

# Joints

**Dr. Priti Acharya**

# Joints

- Joint is a junction between two or more bone or cartilage
- It is a device that permits movements

# Classification of Joints

## **A. Structural Classification**

### 1. Fibrous joints

- Sutures -e.g ( intranasal suture, interparietal suture)
- Syndesmosis- bone are connected by interosseous ligaments e.g (inferior tibiofibular joint)
- Gomphosis- e.g (root of the teeth in bony sockets)

## 2. Cartilaginous joints

- Primary cartilaginous joints or synchondrosis- e.g (Joint between epiphysis and diaphysis, costochondral joints)
- Secondary cartilaginous joints or symphysis- e.g (symphysis pubic , intervertebral joints )

### 3.Synovial Joints

- Ball and socket joints
- Saddle joints
- Condylar joints
- Ellipsoid joints
- Hinge joints
- Pivot joints
- Plane joints

## **B. Functional Classification**

- Synarthrosis (immovable ) like fibrous joints  
e.g Suture of skull
- Amphiarthrosis (slightly movable)like cartilaginous joints  
e.g intervertebral disc
- Diarthrosis (freely movable) like synovial joints

## **C. Regional Classification**

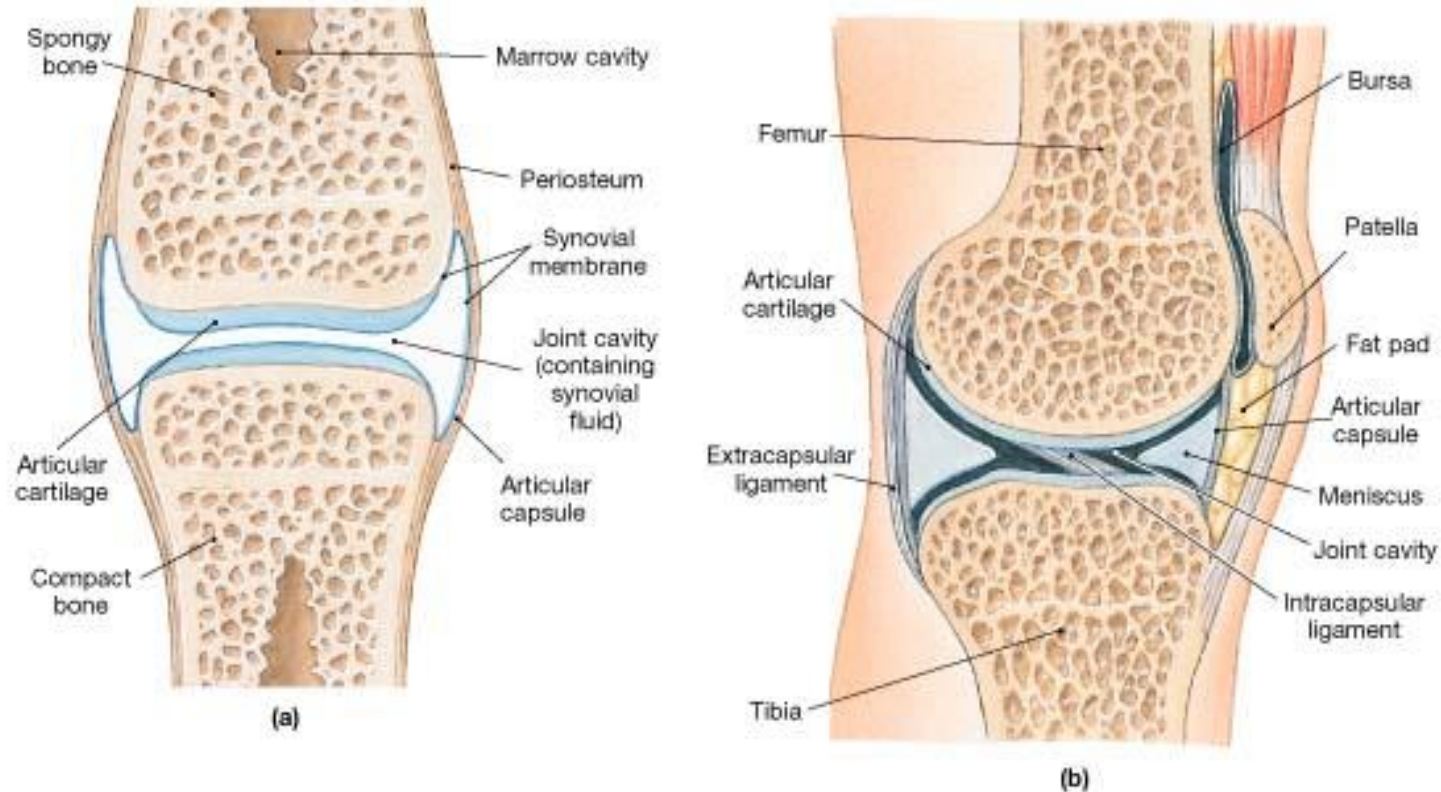
1. Skull type-immovable
2. Vertebral type-slightly immovable
3. Limb type- freely movable

