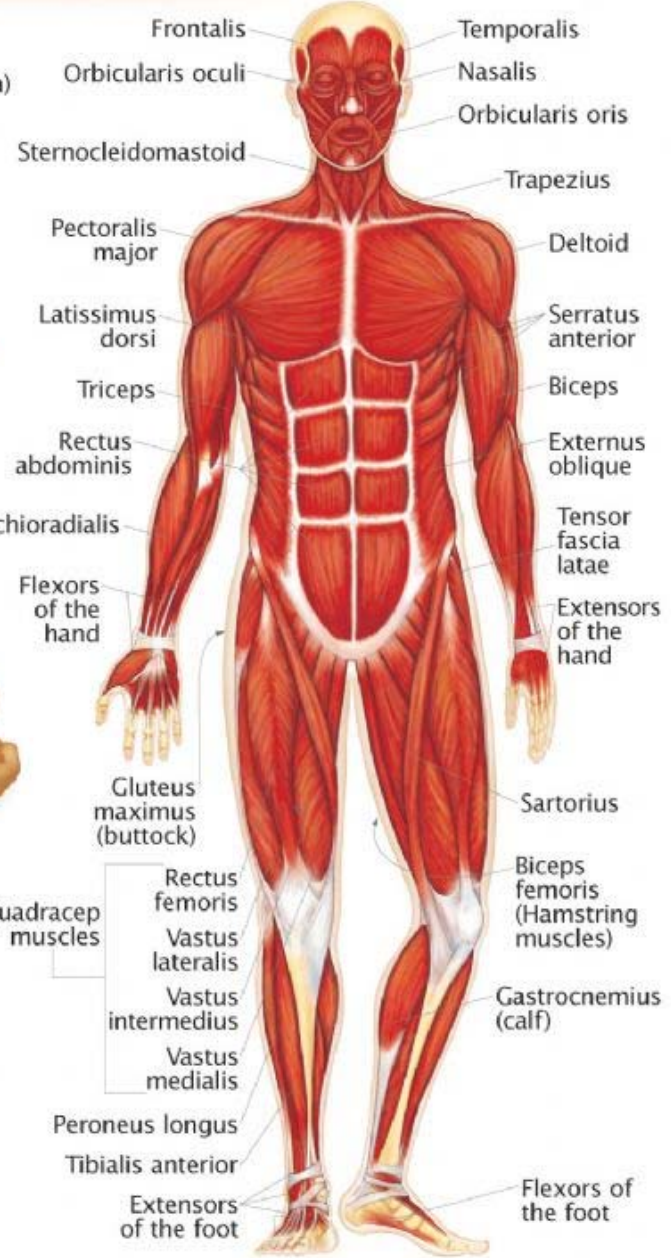
SYSTEM

Parts of a Muscle



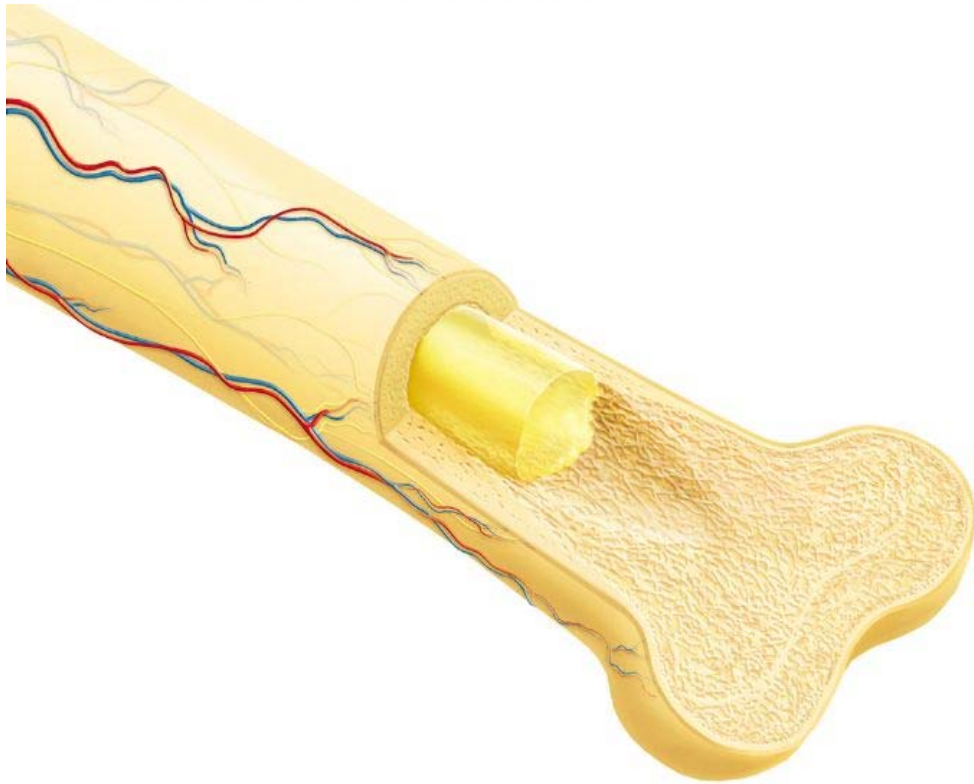
