



**THE
MUSCULOSKELETAL
SYSTEM
&
THE
NERVOUS
SYSTEM**

MUSCULOSKELETAL SYSTEM

- This system is made up of all the bones in your body and all the muscles that make them move.



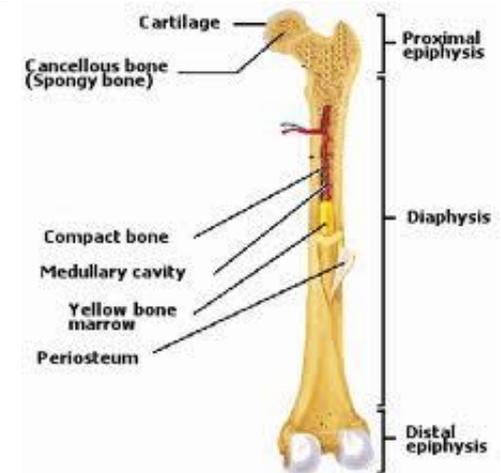
SKELETON

- Consists of 3 different types of connective tissue:
 - Bones
 - Ligaments
 - Cartilage



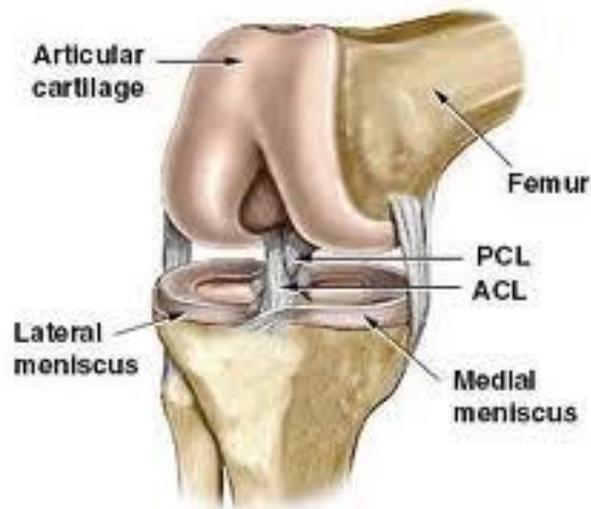
BONES

- Bone is hard and dense
- Made up of bone cells within a matrix of minerals (mainly Ca and P) and collagen fibres
- Canals inside the bones contain nerves and blood vessels
- Only a small percentage of bone is actually living



LIGAMENTS

- Tough and elastic
 - Hold bones together at the joints
- Made of mostly long fibres of collagen



CARTILAGE

- Dense tissue
- Found in the ear, nose, esophagus, the disks between our vertebrae and joints
- Made of special cells in a matrix of collagen fibres
 - Provides a strong, flexible, low-friction support for bones and other tissues

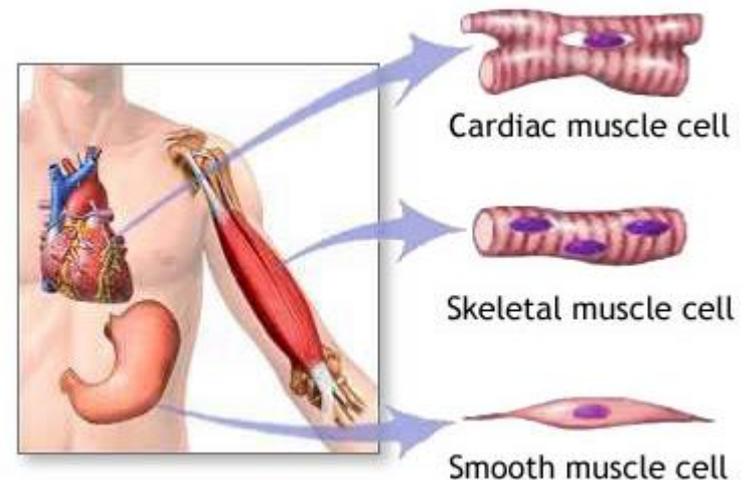


SKELETON FUNCTIONS

- Provides support and structure for our bodies and anchor points for muscles
- Protects our soft internal organs and brain
- Stores calcium and other minerals
 - Some contain marrow which produces red and white blood cells