## **D. According to number of articulating bone**

1. Simple joint-When two bone articulate. e.g (interphalangeal joint)
2. Compound joint-When more than two bone articulate within one capsule. e.g (elbow joint, wrist joint)
3. Complex joint-When joint cavity is divided by two articular disc e.g (temporomandibular joint, sternoclavicular joints)



# SYNOVIAL JOINTS

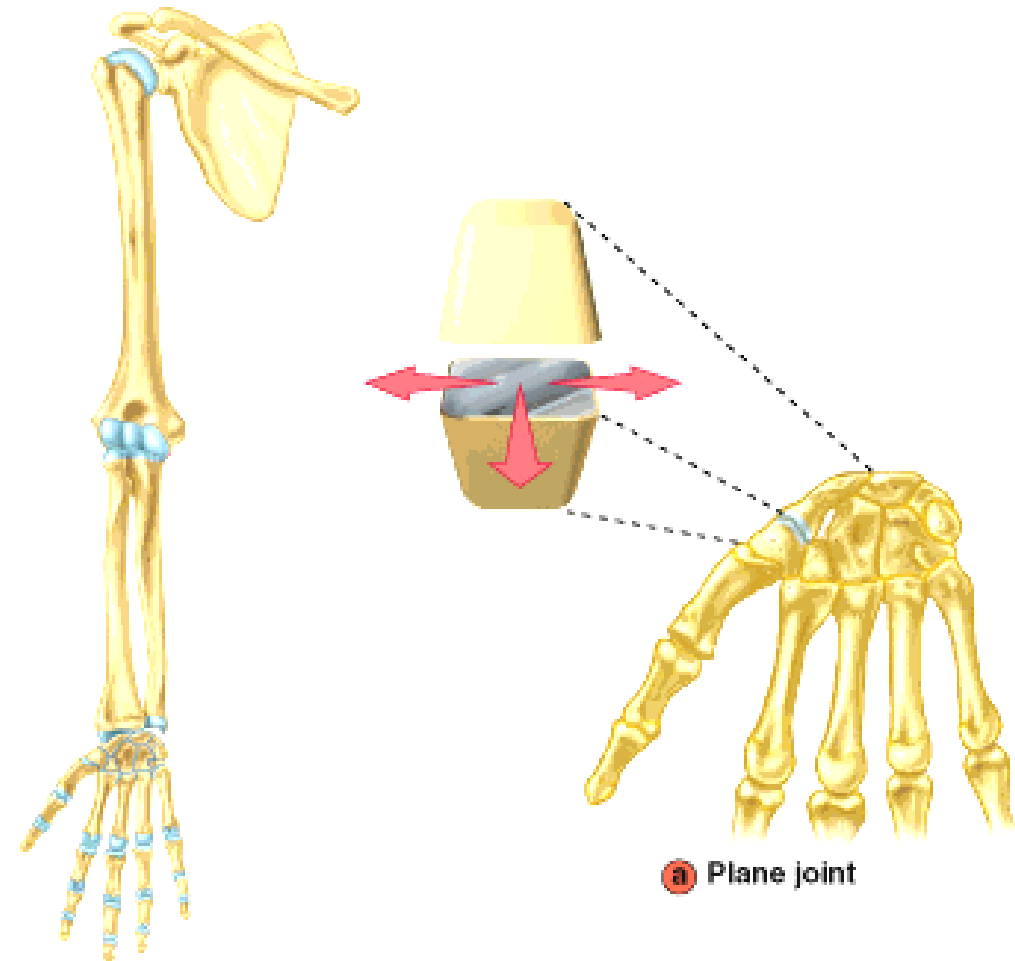


• **FIGURE 9-1** The Structure of a Synovial Joint. (a) Diagrammatic view of a simple articulation. (b) A simplified sectional view of the knee joint.

| Types of Joint         | Type of movement   | Example   |
|------------------------|--|---|
| Ball and socket joints | Flexion and Extension, Abduction and Adduction, Circumduction and Rotation | Shoulder joints, Hip joints                           |
| Saddle joints          | Flexion and Extension, Abduction and Adduction                             | Sternoclavicular joints, first carpometacarpal joints |
| Condylar joints        | Flexion, Extension and limited rotation                                    | Knee joints, Temporomandibular joints                 |

| Types of Joint   | Type of movement  | Examples   |
|------------------|---|--|
| Hinge joints     | Flexion and Extension   | Elbow joints, Ankle joints, Interphalangeal joints             |
| Ellipsoid joints | Flexion and Extension, Abduction and Adduction, Circumduction | Wrist joints, Metacarpophalangeal joints                       |
| Pivot joints     | Rotation only   | Superior and inferior radio-ulnar joints, atlanto-axial joints |
| Plane joints     | Gliding movement  | Intercarpal joints, Intertarsal joints, cirothyroid joints     |