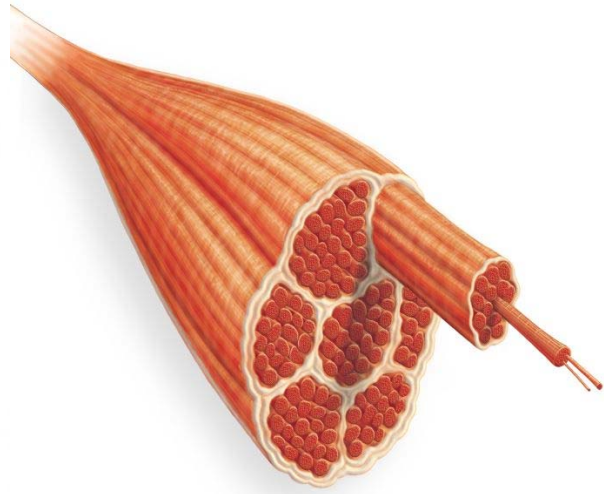
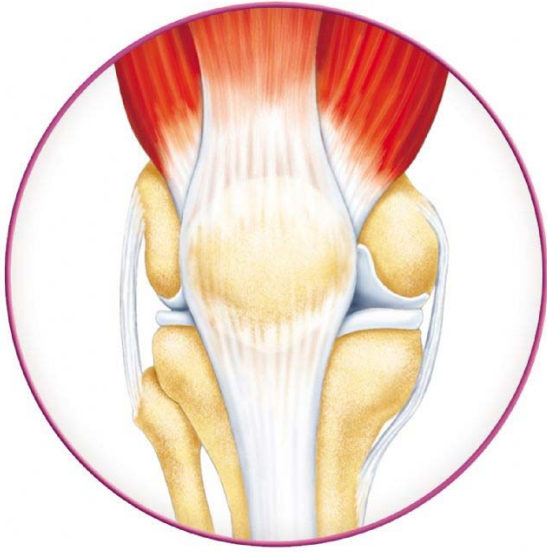
Extend & Flex

We have opposite sets of muscles.



