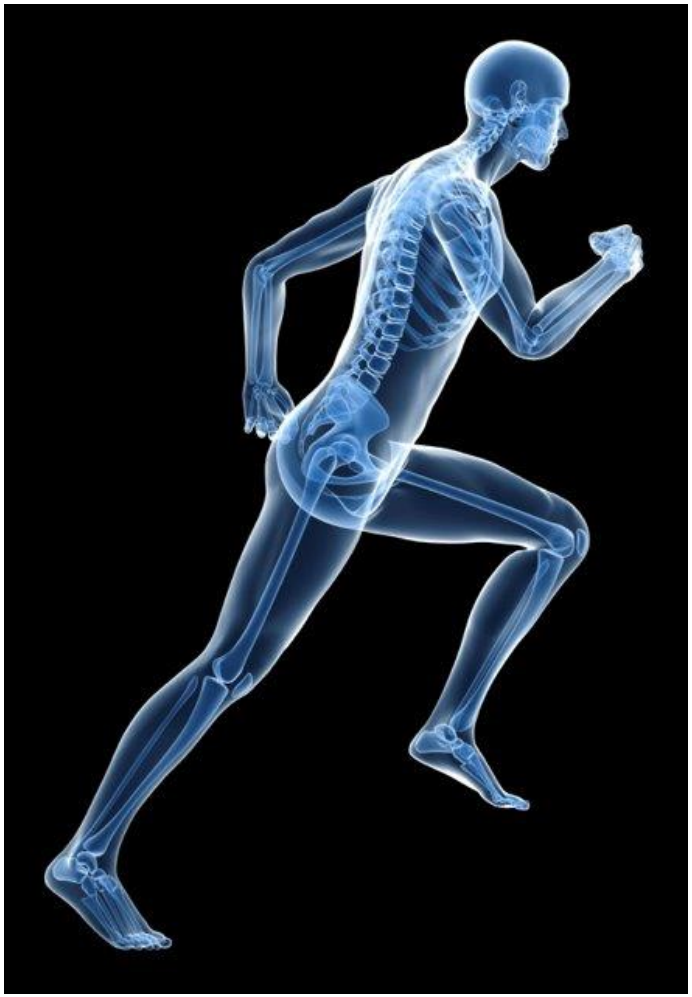
THE SKELETAL SYSTEM

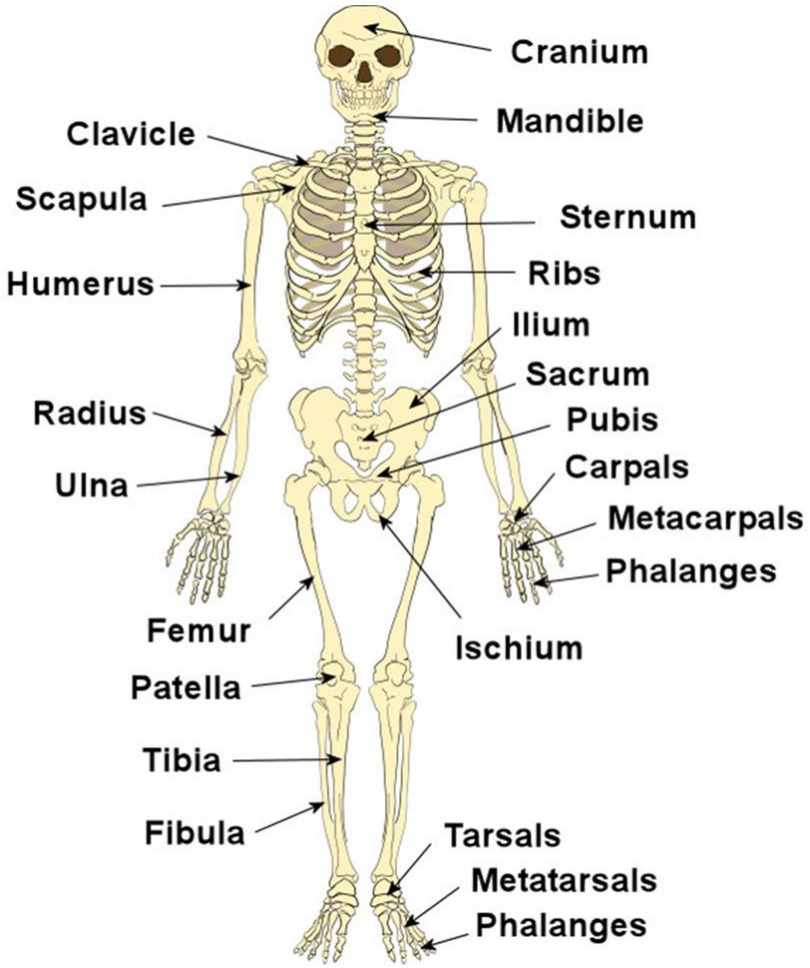
Middle School Health

The Main Functions



- Provides support for the body
- Protects internal organs from damage
- Acts as the framework for attached muscles
- Produces red and white blood cells
- Allows movement of limbs

2 Main Parts of Skeletal System

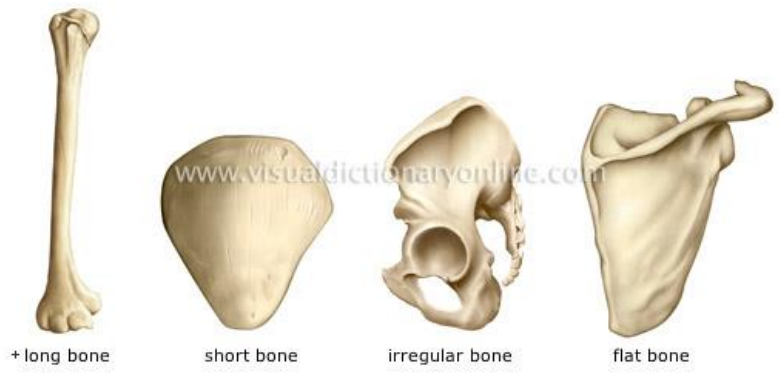


1. <u>Axial</u>
   - Center of skeleton
     - Ribs, sternum, skull, and spine

2. <u>Appendicular</u>
   - All the limbs outside the axial skeleton

4 Types of Bones

- Long Bones
  - Humerus, Femur (arm and leg bones)
- Short Bones
  - Found in wrist and ankle (carpals and tarsals)
- Flat bones
  - Ribs, Scapula
- Irregular Bones
  - Vertebrae