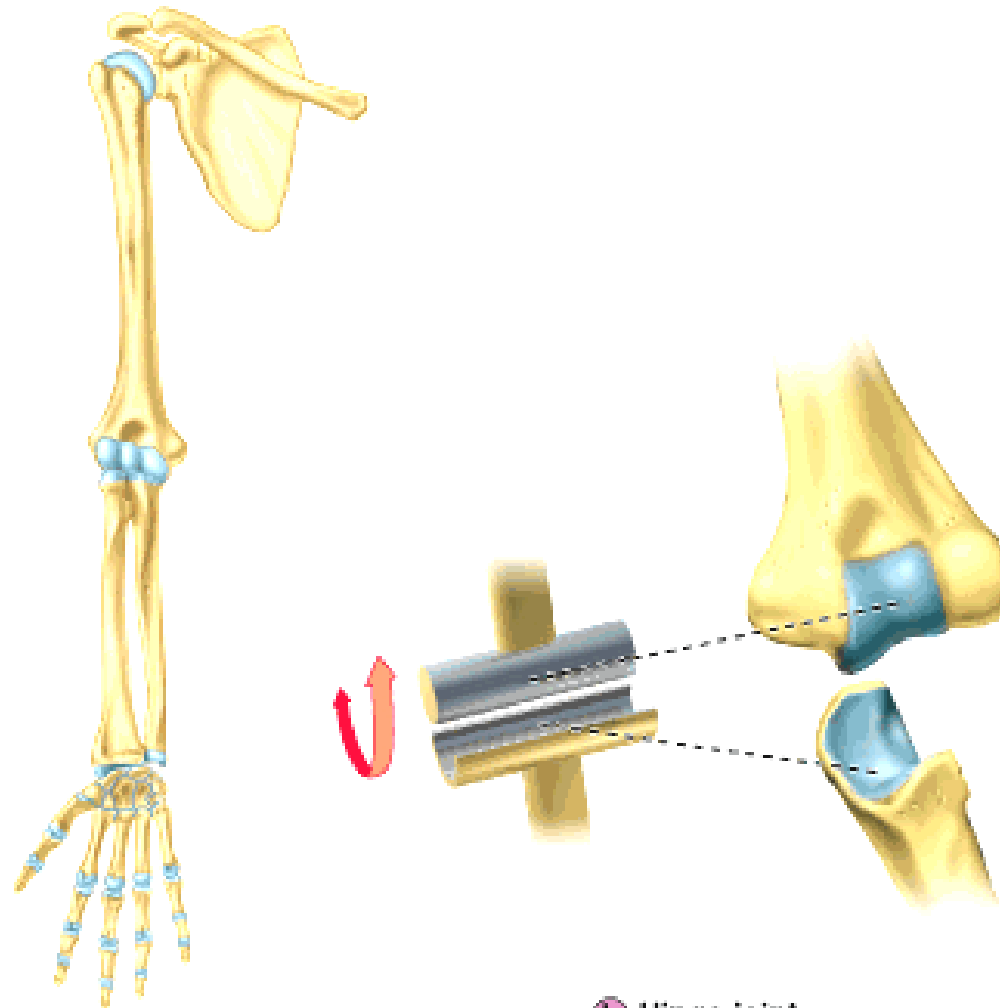
# Inter carpal joints



**a** Plane joint

- Nonaxial
- Uniaxial
