

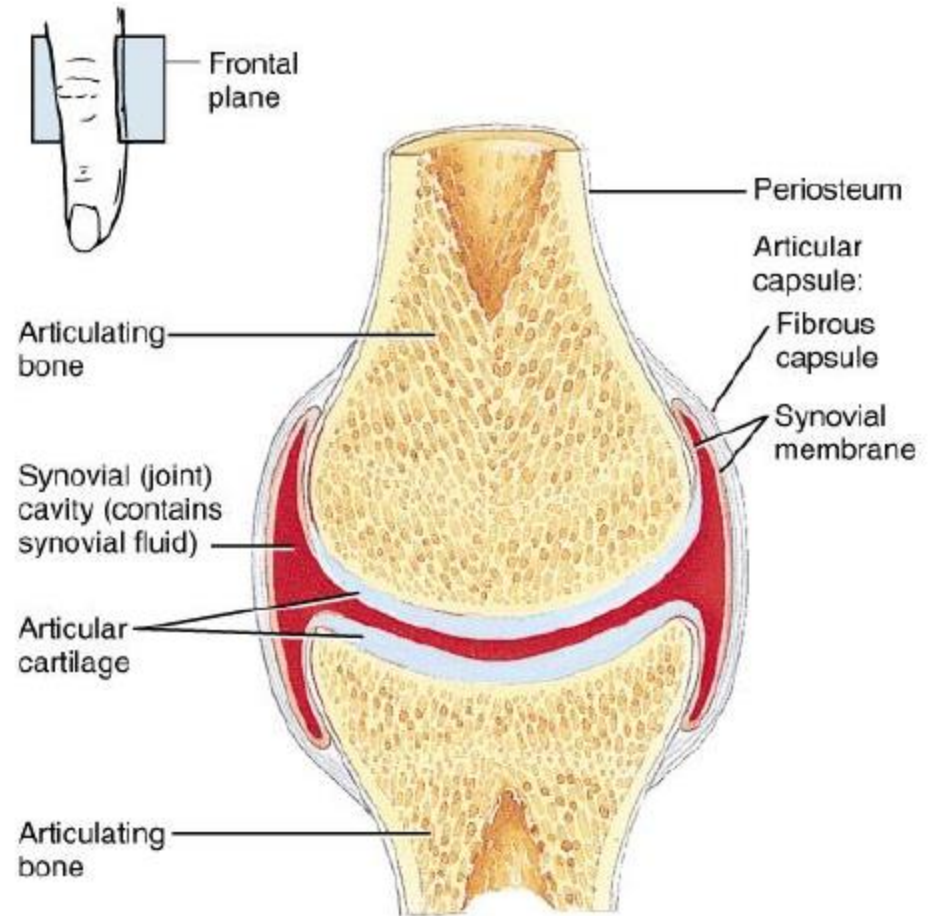
JOINTS (1)

Dr. Hanan Al-Lataifeh

Joints



- Joints hold bones together but permit movement
- Point of contact
 - ▣ between 2 bones
 - ▣ between cartilage and bone
 - ▣ between teeth and bones
- Arthrology = study of joints
- Kinesiology = study of motion



Classification of Joints

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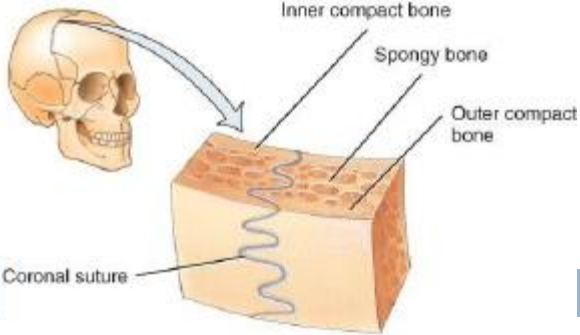
- Structural classification is based on the presence or absence of a *synovial* (joint) *cavity* and type of connecting tissue. Structurally, joints are classified as
 - *fibrous, cartilaginous, or synovial.*

- Functional classification based upon movement:
 - immovable = synarthrosis
 - slightly movable = amphiarthrosis
 - freely movable = diarthrosis

Structural classification of joints

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1. *Fibrous*
2. *Cartilaginous*
3. *Synovial*