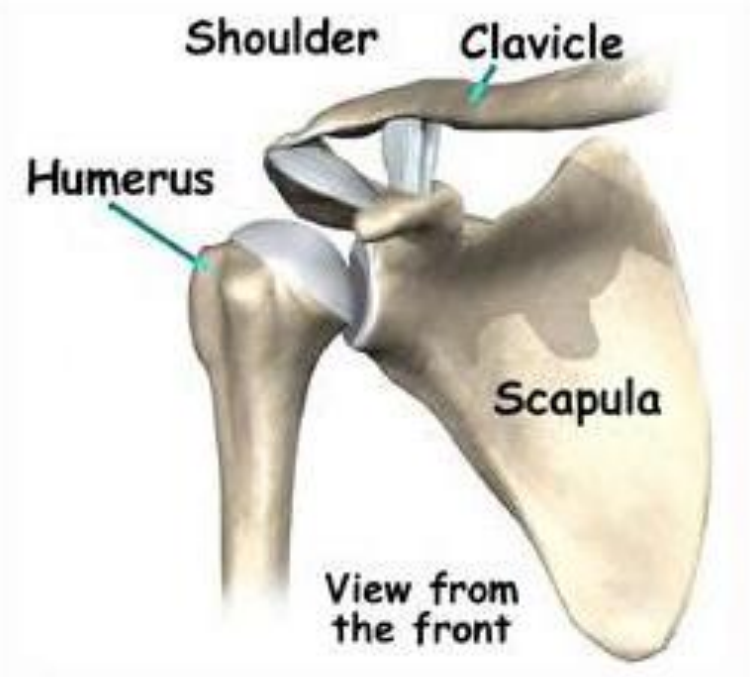
Types of Joints

1. Joint – a location in the body where two or more bones meet to enable movement.
2. Ball and Socket Joint
   - Enables wide range of motion
   - Example – shoulder and hip
3. Hinge Joint
   - Lesser range of motion than ball and socket
   - Example elbow and knee
4. Pivot Joint
   - Enables rotation of head and forearm

