

JOINTS

What is a Joint?

Definition:

- ▣ **the point at which two or more bones articulate**

Classifications

- **Structural classification**
 - ▣ **classified by the different tissues that a joint contains**
 - ▣ 3 different categories
 - ▣ **fibrous**
 - ▣ **cartilaginous**
 - ▣ **synovial**
- **Functional Classification**
 - ▣ **classified by the amount of available movement**
 - ▣ synarthrosis - immovable
 - ▣ amphiarthrosis - slightly moveable
 - ▣ diarthrosis - freely moveable

Fibrous Joints

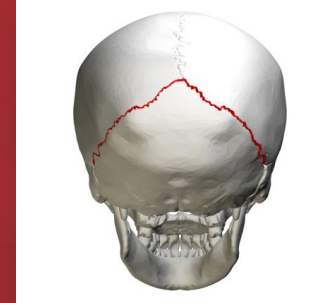
Features:

- ▣ in this type of joint the bones are bound by tough fibrous tissue
- ▣ these joints are made for strength
- ▣ they can be further divided into the following
 - sutures
 - gomphoses
 - syndemoses

Examples of Fibrous Joints

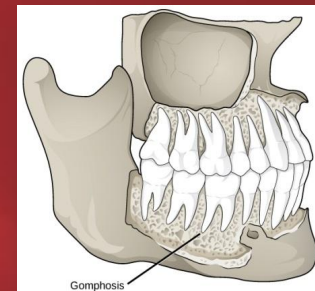
Suture

- ▣ cranial sutures
- ▣ synarthrotic
- ▣ strong for protection



Gomphotic

- ▣ joints that anchor teeth to bony sockets in the upper and lower jaw



Syndesmotic

- ▣ when two bones are joined by a strong membrane or ligament
- ▣ ex: radius & ulna



Cartilaginous Joints

- ▣ the bones in a cartilaginous joint are covered either in hyaline or fibrocartilage
- ▣ cartilage is a very thick gel and is an excellent shock absorber
- ▣ two main types of cartilaginous joints:
 - synchondroses – (primary)
 - ▣ involve only hyaline cartilage
 - ▣ can be synarthrotic or amphiarthrotic
 - ▣ example: the joint between the diaphysis and the epiphysis of a growing long bone, between the manubrium & sternum
 - symphyses – (secondary)
 - ▣ can involve hyaline or fibrocartilage
 - ▣ these joints are amphiarthrosis
 - ▣ example: the pubic symphysis

Examples of Cartilaginous Joints

(a) Synchondroses

Bones united by hyaline cartilage



Epiphyseal plate (temporary hyaline cartilage joint)

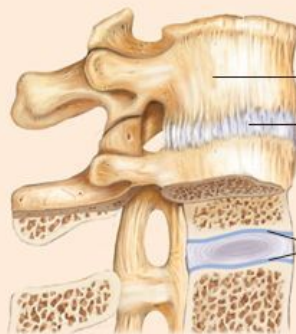


Sternum (manubrium)

Joint between first rib and sternum (immovable)

(b) Symphyses

Bones united by fibrocartilage



Body of vertebra

Fibrocartilaginous intervertebral disc

Hyaline cartilage



Pubic symphysis

Synovial Joints

Synovial joints have:

- ▣ articular cartilage
 - smooth lining of cartilage on each end of the bone making up the joint
- ▣ joint capsule
 - strong covering made of connective tissue
- ▣ synovial fluid
 - aka: joint fluid - fluid within the joint utilized to reduce friction during movement

Synovial joints are:

- ▣ fully moveable joints (diarthrotic)
- ▣ classified by the movement that occurs at the joint

Types of Synovial Joints

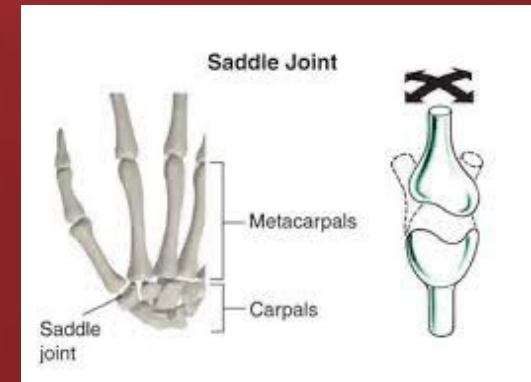
▣ Hinge

- allow joints to move in one direction, back and forth, have limited motion in limited planes
- flexion & extension
- ex: elbow joint



▣ Saddle

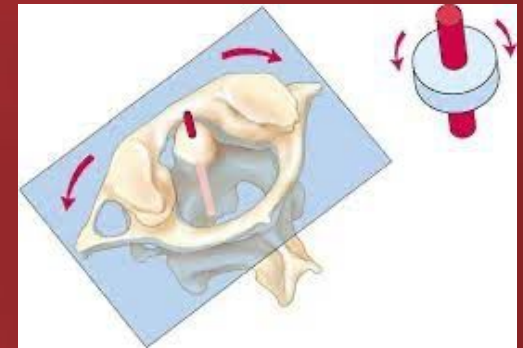
- when concave and convex surfaces unite
- flexion & extension, abduction & adduction
- ex: carpometacarpal joint of the thumb



Types of Synovial Joints ct'd

▣ Pivot

- a freely moveable joint that allows for rotary motion
- ex: atlantoaxial joint between atlas & axis



▣ Plane/Gliding

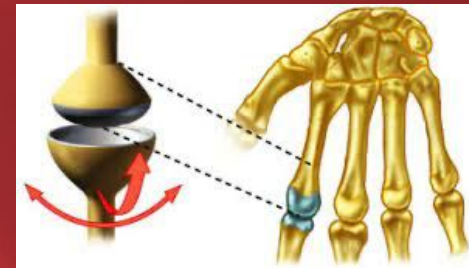
- when articulating surfaces between bones are flat
- allows for gliding/sliding motions
- ex: acromioclavicular joint in the shoulder



Types of Synovial Joints ct'd

▣ Condylloid/Ellipsoid

- when a rounded end fits into a similarly shaped cavity
- allows for flexion & extension, abduction & adduction, & circumduction
- ex: metacarpophalangeal joint



▣ Ball & Socket

- when a ball shaped end of one bone fits into a a cup-like depression of another bone
- permits movement in several axis
- ex: glenohumeral joint



Joint Names

- ▣ Joints are named based on the articulation between the bones

Here are some examples:

- ▣ Temporomandibular (TMJ):
 - temporal bone & mandible
- ▣ Tibiofemoral:
 - tibia & femur
- ▣ Metacarpophalangeal:
 - metacarpal bone & phalanx
- ▣ Glenohumeral:
 - glenoid cavity & humerus

Joints: Crash Course Anatomy & Physiology #20