- Biaxial
- Multiaxial

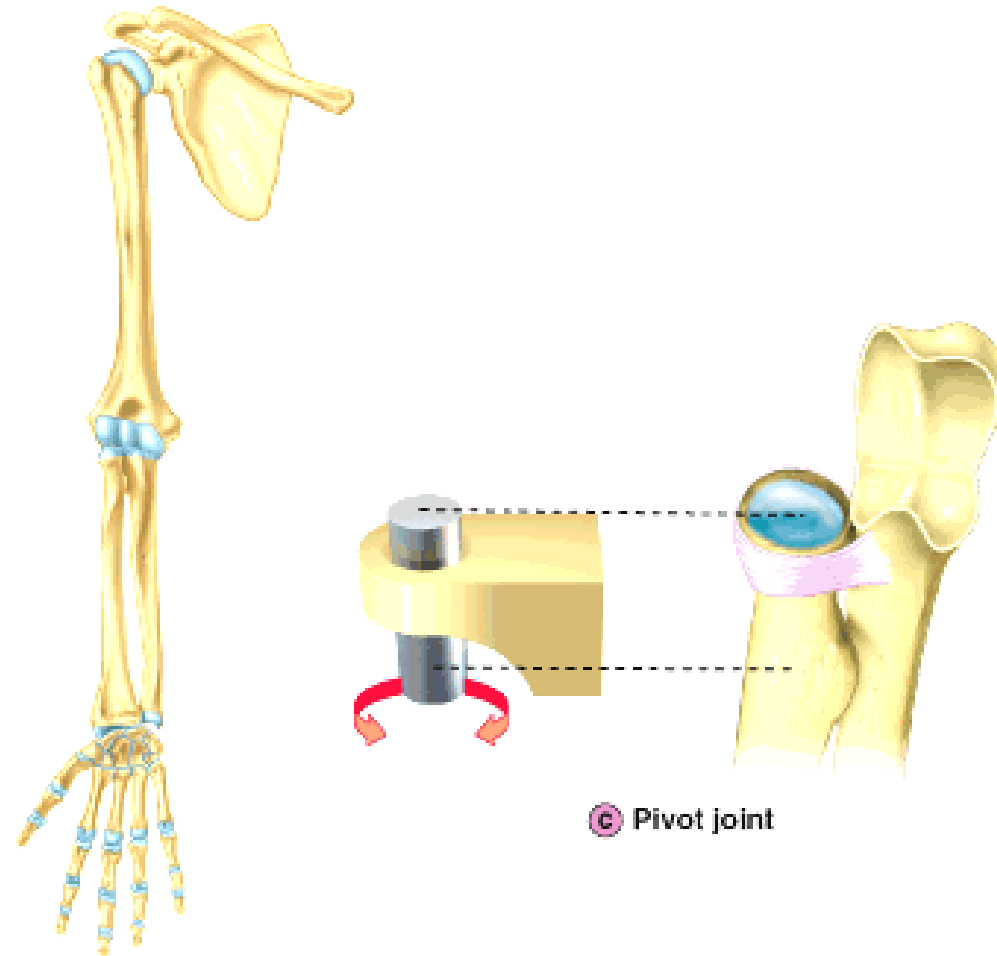
# Elbow joint



**(b)** Hinge joint

- Nonaxial