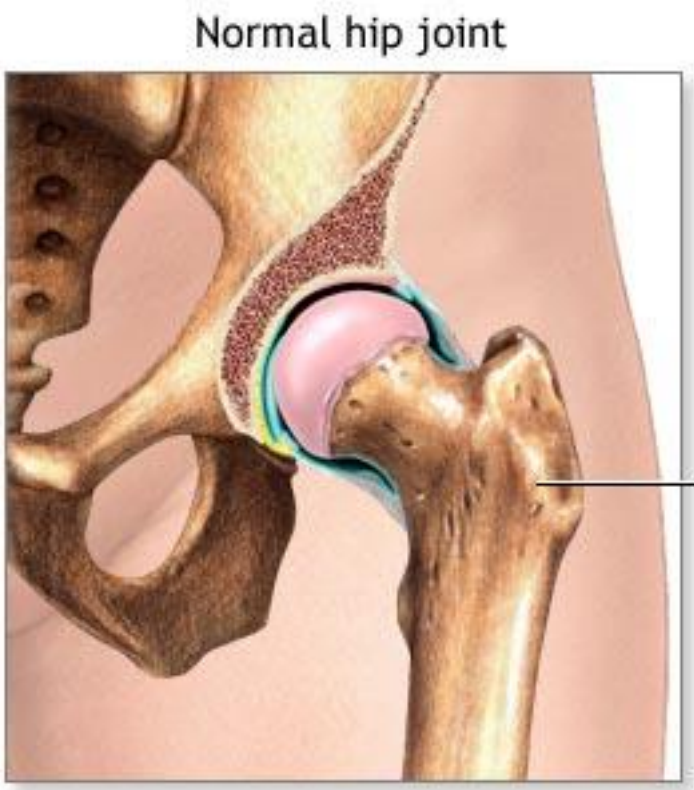
2 LAYERS OF BONE

1. Periosteum – Outer layer
   Dense, thick, and hard
2. Endosteum – Inner layer
   Less dense bone that is sponge like.

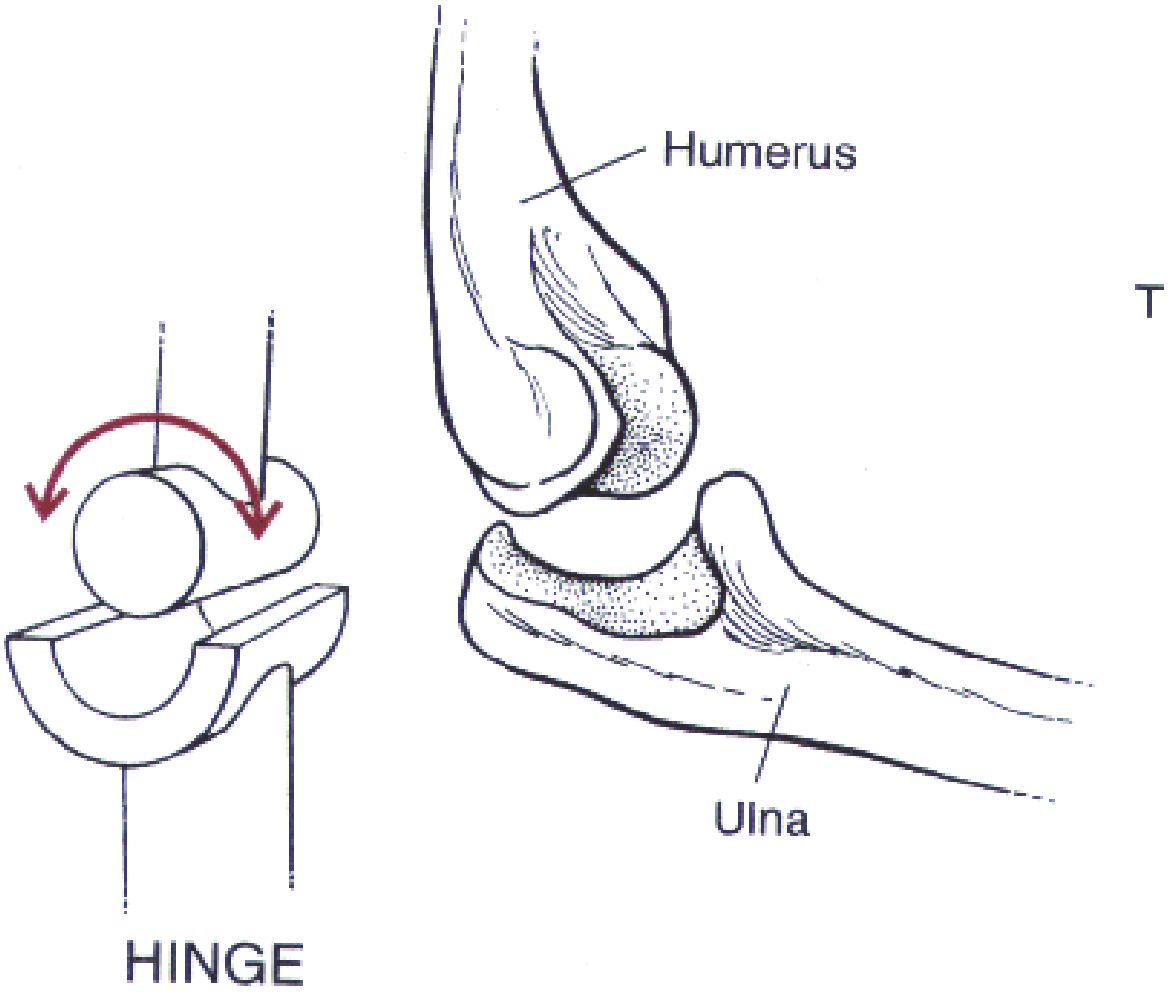
Ball and Socket Joint



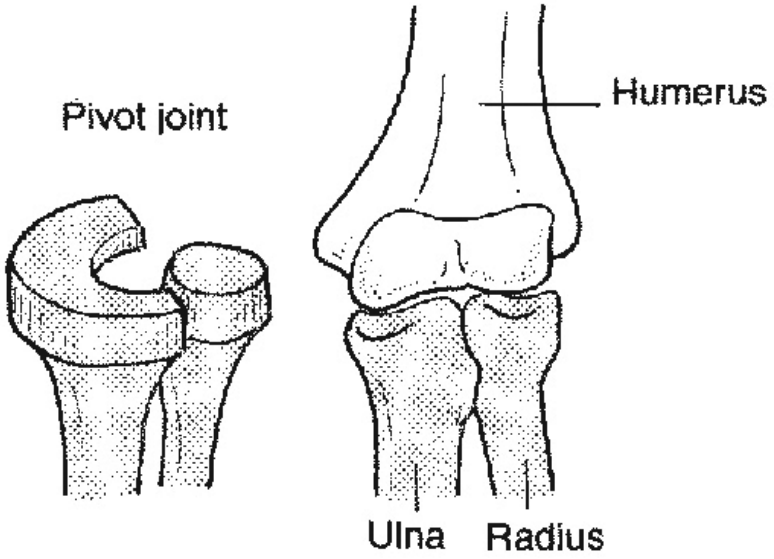
The shoulder joint

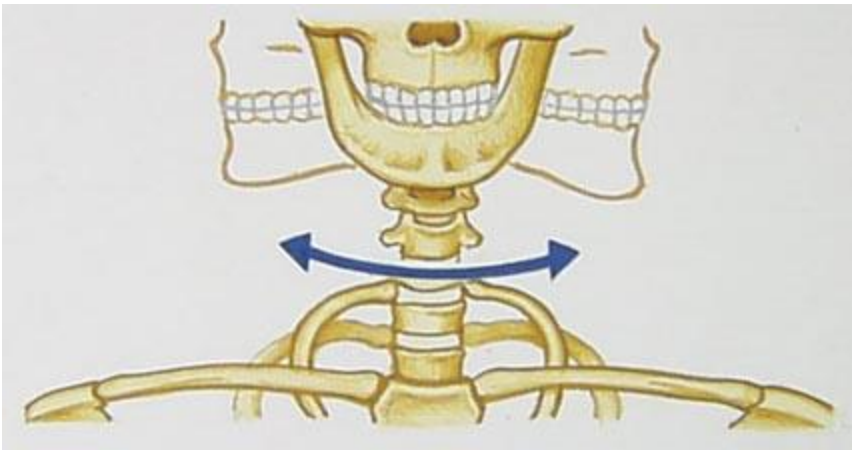


Hinge Joint



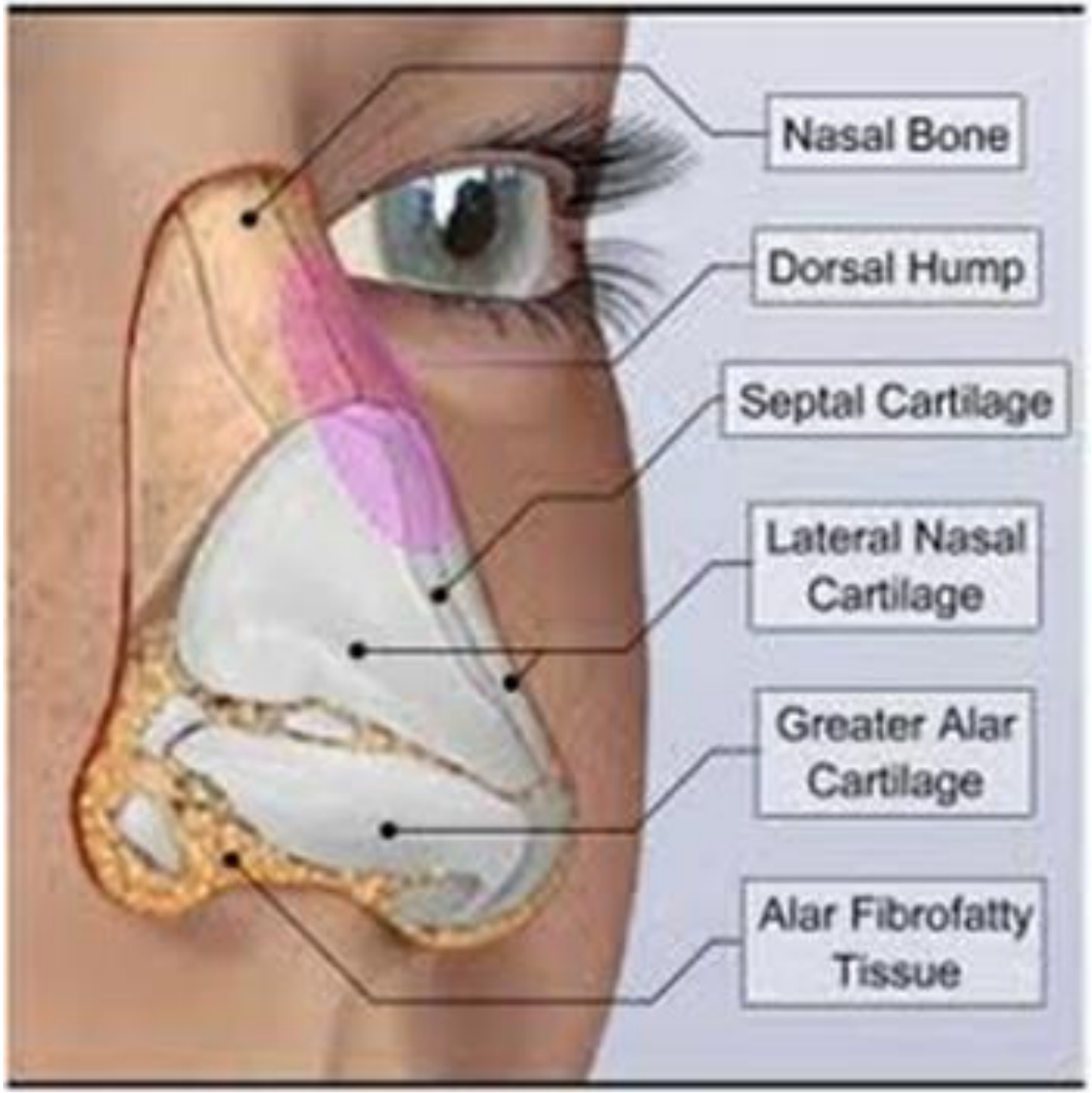
Pivot Joint

