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

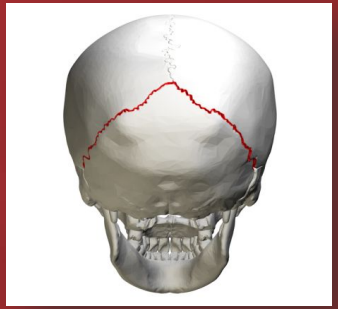
Features:

- 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

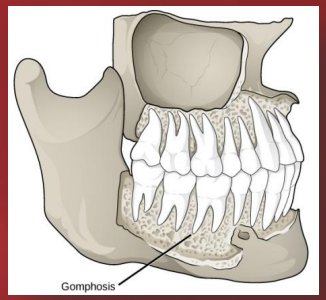
Suture

- cranial sutures
- synarthrotic
- strong for protection



Gomphotic

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



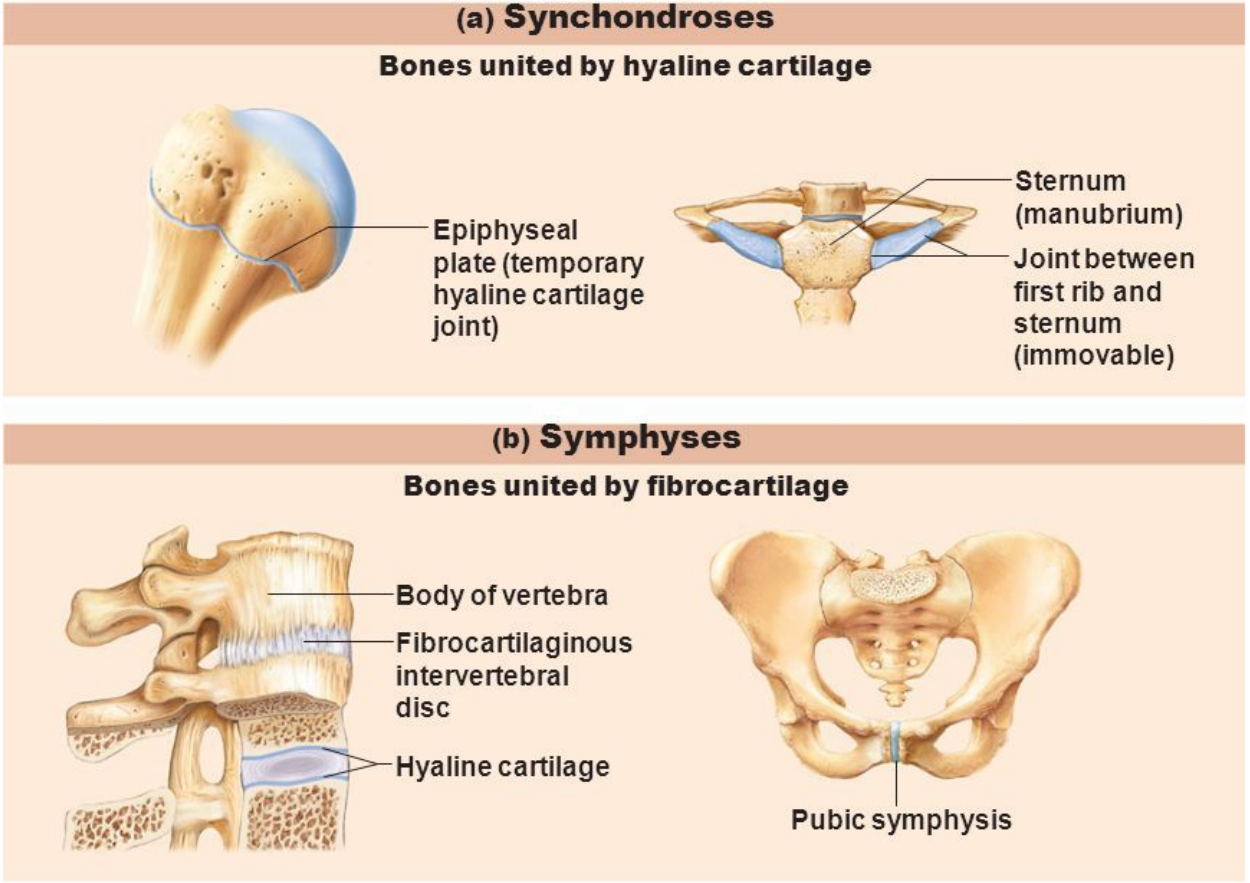
Syndesmotic

- 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 amphairthrosis
      - example: the pubic symphsis

Examples of Cartilaginous Joints



Synovial Joints

Synovial joints have:

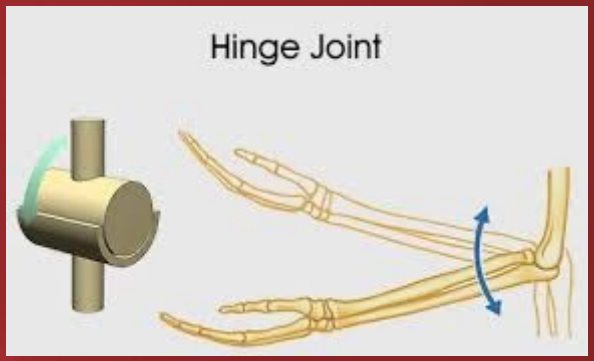
- articular cartilage
  - smooth lining of cartilage on each end of the bone making up the joint
- joint capsule
  - strong covering made of connective tissue
- synovial fluid