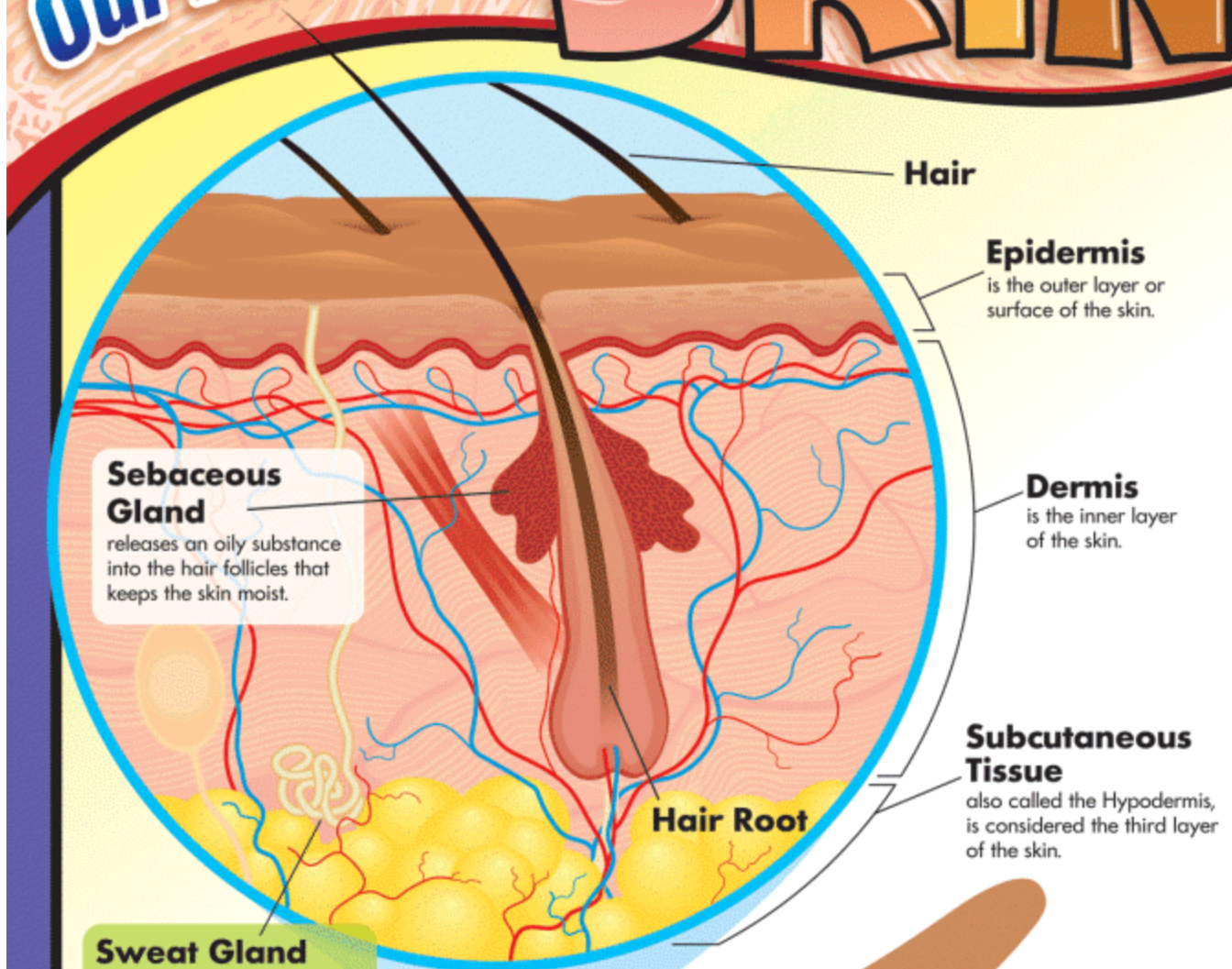
Quadracep muscles

- Rectus femoris
- Vastus lateralis
- Vastus intermedius
- Vastus medialis



Our Amazing

SKIN



Skin Care

- Wash and bathe frequently to keep your skin clean and breathing properly.
- Attend to cuts and scrapes to prevent infection.
- Limit exposure to the sun. Wear sunscreen.