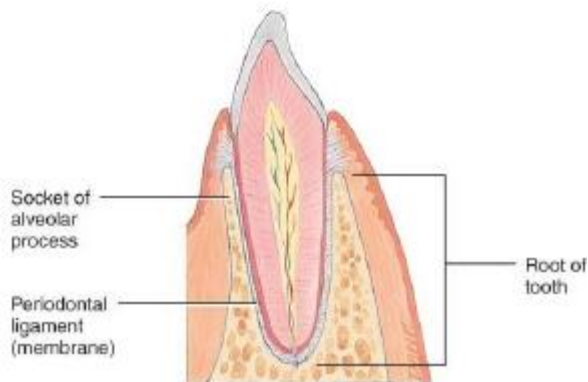
(a) Suture between skull bones

Fibrous Joints

- Lack a synovial cavity
- Bones held closely together by fibrous connective tissue
- Little or no movement (synarthroses or amphiarthroses)
- 3 structural types
 - ▣ sutures
 - ▣ syndesmoses
 - ▣ gomphoses



(b) Syndesmoses between tibia and fibula



(c) Gomphosis between tooth and socket of alveolar process

Fibrous Joints

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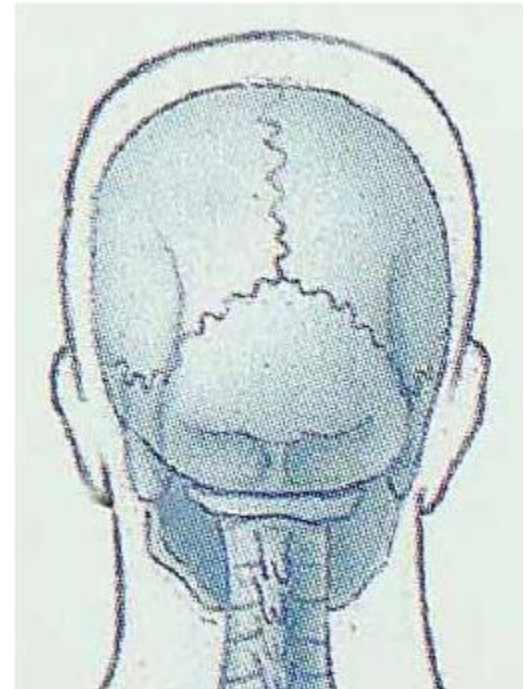
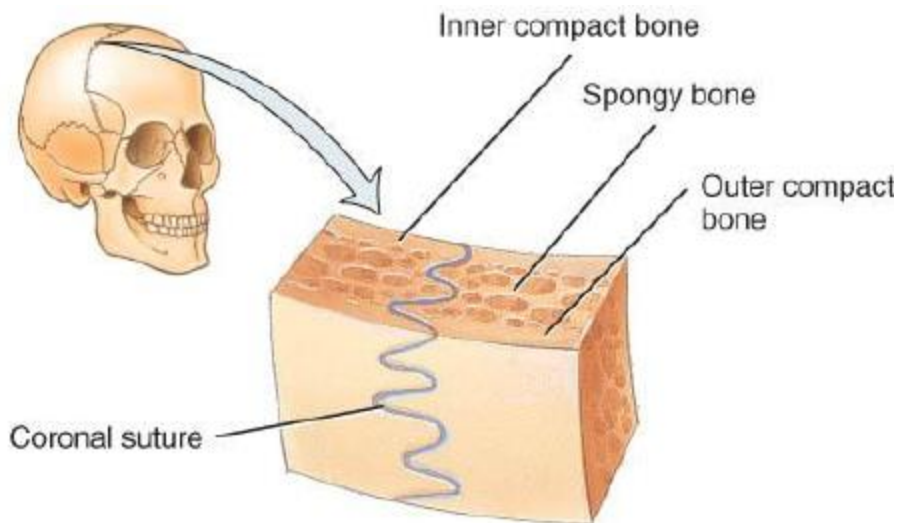
1. **sutures**

2. **syndesmoses**

3. **gomphoses**

Sutures

- Thin layer of dense fibrous connective tissue unites bones of the skull
- Immovable (synarthrosis)