- Uniaxial
- Biaxial
- Multiaxial

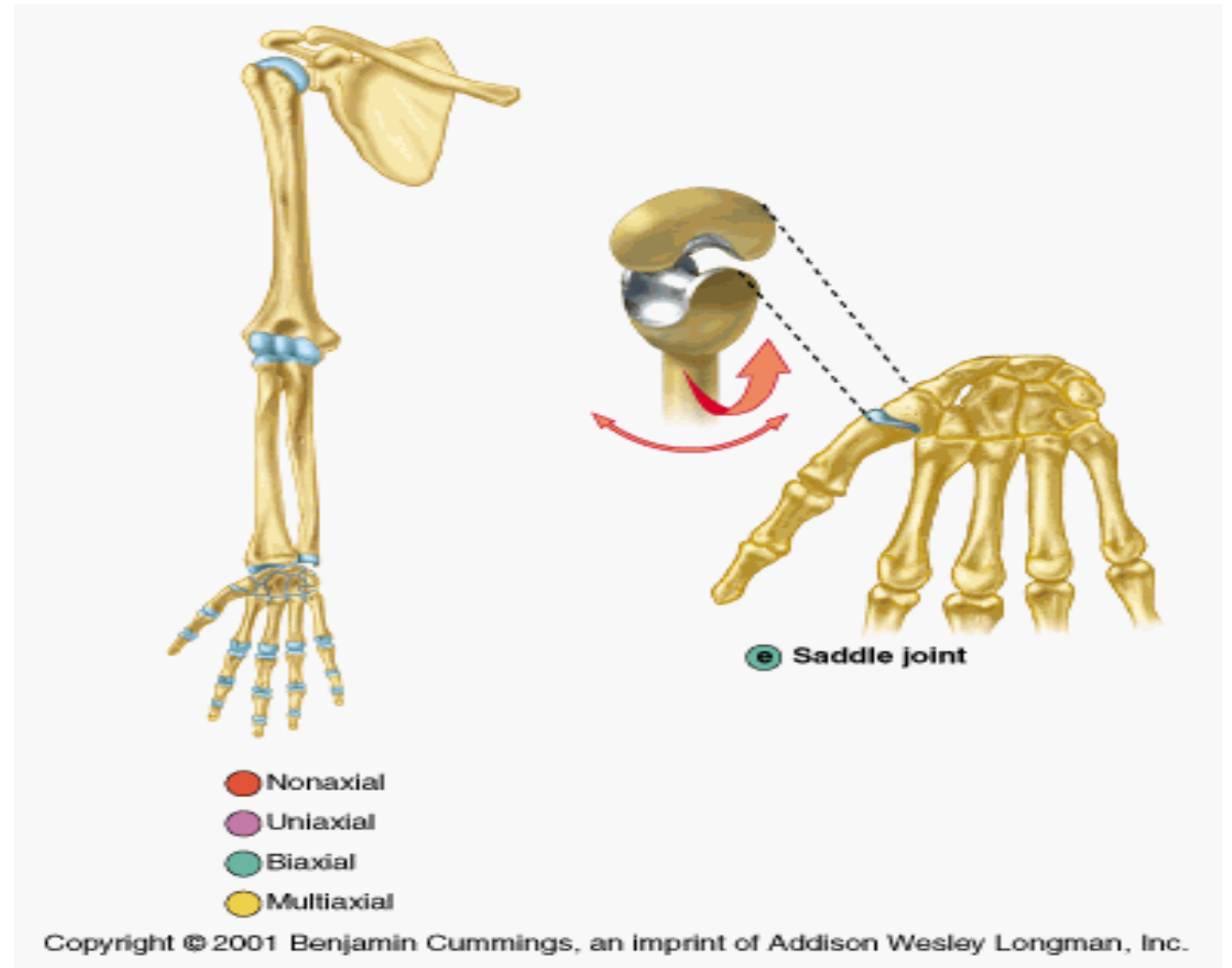
# Superior radio ulnar