

# Articulations

## Chapter 9

### Introduction

- **Skeleton composition**
  - Many bones joined together (articulated)
- **Articulation**
  - Joints
- **Advantages and disadvantages of strong vs. weak joints**

### Functional Classification

- **Synarthroses** – immovable
- **Amphiarthroses** – slightly moveable
- **Diarthroses** – freely moveable

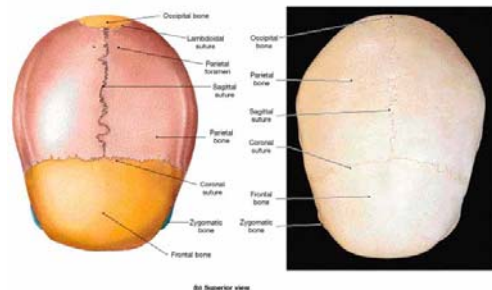
### Structural Classification

- **Fibrous joints**
  - Lack joint cavity
  - Held together by fibrous connective tissue
  - Synarthritic or amphiarthritic
- **Cartilaginous joints**
  - Lack joint cavity
  - Held together by cartilage
  - Synarthritic or amphiarthritic
- **Synovial joints**
  - Joint cavity present
  - Held together by ligaments
  - Diarthritic

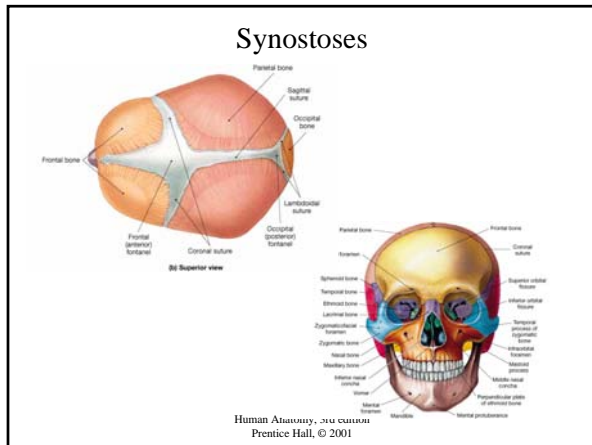
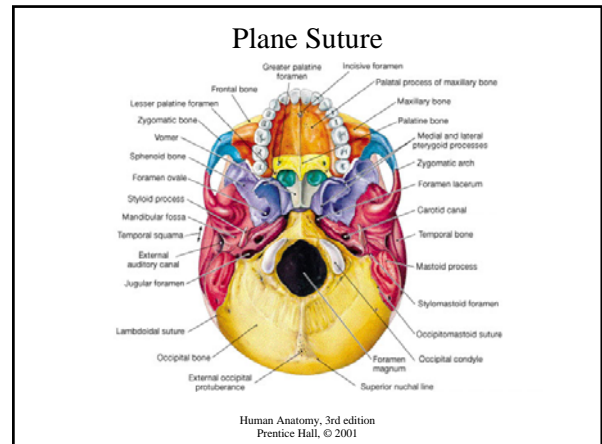
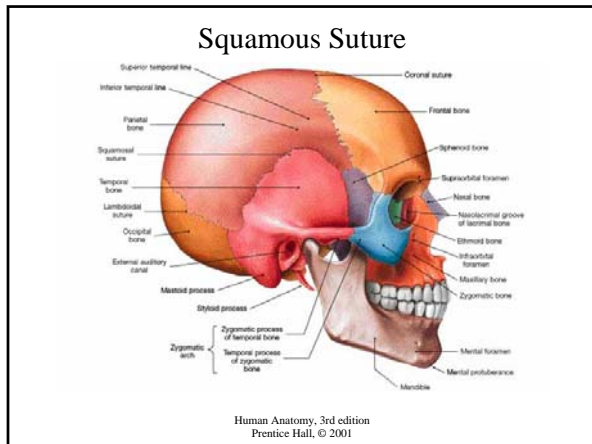
### Synarthroses

- **Sutures** – found between skull bones
  - Held together by dense fibrous connective tissue
- **Types**
  - **Serrate**
  - **Squamous**
  - **Plane**
  - **Synostoses**

### Serrate Suture





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### More Synarthroses

- **Symphondroses**
  - Held together by hyaline cartilage
  - May form synostoses

(a) (b)

### More Synarthroses

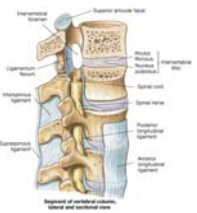
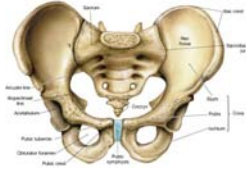
- **Gomphosis**
  - Held together by ligaments
  - Cone-shaped pet fits into a socket