Fibrous Joints

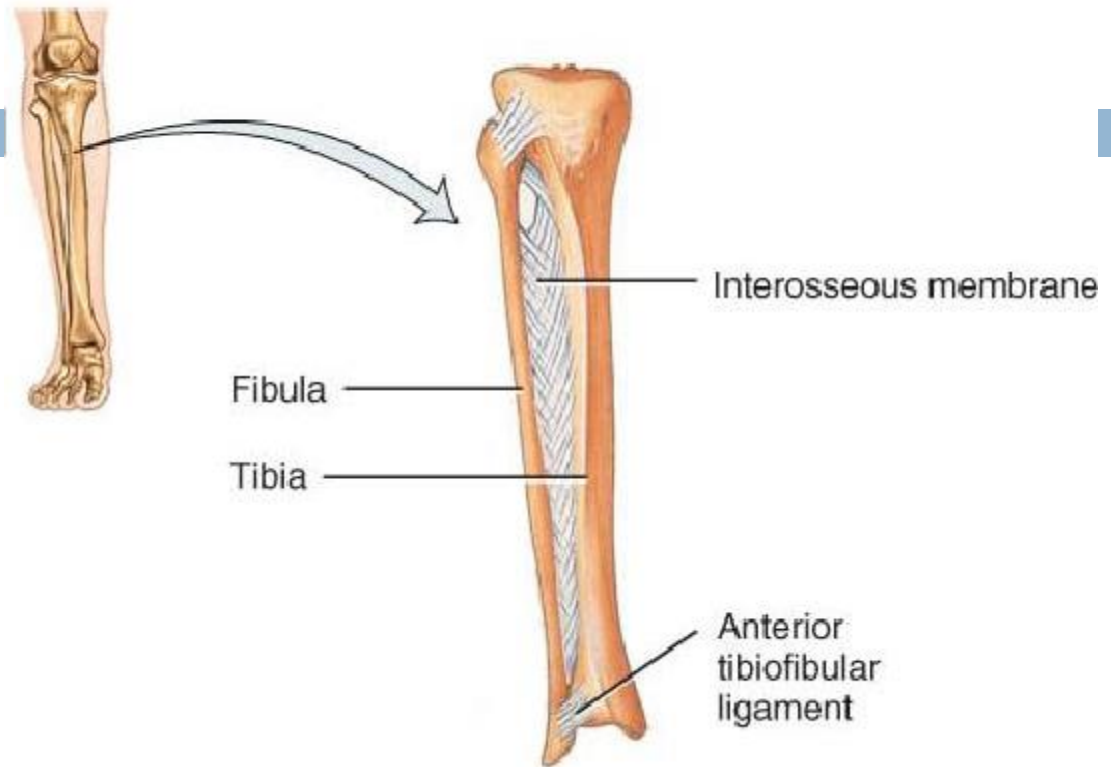
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1. sutures

2. syndesmoses

3. gomphoses

Syndesmosis



- Fibrous joint
 - ▣ bones united by ligament
- Slightly movable (amphiarthrosis)
- Anterior tibiofibular joint and Interosseous membrane

Fibrous Joints

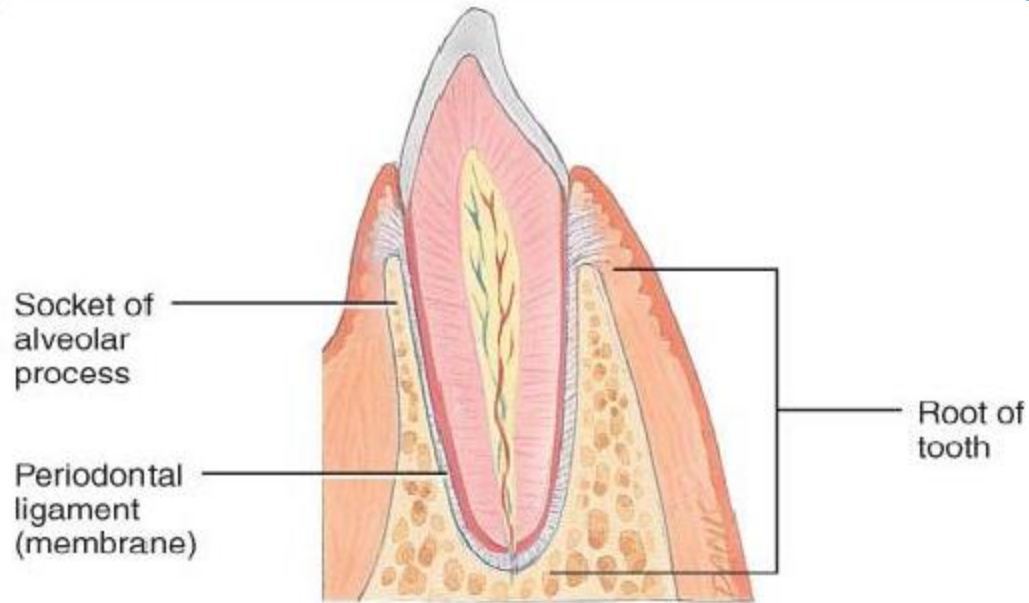
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1. sutures