MUSCLES

- Consists of 3 types of muscle tissue:
 - **Skeletal muscle:** voluntary; attached to bones by tendons, allowing body parts to move
 - **Smooth muscle:** involuntary; mainly in intestines
 - **Cardiac muscle:** only in heart



TENDONS

- Muscles and bones are connected by tendons
 - Tendons are similar to ligaments, but are less elastic



MUSCULOSKELETAL SYSTEM PROBLEMS

- **Osteoporosis:**
 - A disease that can affect people of all ages, but is more common in older women
- **Physical Stresses:**
 - Extreme movements can tear ligaments, tendons and muscle tissues
 - Severe movements can fracture bones

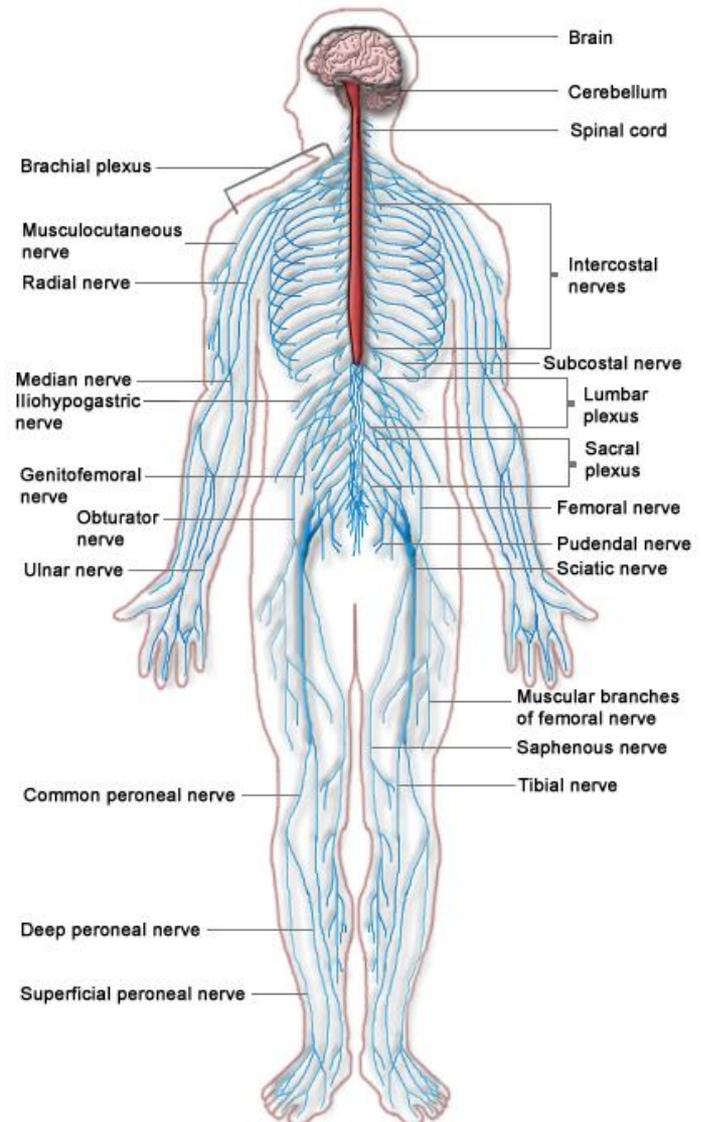
OSTEOPOROSIS

- Involves loss of bone tissue which makes bones brittle and weak
- Does not cause pain
- Tested for with a bone density test
- Linked with a loss of calcium in bones