joint

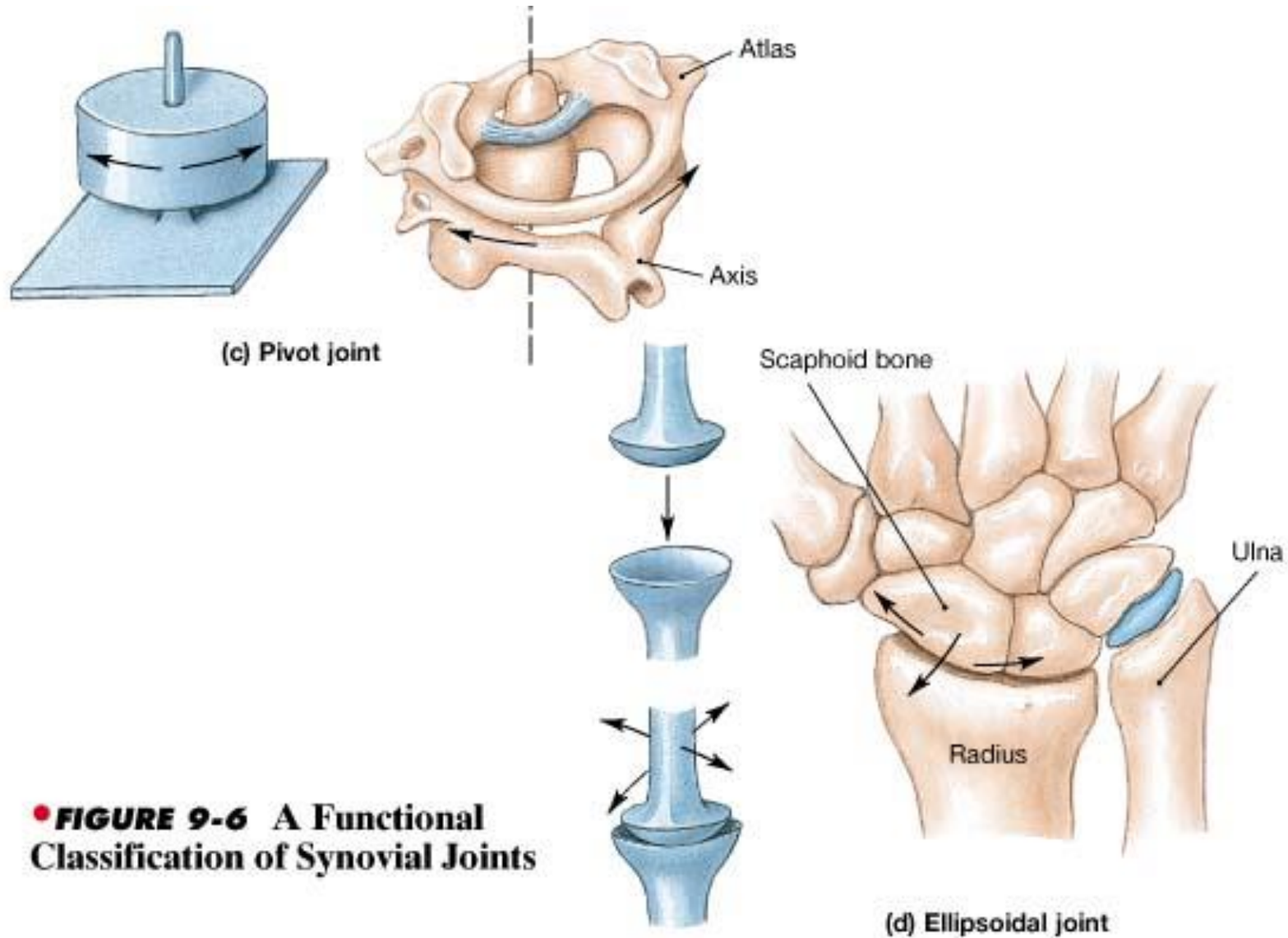


© Pivot joint

- Nonaxial
- Uniaxial
- Biaxial
- Multiaxial