(a) Tooth, sectional view

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### Amphiarthroses

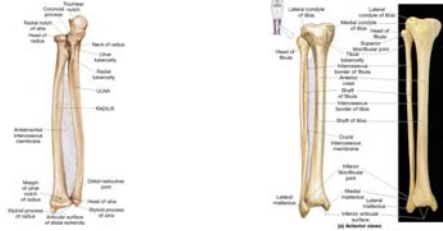
- **Symphyses**
  - Held together by fibrocartilage

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## More Amphiarthroses

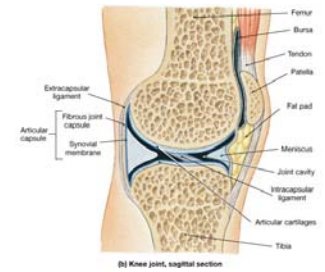
- **Syndesmoses**
  - Held together by collagen fibers



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## Diarthroses – Synovial Joints

- Most common joints
- Characteristics
  - **Joint cavity**
  - Articular cartilage
  - **Articular capsule**
    - Fibrous layer
    - **Synovial membrane** secretes **synovial fluid**
  - **Accessory ligaments**
  - **Menisci**
  - **Bursae**



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## Movements at Synovial Joints

- Limitations
- Types of movements
  - **Gliding**
    - Back & forth, side to side
    - Surfaces are flat
  - **Angular**
    - Increase or decrease angles between bones

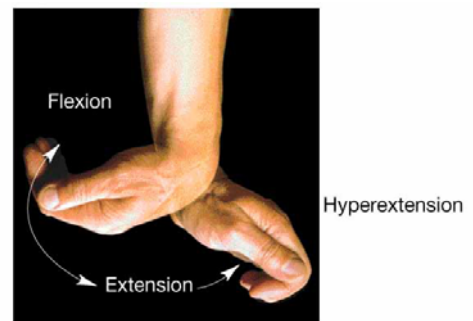
## Types of Angular Movements

## Flexion & Extension

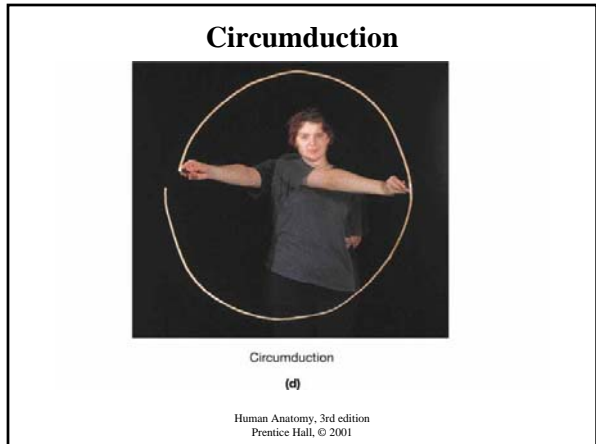
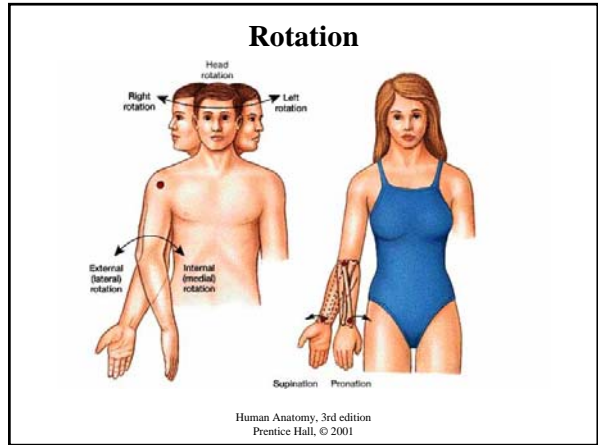
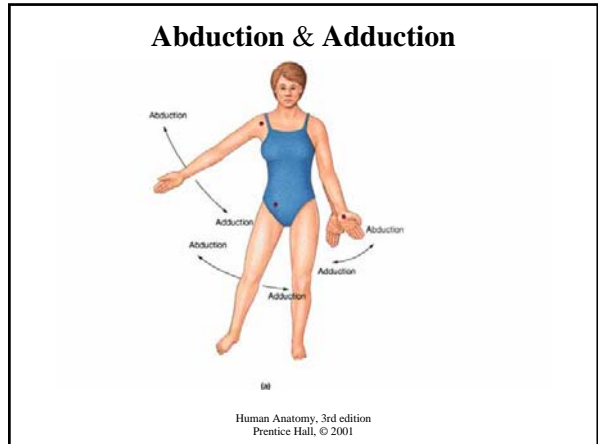
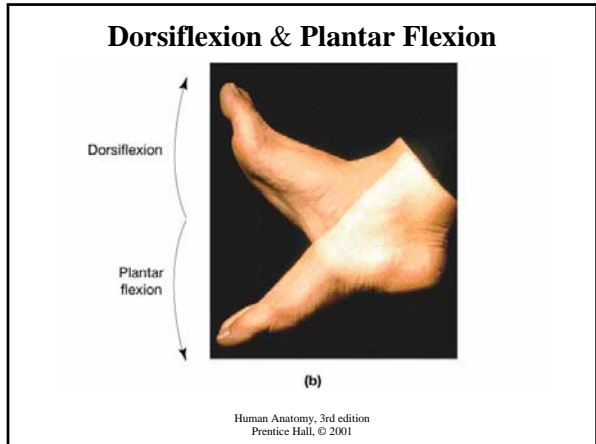