2. syndesmoses

3. gomphoses

Gomphosis



(c) Gomphosis between tooth and socket of alveolar process

- Fibrous joint
- Immovable
- Teeth in alveolar processes

Structural classification of joints

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1. *Fibrous*

2. *Cartilaginous*

3. *Synovial*

Cartilaginous Joints

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- Lacks a synovial cavity
- Allows little or no movement
- Bones tightly connected by fibrocartilage or hyaline cartilage
- 2 types
 - ▣ synchondroses
 - ▣ symphyses

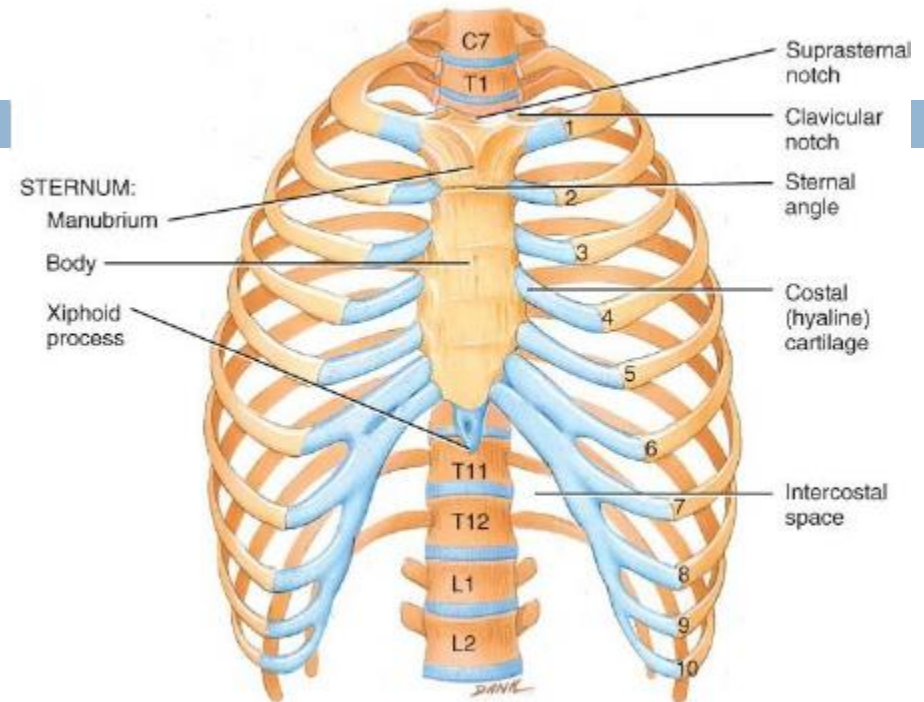
Cartilaginous Joints

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1. **synchondroses**

2. **symphyses**

Synchondrosis



- Connecting material is hyaline cartilage
- Immovable (synarthrosis)
- Joints between ribs and sternum