# First carpometacarpal joint



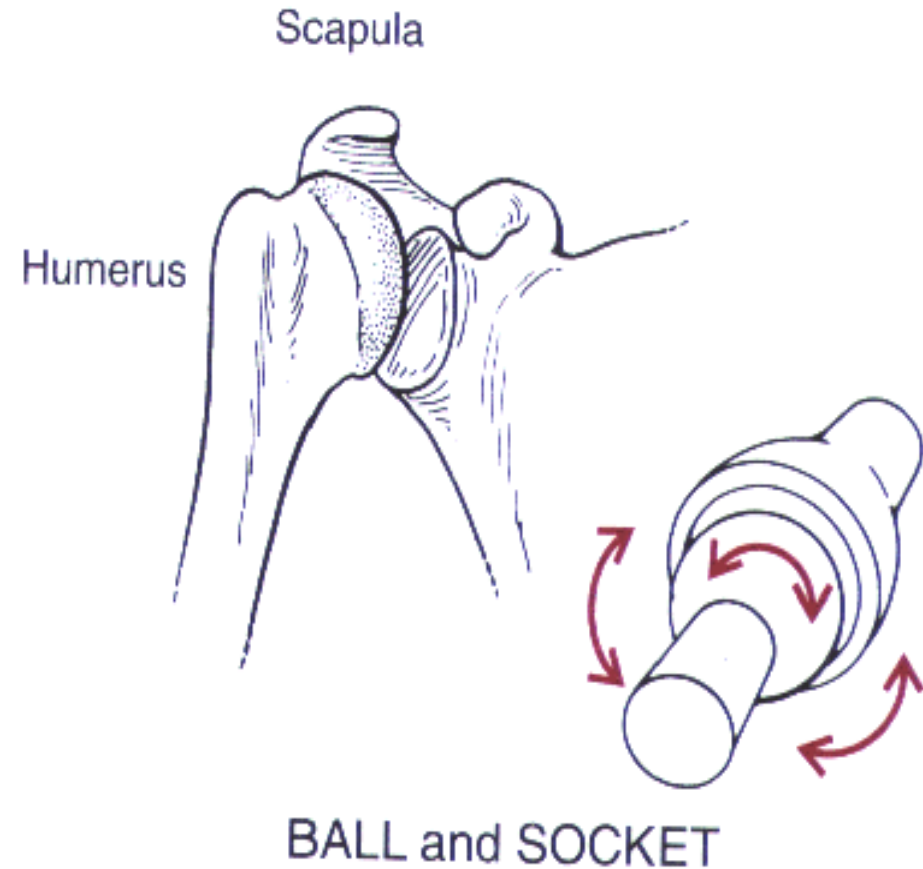


• **FIGURE 9-6** A Functional