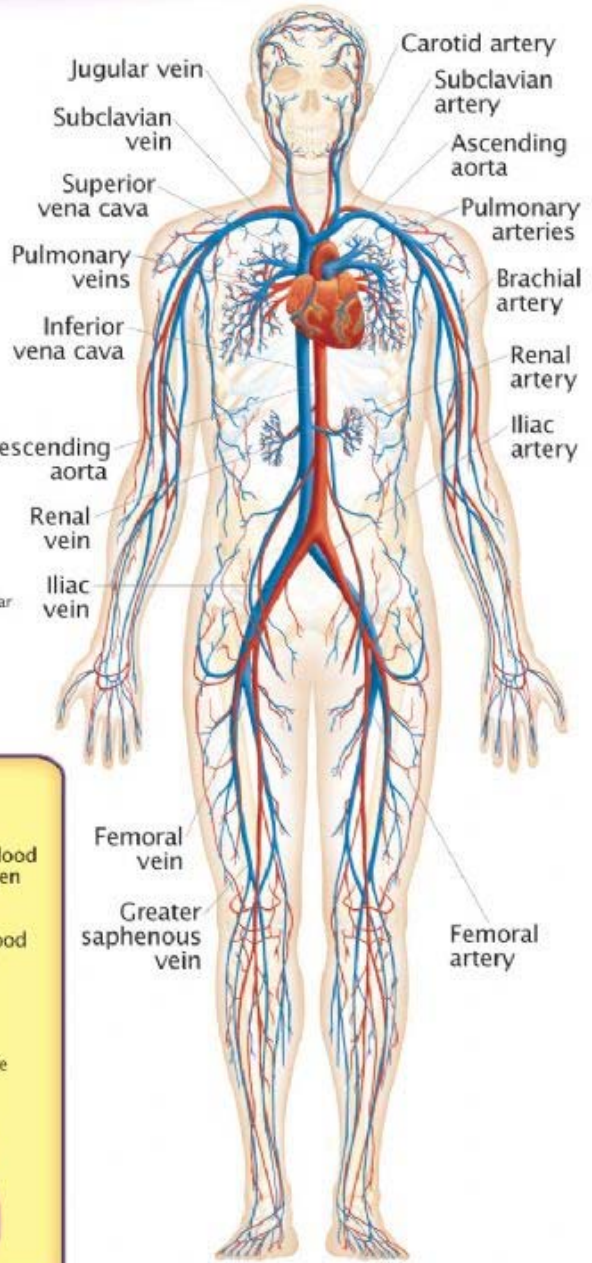
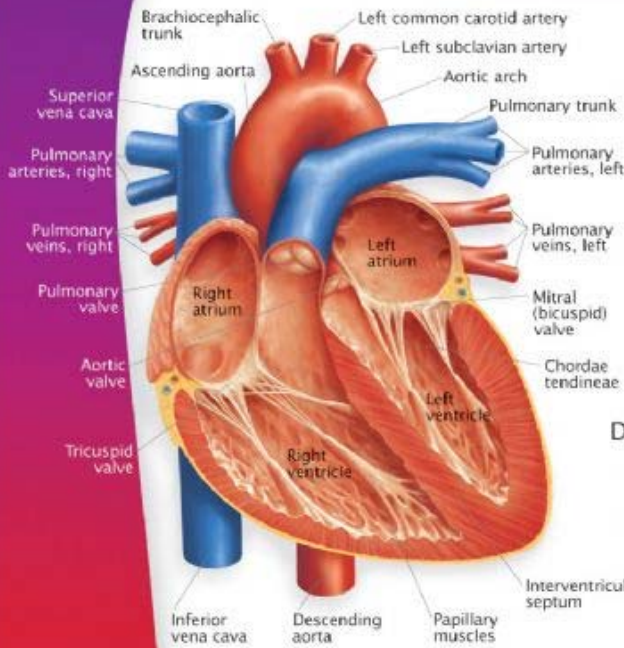
Did You Know?

- Skin is the largest organ of the human body.
- Your skin is home to nerve endings that provide you with the sense of touch.
- Your skin helps regulate your body temperature through perspiration and through expansion and contraction of the blood vessels.
- Your skin synthesizes vitamin D from sunlight.



Cardiovascular SYSTEM

Parts of the Heart



Cardiac Cycle

1. Collects blood with no oxygen
2. Pumps blood to lungs for oxygenation
3. Collects blood with oxygen
4. Pumps blood into body



The valves of the heart open and close as the heart muscle pushes blood through the chambers.