Cartilaginous Joints

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1. **synchondroses**

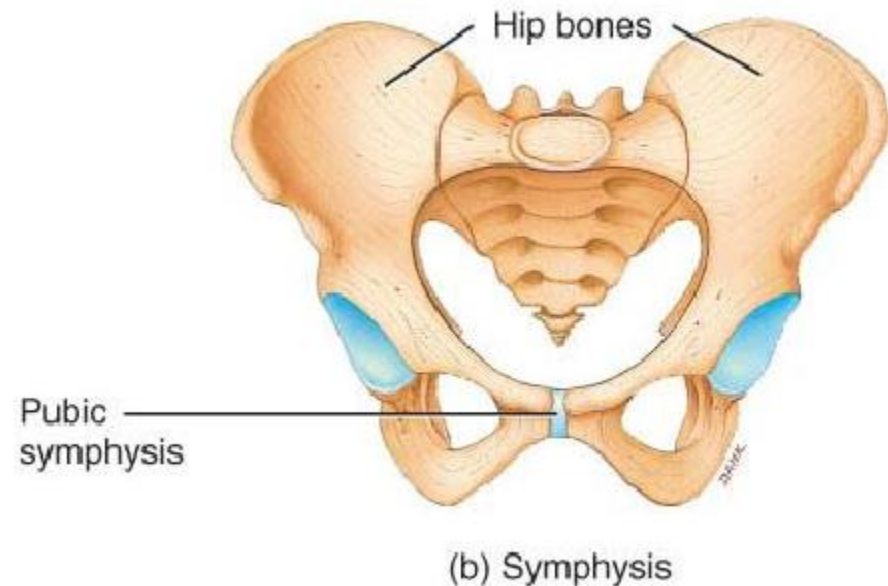
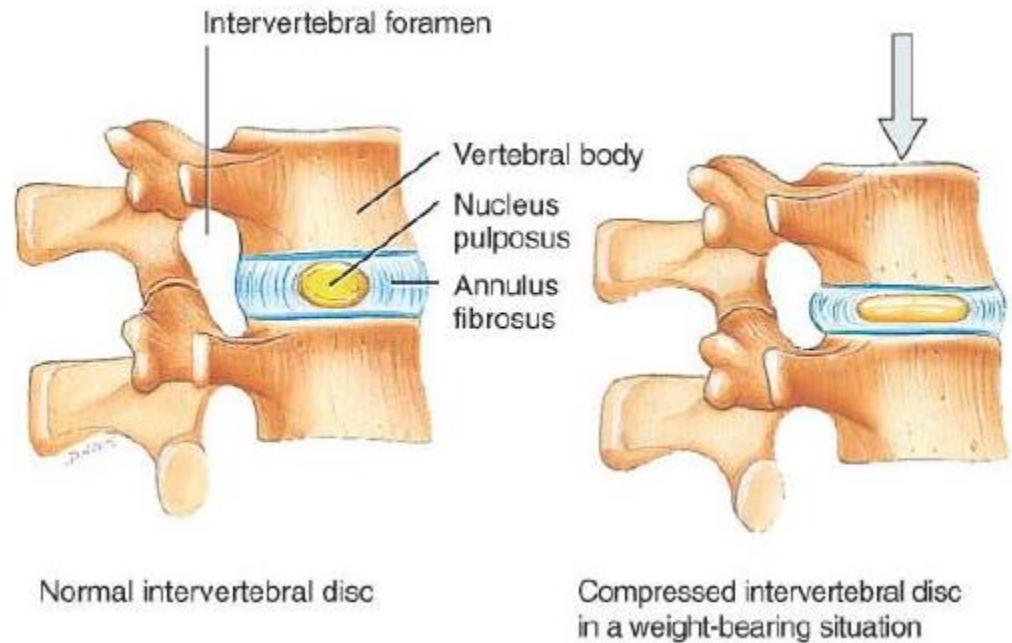
2. **symphyses**

Symphysis

- Fibrocartilage is connecting material
- Slightly movable (amphiarthroses)

Example:

- Intervertebral discs
- pubic symphysis



Structural classification

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1. *Fibrous*

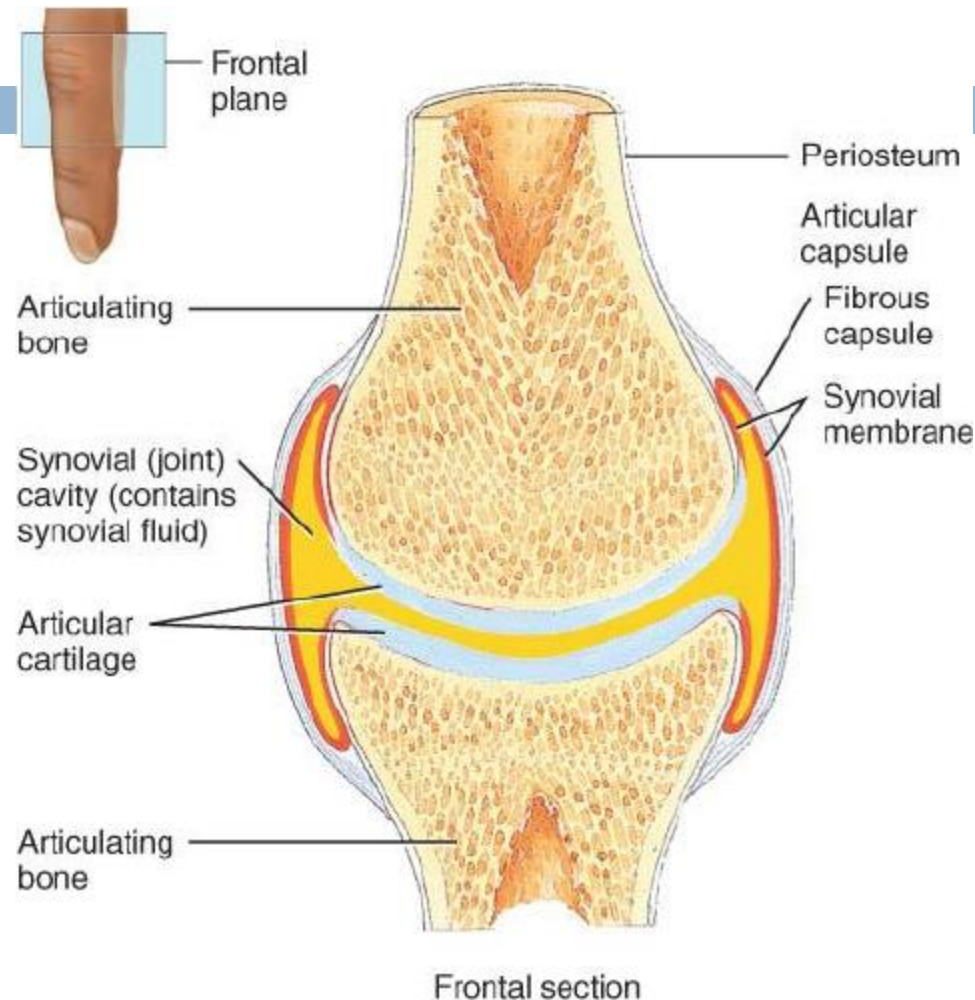
2. *Cartilaginous*

3. *Synovial*

Synovial Joints

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- ❑ Synovial cavity separates articulating bones
- ❑ Freely moveable (diarthroses)
- ❑ Synovial joints consist of:
 1. **Articular cartilage covering ends of bones**
 - ❑ reduces friction
 - ❑ absorbs shock
 2. **Articular capsule**
 - ❑ surrounds joint
 - ❑ thickenings in fibrous capsule called ligaments
 3. **Synovial membrane**
 - ❑ inner lining of capsule



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TYPES OF MOVEMENT AT SYNOVIAL JOINTS

Gliding Movements

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- *Gliding* movements occur when relatively flat bone surfaces move back and forth and from side to side with respect to one another
- In gliding joints there is no significant alteration of the angle between the bones.

Gliding motion consists of side-to-side and back-and-forth movements.



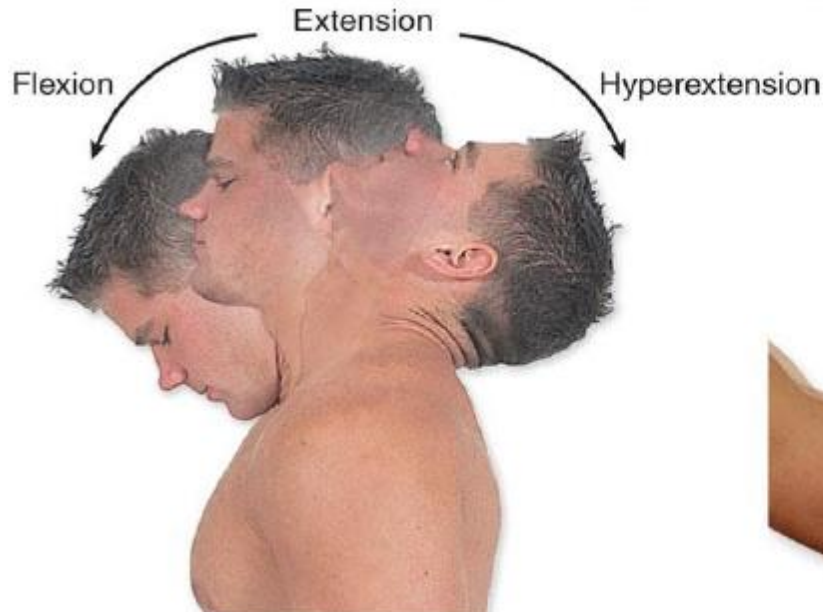
Gliding between intercarpals (arrows)