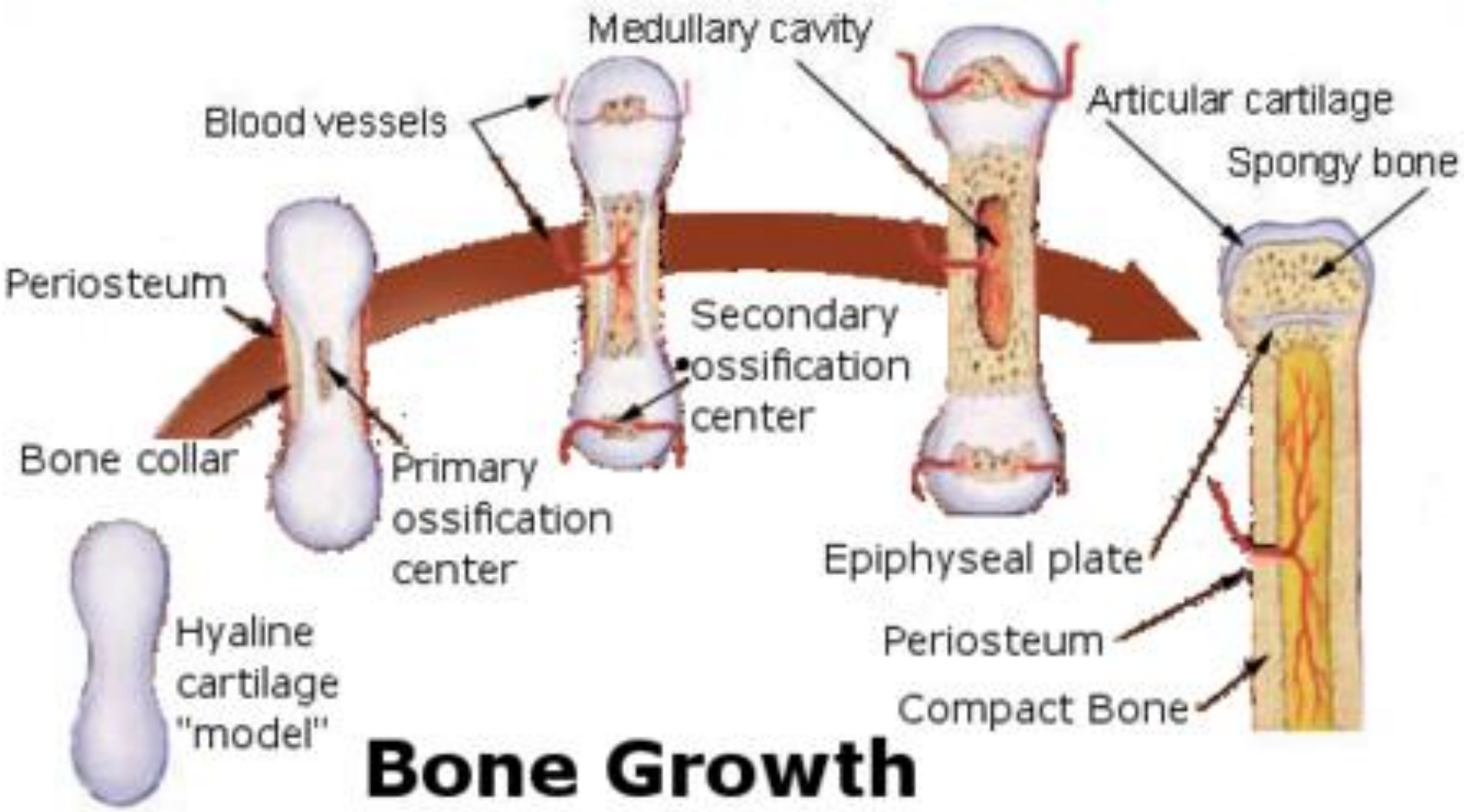




TYPES OF CONNECTIVE TISSUE

1. Cartilage – strong, flexible tissue that makes up soft parts of body.
   Tip of nose, ear
   All bones (from the time of birth) start as cartilage.
   As cartilage hardens, it turns to bone. This process is called ossification.

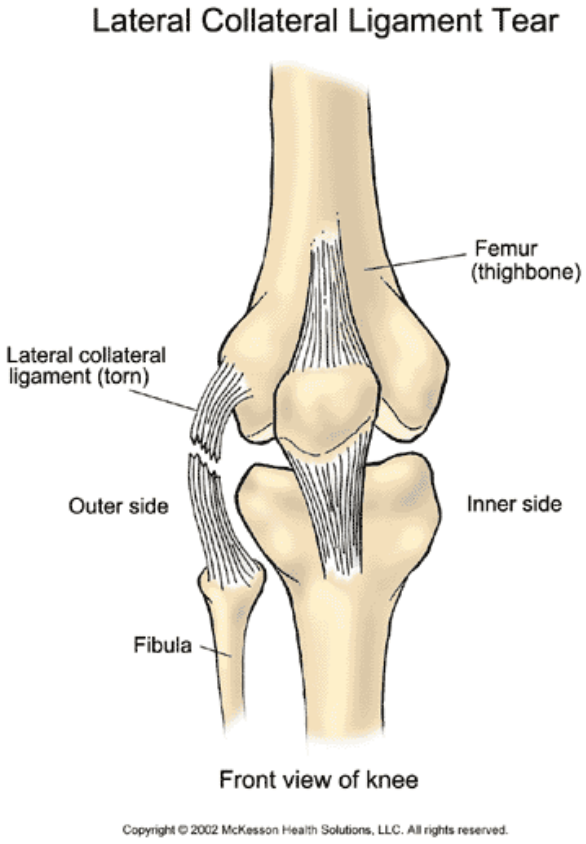

Nasal Bone
Dorsal Hump
Septal Cartilage
Lateral Nasal Cartilage