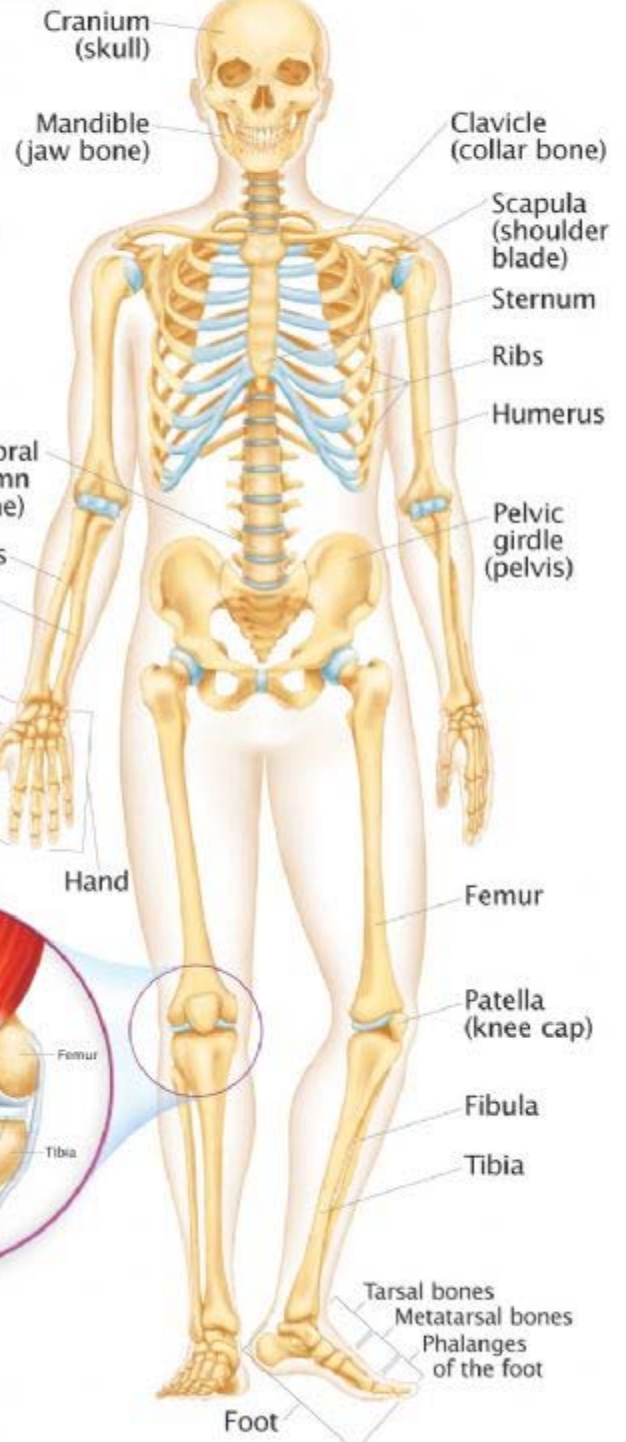
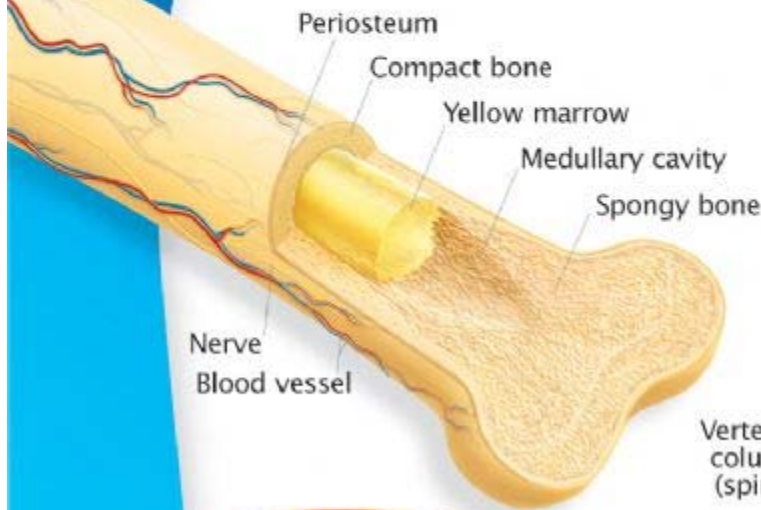