Angular Movements

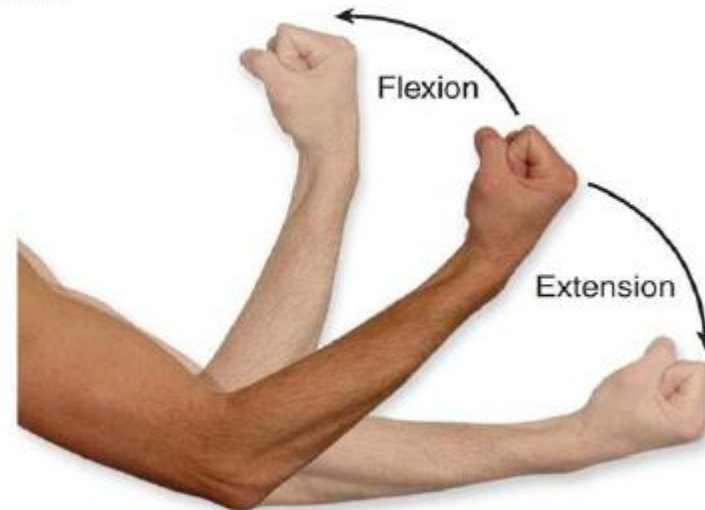
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- In *angular movements* there is an increase or a decrease in the angle between articulating bones.
 - **Flexion** results in a decrease in the angle between articulating bones
 - **Extension** results in an increase in the angle between articulating bones
 - **Hyperextension** is a continuation of extension beyond the anatomical position.

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(a)



(b)

Abduction and Adduction

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- **Abduction** refers to the movement of a bone away from the midline .
- **Adduction** refers to the movement of a bone toward the midline.

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(a)



(c)

Circumduction

- Movement of a distal end of a body part in a circle
- Combination of flexion, extension, adduction and abduction

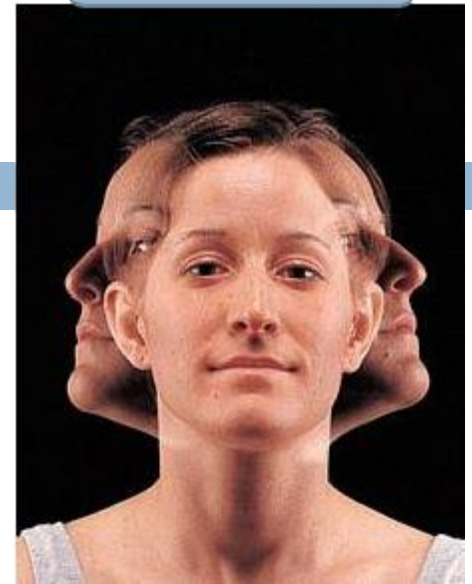
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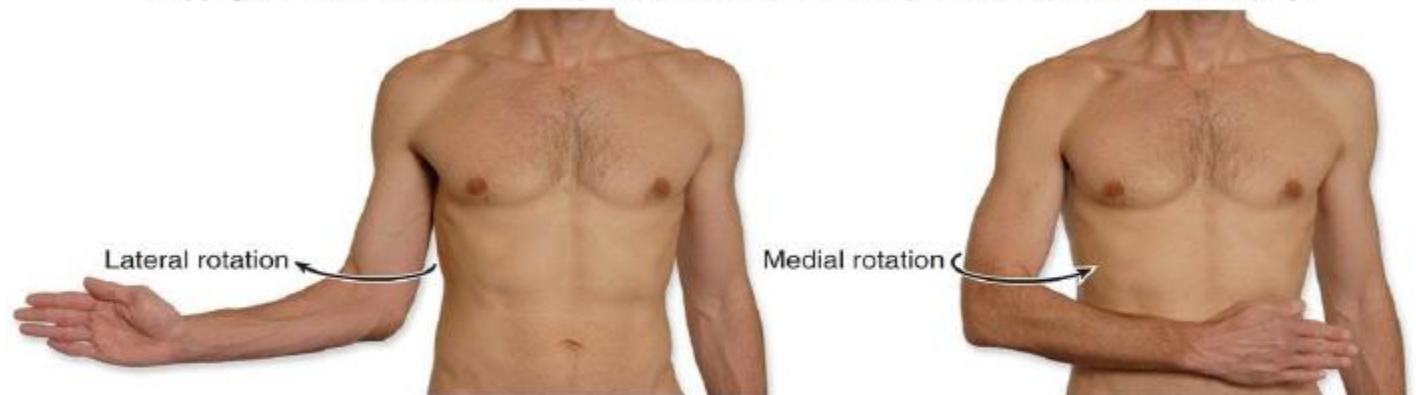
Rotation