Greater Alar Cartilage
Alar Fibrofatty Tissue


Medullary cavity
Blood vessels
Articular cartilage
Spongy bone
Periosteum
Secondary ossification center
Bone collar
Primary ossification center
Epiphyseal plate
Periosteum
Compact Bone
Hyaline cartilage "model"

Bone Growth

Types of Connective Tissue

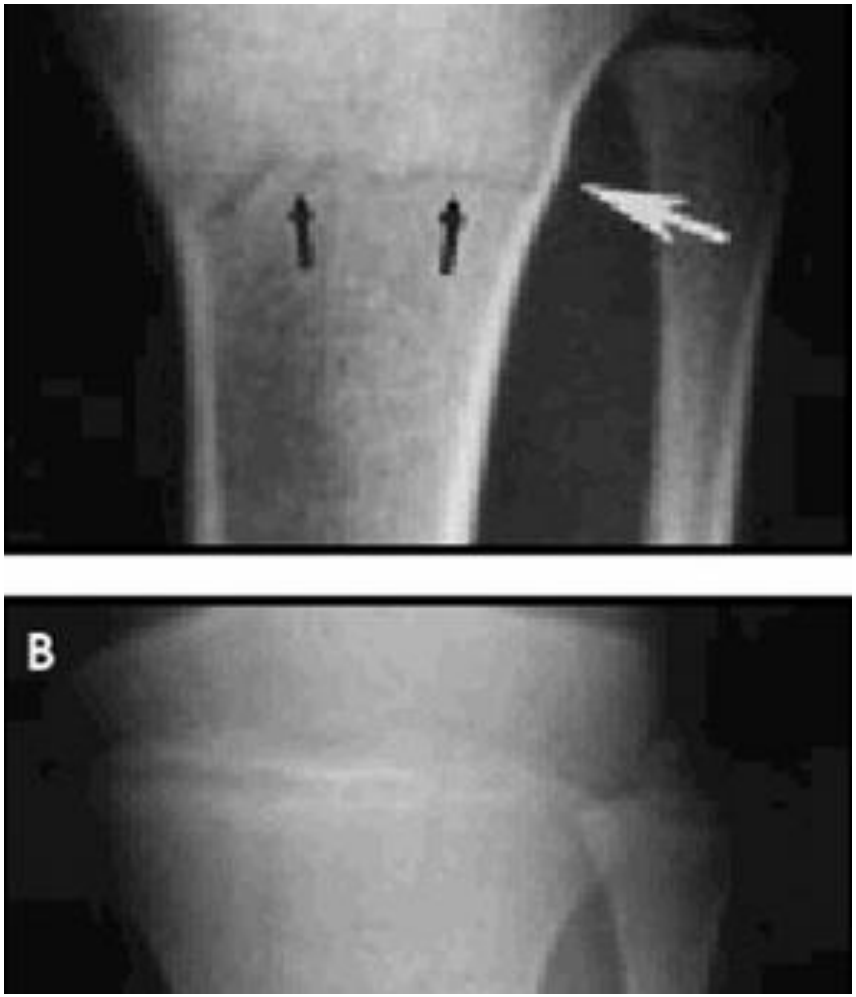
- 2. Ligament – band of fibrous, elastic tissue that connects BONE to BONE!