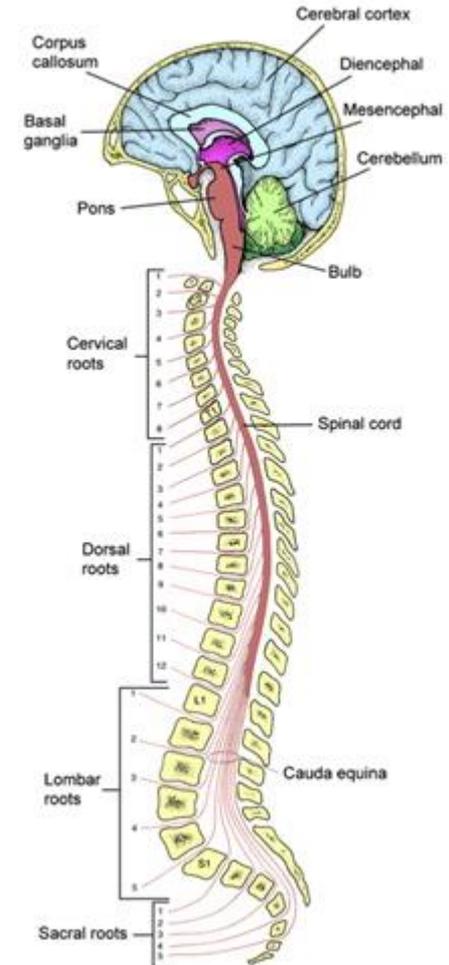
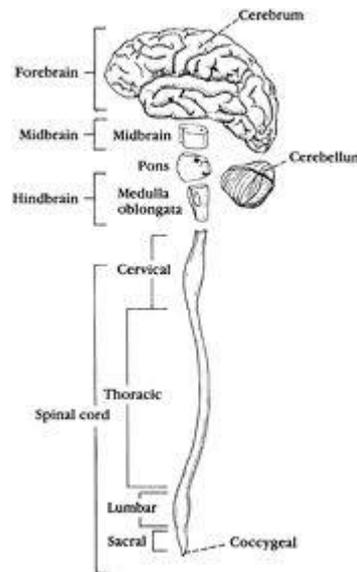
NERVOUS SYSTEM

- This system is made up of the brain, spinal cord and peripheral nerves.
- It is the system that senses the environment and coordinates appropriate responses.



CENTRAL NERVOUS SYSTEM

- CNS
- Consists of the brain and spinal cord

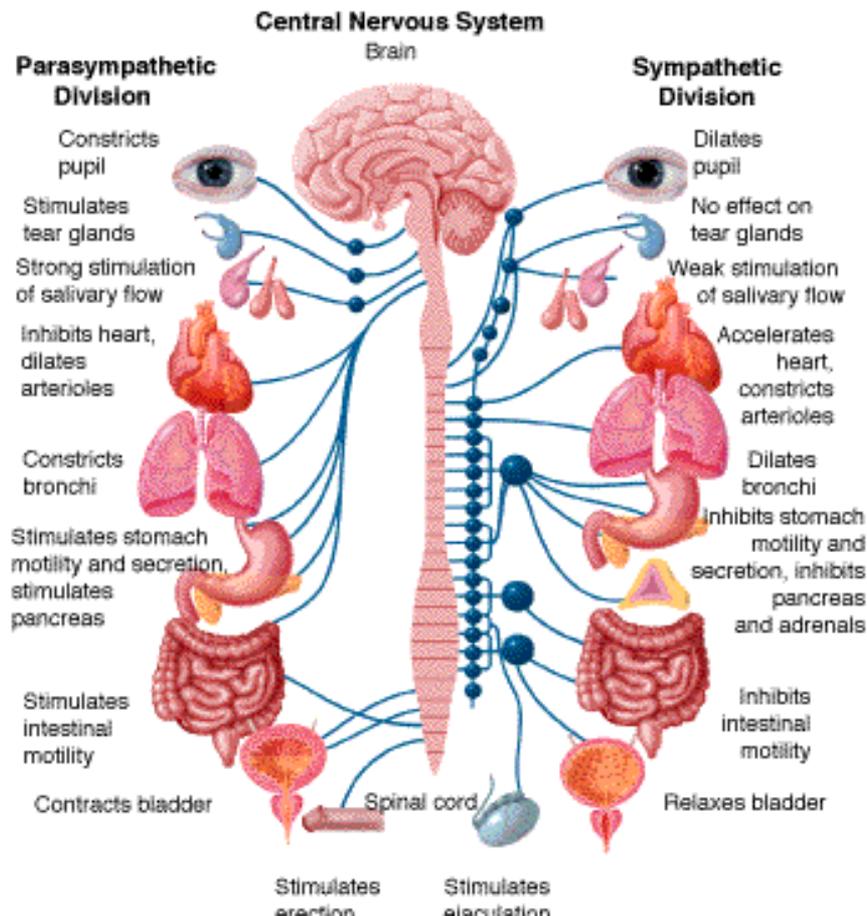


CNS

- The skull protects the brain and the spine guards the spinal cord
- Surrounded by cerebrospinal fluid which helps to cushion them from injury, transports chemicals and removes wastes that are produced in the brain.