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- Bone revolves around its own longitudinal axis
 - ▣ medial rotation is turning of anterior surface in towards the midline
 - ▣ lateral rotation is turning of anterior surface away from the midline



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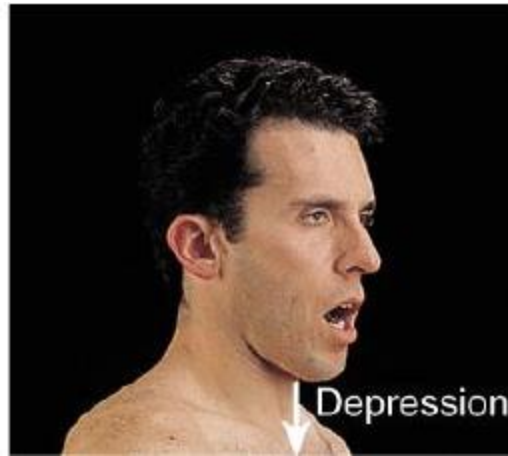
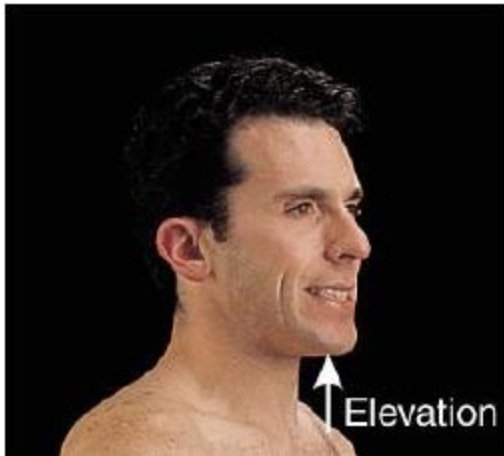
(b)

Special Movements

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- *Elevation* is an upward movement of a part of the body .
- *Depression* is a downward movement of a part of the body .

Special Movements of Mandible

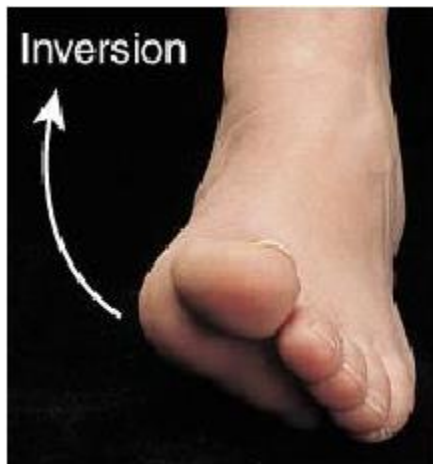


- Elevation = upward
- Depression = downward

Special foot Movements

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- *Inversion* is movement of the soles medially at the intertarsal joints so that they face away from each other .
- *Eversion* is a movement of the soles laterally at the intertarsal joints so that they face away from each other .



Special Foot Movements

- *Dorsiflexion* refers to bending of the foot at the ankle in the direction of the superior surface .
- *Plantar flexion* involves bending of the foot at the ankle joint in the direction of the plantar surface



Special Movements

- **Supination** is a movement of the forearm at the proximal and distal radioulnar joints in which the palm is turned anteriorly or superiorly.
- **Pronation** is a movement of the forearm at the proximal and distal radioulnar joints in which the distal end of the radius crosses over the distal end of the ulna and the palm is turned posteriorly or inferiorly.



Pronation

(d)



Supination

Special Movements

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- *Opposition* is the movement of the thumb at the carpometacarpal joint in which the thumb moves across the palm to touch the tips of the finger on the same hand.