Types of Connective Tissue

- 3. Tendon – fibrous cord that attaches MUSCLE to BONE!
  - Achilles tendon in back of your foot

Problems of Skeletal System



- Fracture – any type of break in the bone
  - 4 types
  - 1a. Hairline Fracture – parts of the bone do not separate

Problems of Skeletal System

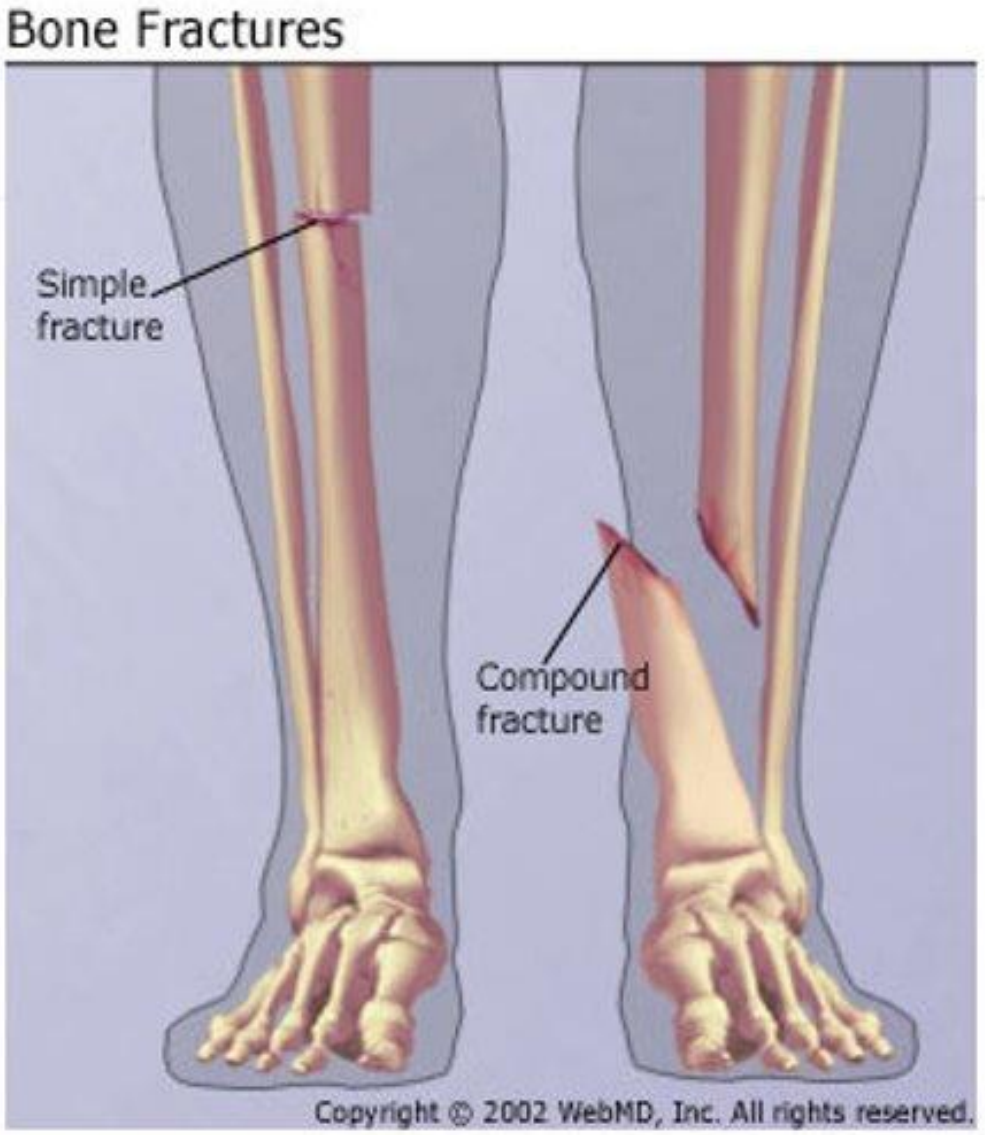
- 1b. Transverse Fracture – when the break is completely across the bone