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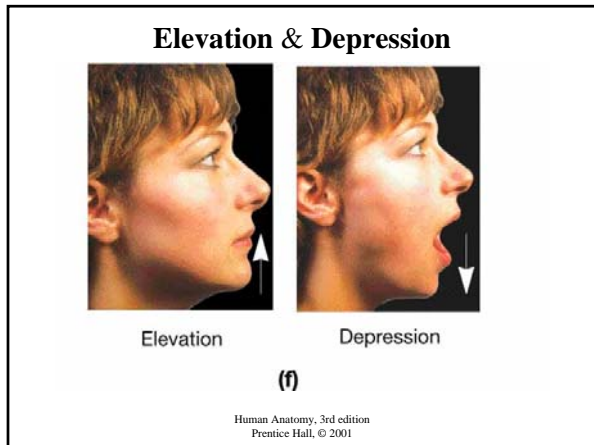
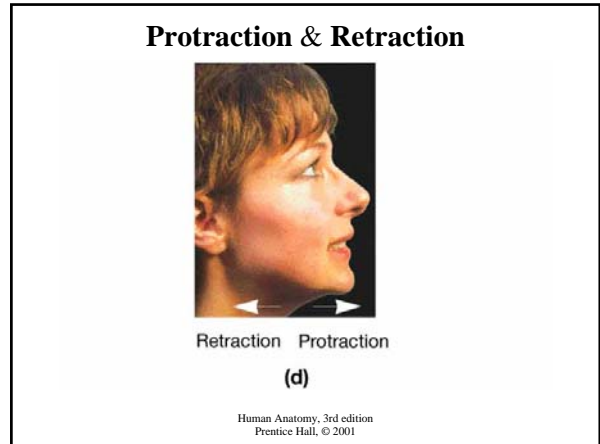
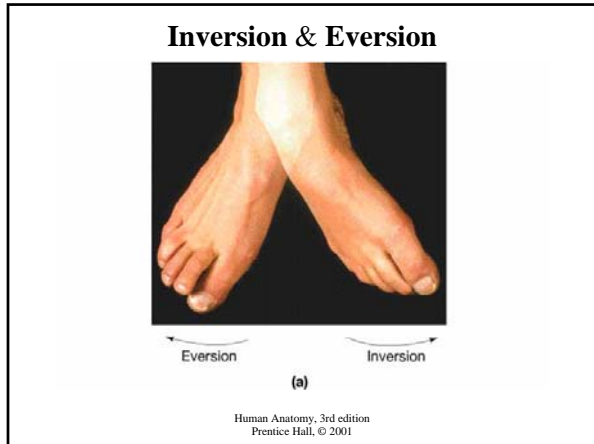
## Flexion & Extension



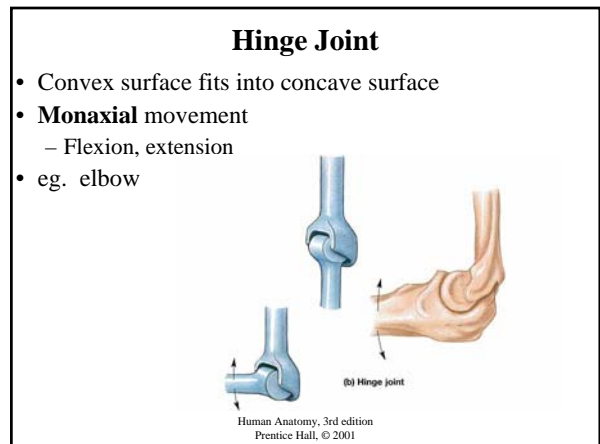
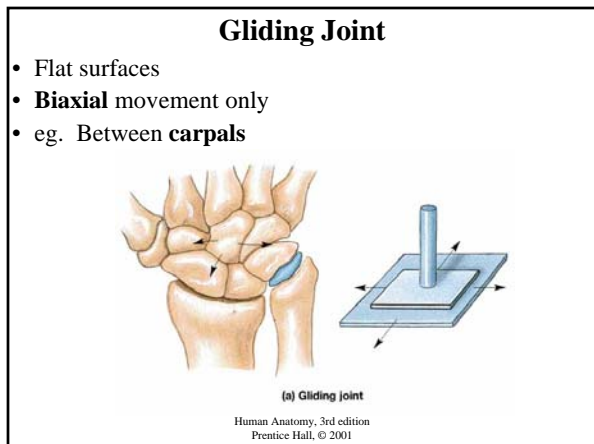
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## Special Types of Angular Movements