  - aka: joint fluid - fluid within the joint utilized to reduce friction during movement

Synovial joints are:

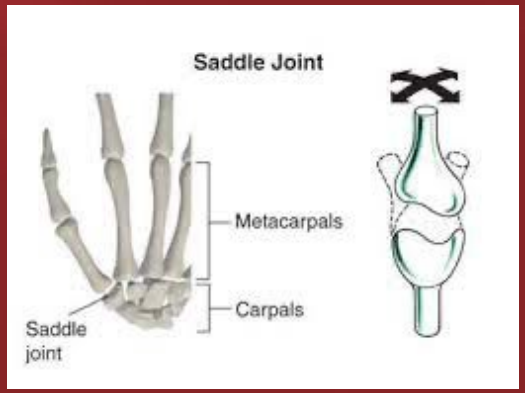
- fully moveable joints (diathrotic)
- classified by the movement that occurs at the joint

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

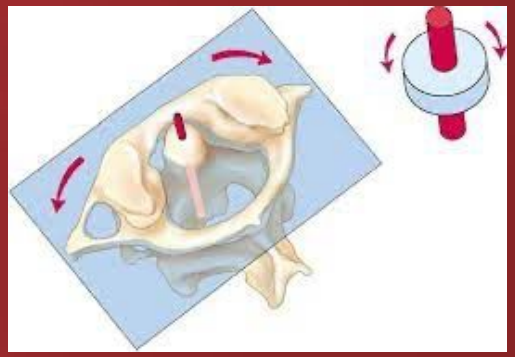


- Saddle
  - when concave and convex surfaces unite
  - flexion & extension, abduction & adduction
  - ex: carpometacarpal joint of the thumb



Types of Synovial Joints ct'd

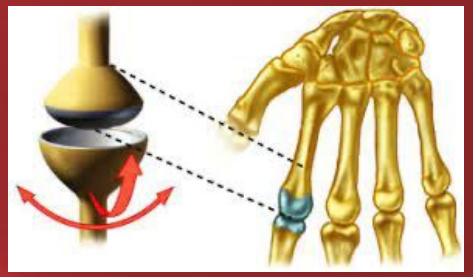
- Pivot
  - a freely moveable joint that allows for rotary motion
  - ex: atlantoaxial joint between atlas & axis



- 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

- Condyloid/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