Problems of Skeletal System

1c. Comminuted Fracture – bone shatters in more than 2 pieces

Types of fractures

1d. Compound Fracture – break in bone punctures the skin



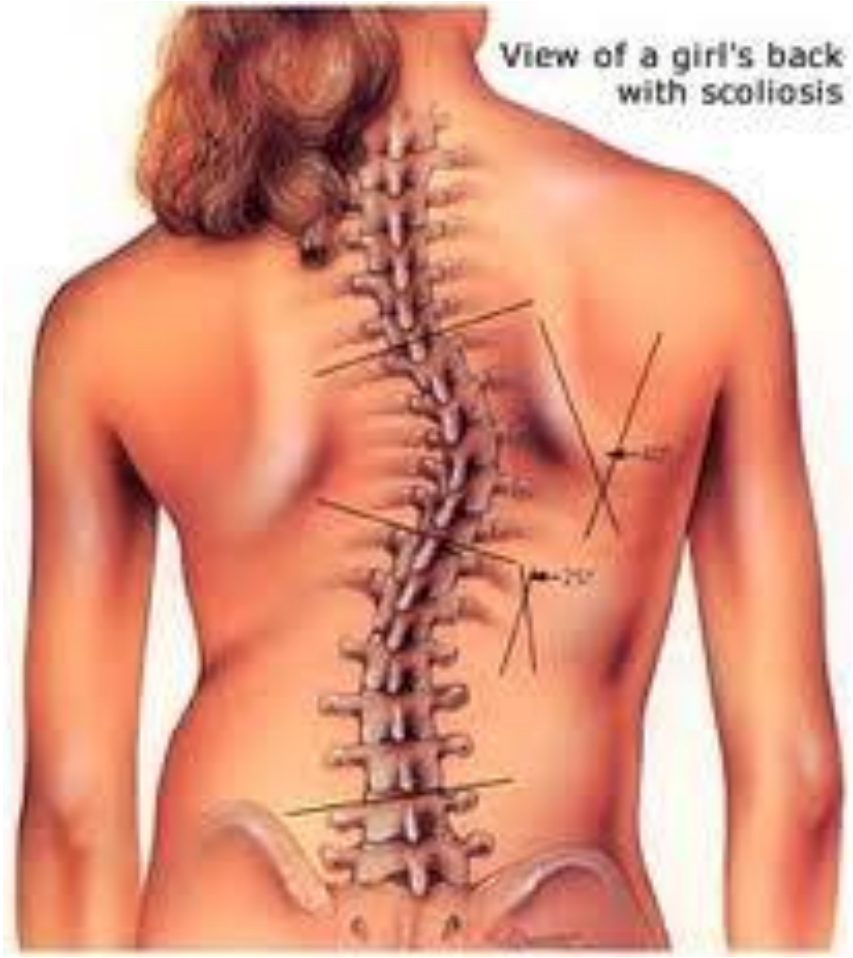
Problems of Skeletal System

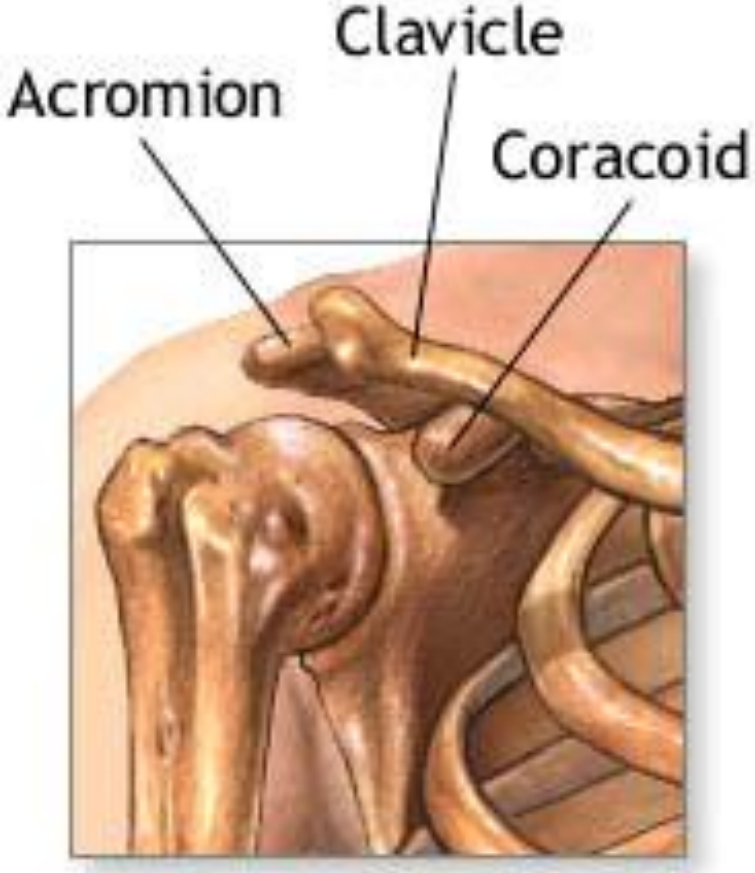
2. Osteoporosis – a condition in which there is a progressive loss of bone tissue

- Bones weaken and become brittle
- Caused by a lack of Vitamin D and calcium
- Milk and other dairy products are excellent sources.
- Weight training and physical activity help increase bone mass