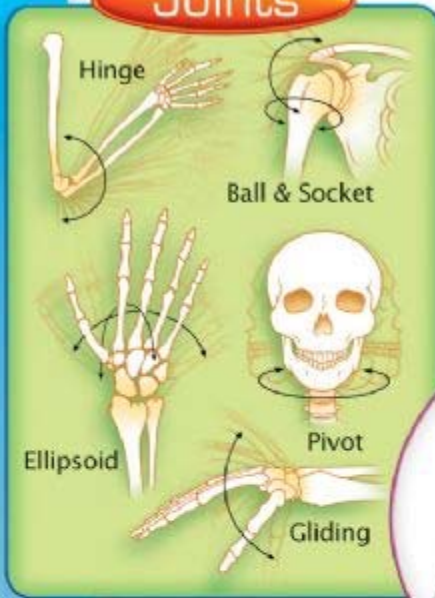
Skeletal

SYSTEM

Parts of a Bone



Joints



Ligaments
connect bone to bone

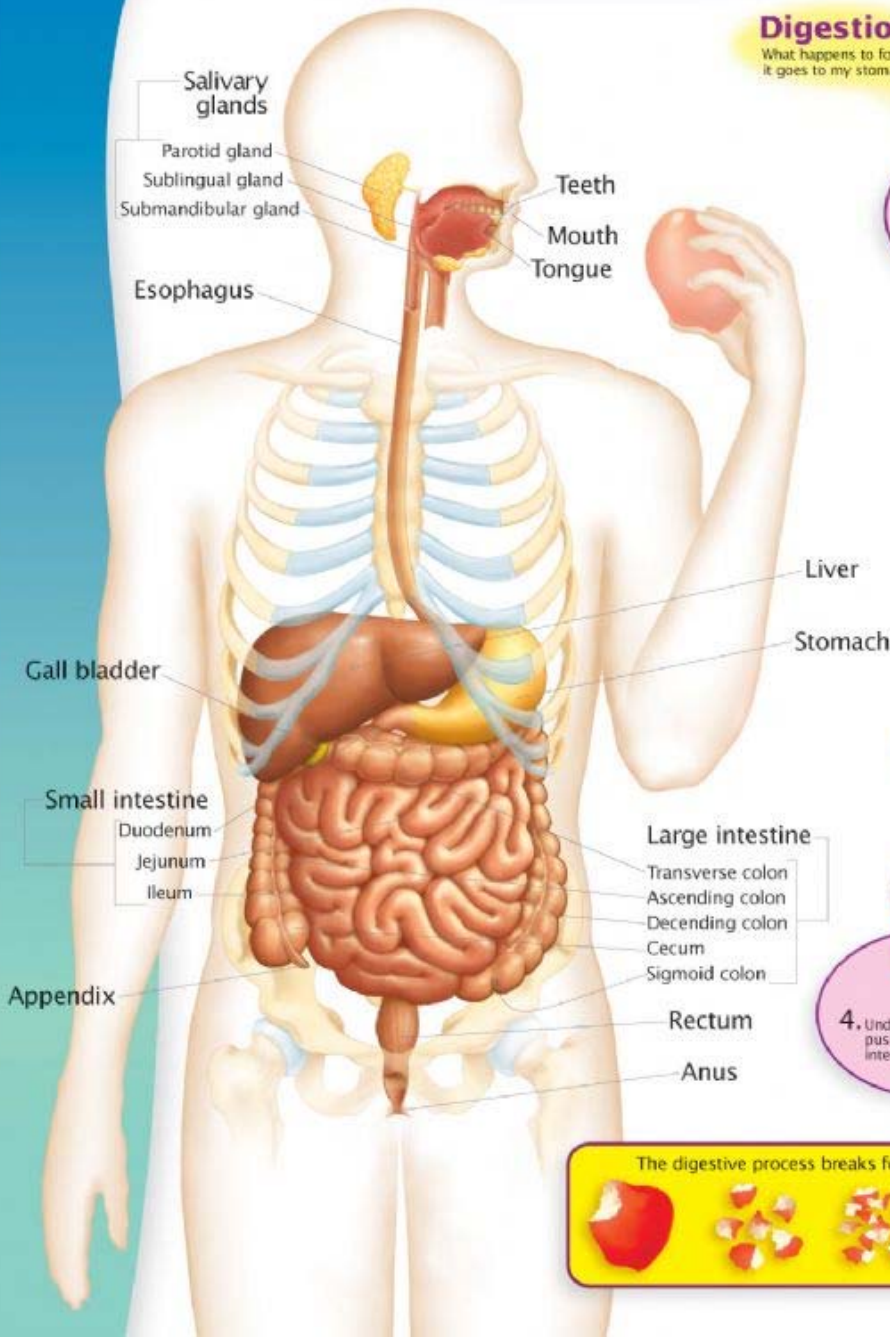
Tendons
connect muscles to bone

Cartilage
cushions between bones



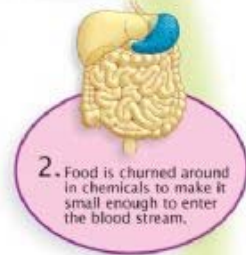
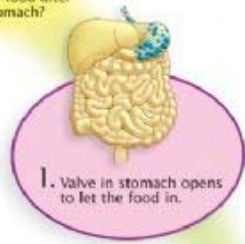
Digestive

SYSTEM



Digestion

What happens to food after it goes to my stomach?