PERIPHERAL NERVOUS SYSTEM

- Consists of nerves that connect the body to the central nervous system



PNS

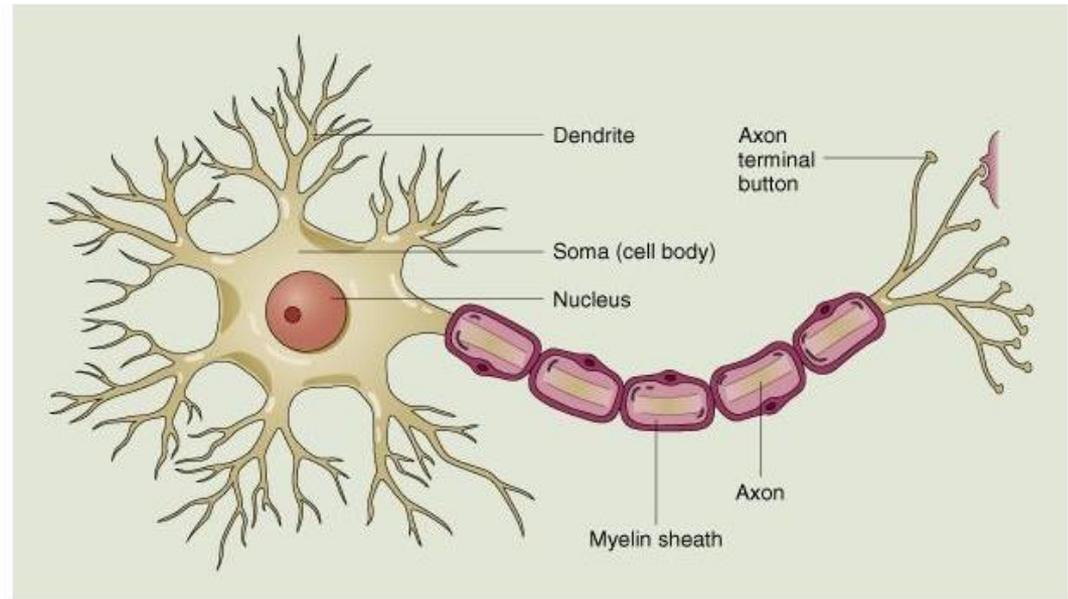
- Consists of 3 groups of nerves:
 - Nerves that control the voluntary muscles
 - Nerves that carry information from the sensory organs
 - Nerves that regulate involuntary functions such as breathing, heartbeat and digestion

NERVE TISSUE

- Found in the brain, spinal cord and nerves
- Nerve tissue is made up of special cells called neurons
- Nerves are bundles of neurons that are surrounded by connective tissue

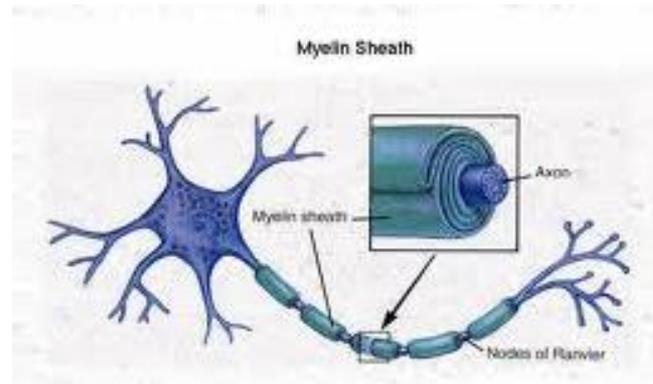
NEURONS

- Neurons' structure enables them to send information around the body by conducting electrical signals from one area of the body to another
- Injured neurons in the CNS do not easily regenerate



MYELIN

- Myelin sheath acts like the insulation on an electrical wire, preventing electrical impulses from passing to the wrong neuron.



NERVOUS SYSTEM PROBLEMS

- **Multiple Sclerosis**

- A disease caused by a malfunction of the immune system in which the myelin sheaths of neurons in the CNS are destroyed. Symptoms are muscle weakness, slurred speech and difficulty walking.

- **Head Injuries**

- A CT or MRI scan are suggested for someone that may have experienced physical trauma to the head or spinal cord.