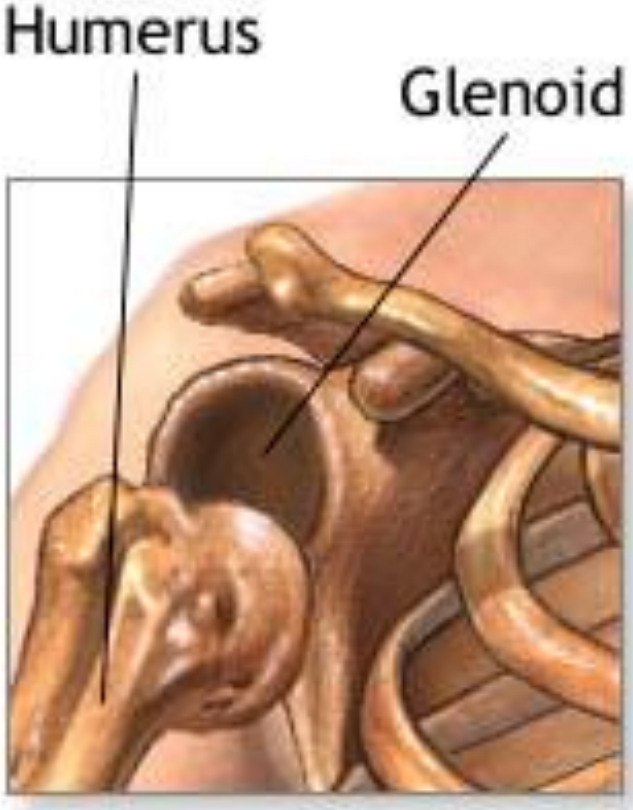
Problems of Skeletal System

3. Scoliosis
   - Lateral, side to side, curvature of the spine.
   - Depending on how serious, can be treated by light exercise, a special brace, or surgery.





Normal anatomy



Dislocated shoulder

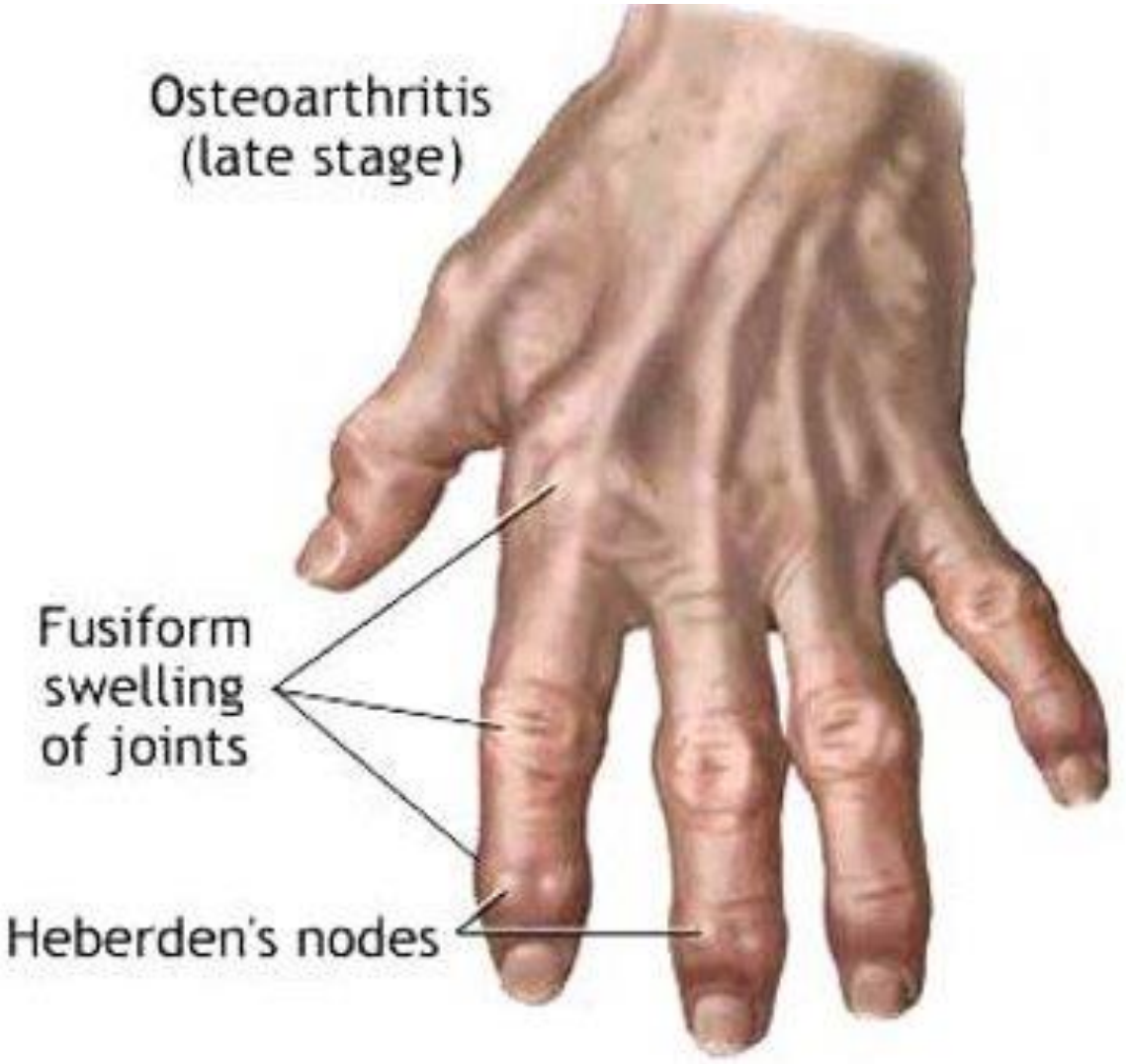
Problems of the Joints

- Dislocation – bone slips out of place, tearing the ligaments that attach bone to bone

Elbow Dislocation

Problems of the Joints

2. Arthritis – inflammation of a joint, resulting from natural wear and tear



Problems of the Joints

3. Carpal tunnel syndrome – ligaments and tendons in the wrist swell, causing numbness, pain, and weakness in the hand.

- Caused by normal wear and tear – typing, writing, etc.

KEEPING THE SKELETAL SYSTEM HEALTHY

Consume Calcium and Vitamin D!

- These are found in dairy products such as milk and yogurt

Participate in regular physical activity

- Light weight-lifting can enhance bone mass.
- Exercise promotes better blood circulation which helps to nourish bones

KEEPING SKELETAL SYSTEM HEALTHY

- Wear protective gear
  - Helmets, pads with contact sports, etc.
- Keep teeth clean!!
  - Infections from cavities can potentially spread to the jaw bone and other facial bones.