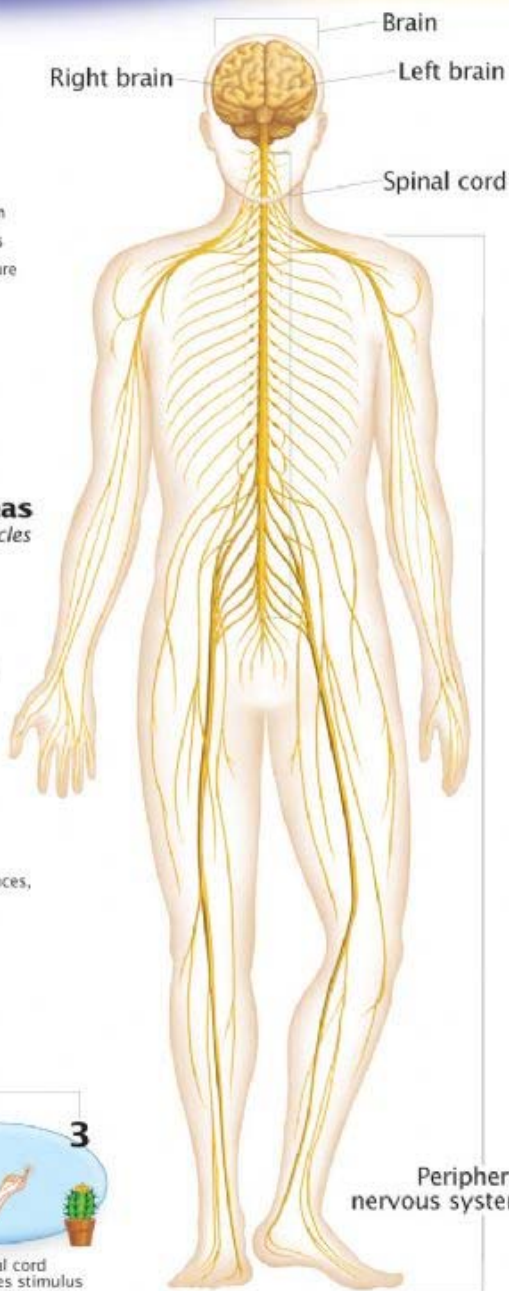
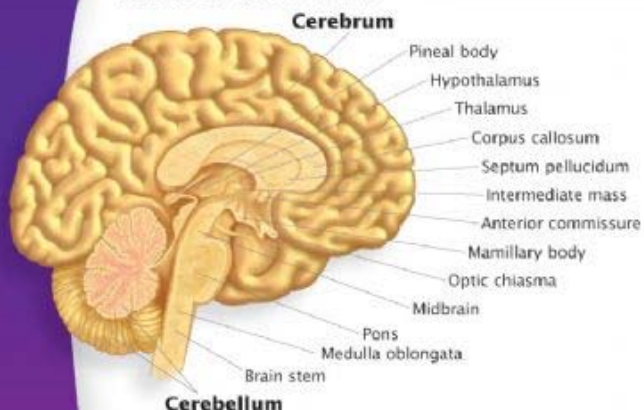




Nervous

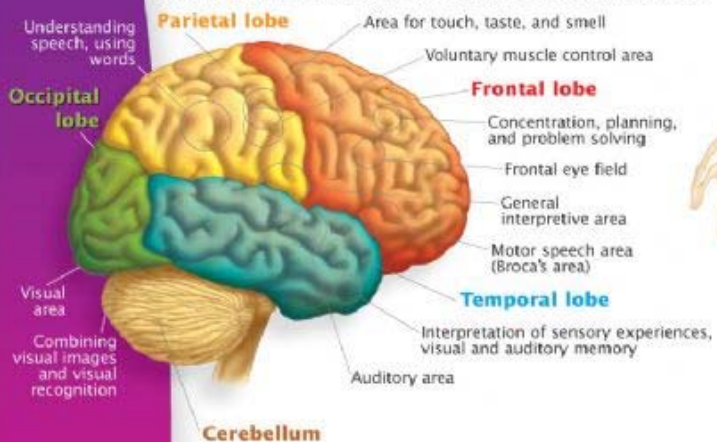
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Parts of the Brain