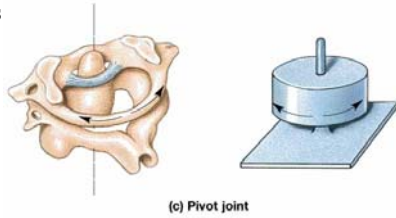


## Subtypes of Synovial Joints



### Pivot Joint

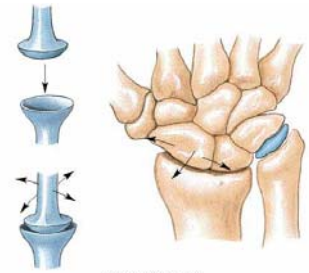
- Rounded surface articulates within a ring
- Monaxial movement
  - Rotation
- eg. between **atlas**



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### Ellipsoidal Joint

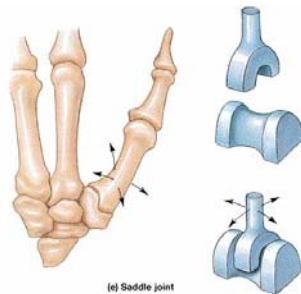
- Oval-shaped condyle fits into elliptical cavity
- Biaxial movement
- eg. between **radius** & carpals



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### Saddle Joint

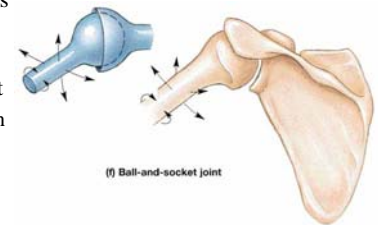
- Articular surfaces of both bones are concave in one direction and convex in the other
- biaxial movement
- eg. Between 1<sup>st</sup> **metacarpal** of thumb & **trapezium**



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### Ball and Socket Joint

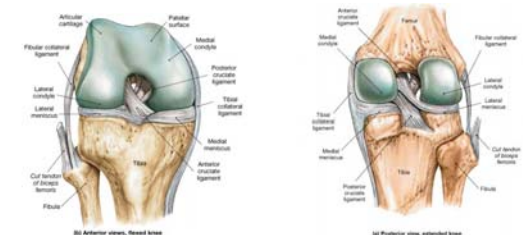
- Ball-like surface fits into cuplike depression
- **Triaxial** movement
  - Flexion, extension
  - Abduction, adduction
  - Rotation
- eg. shoulder



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### Anatomy of the Knee

- Joint between **femur** & **tibia**
- Hinge joint but looks like ellipsoidal joint
- Four ligaments hold it together
- Menisci and bursae are present



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### Disorders

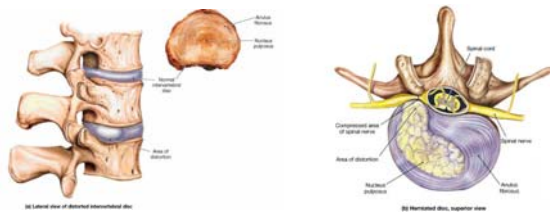
## Dislocation

<http://www.sportsmed.buffalo.edu/info/fingerdis.html>

## Bursitis

<http://www.healthopedia.com/pictures/bursitis.html>

## Slipped Disc



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## Arthritis

- **Arthritis** – inflammation of joints
  - Osteoarthritis
  - Rheumatoid arthritis
  - Gouty arthritis

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## Gouty Arthritis

<http://healthgate.partners.org/browsing/LearningCenter.asp?fileName=11825.xml&title=Gout>

## Osteoarthritis

[http://www.abc.net.au/health/library/osteoarthritis\\_ff.htm](http://www.abc.net.au/health/library/osteoarthritis_ff.htm)

## Rheumatoid Arthritis

<http://arthritis.upmc.com/RheumatoidArthritis/Overview.htm>