Sensory, Motor, and Association Areas

Motor areas involved with the control of voluntary muscles



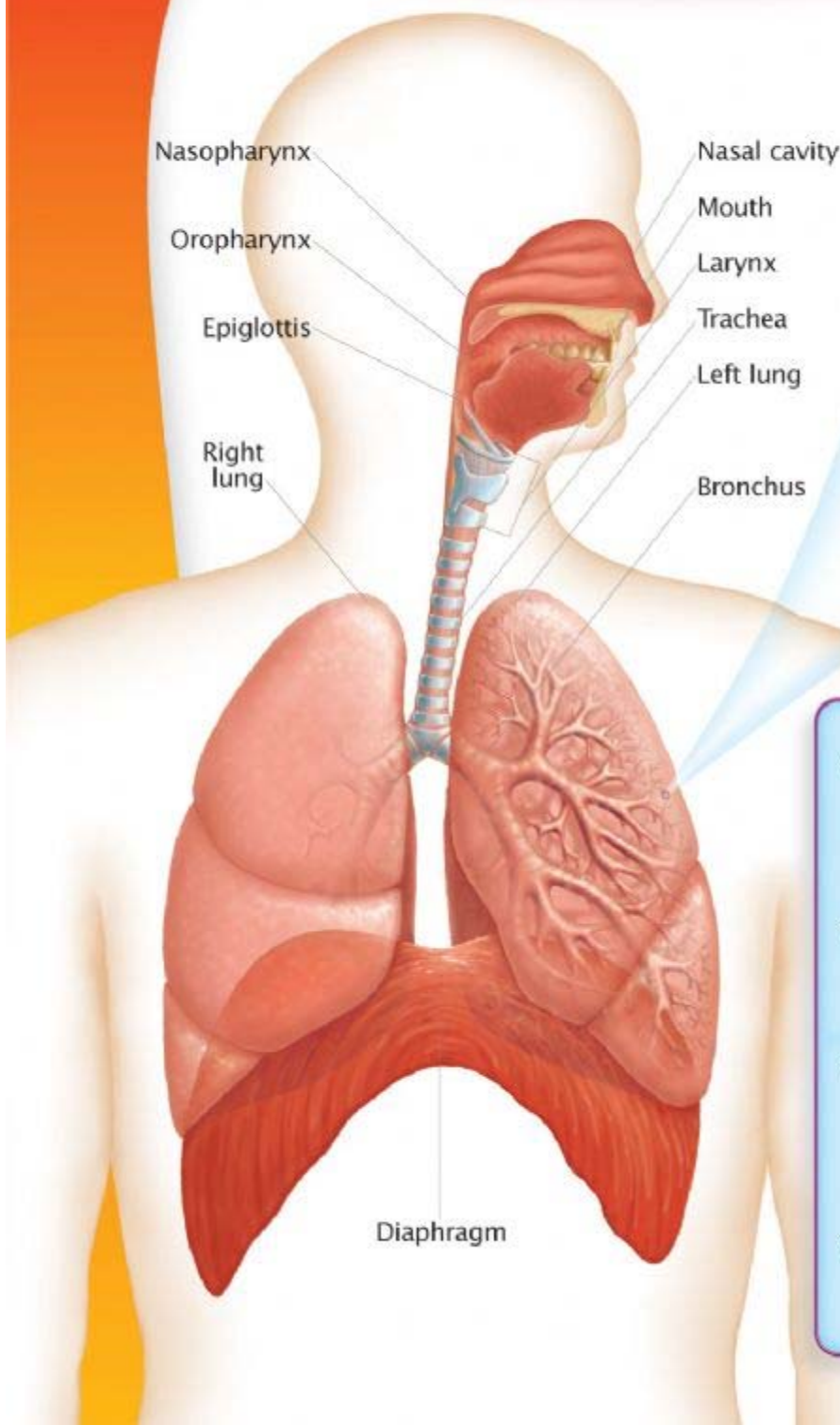
The Reflex Arc



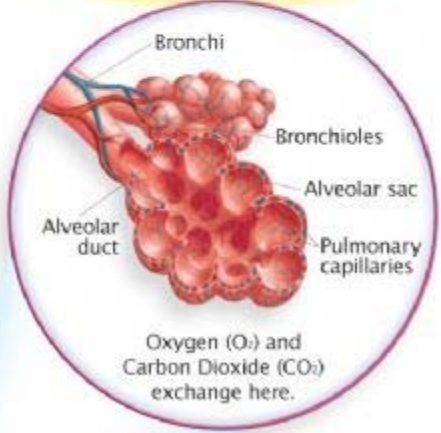


Respiratory

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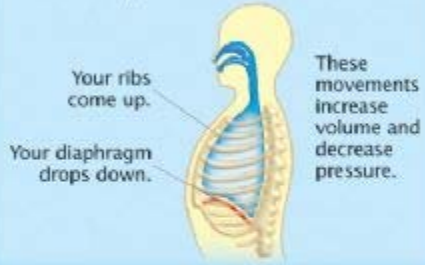


Gas Exchange



Breathing

What happens when I inhale?



What happens when I exhale?