Classification of Synovial Joints

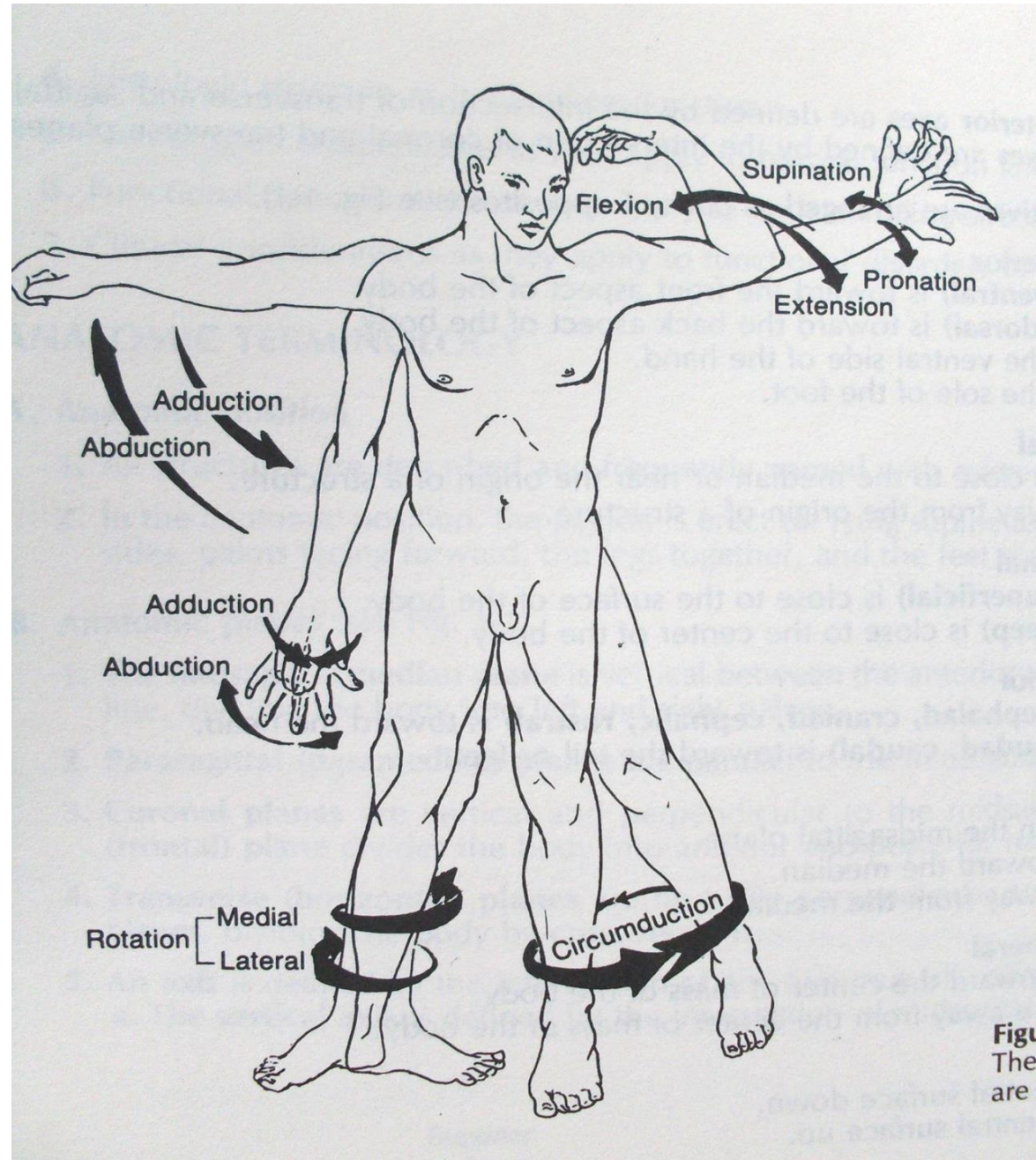


# Ball and Sockets Joints

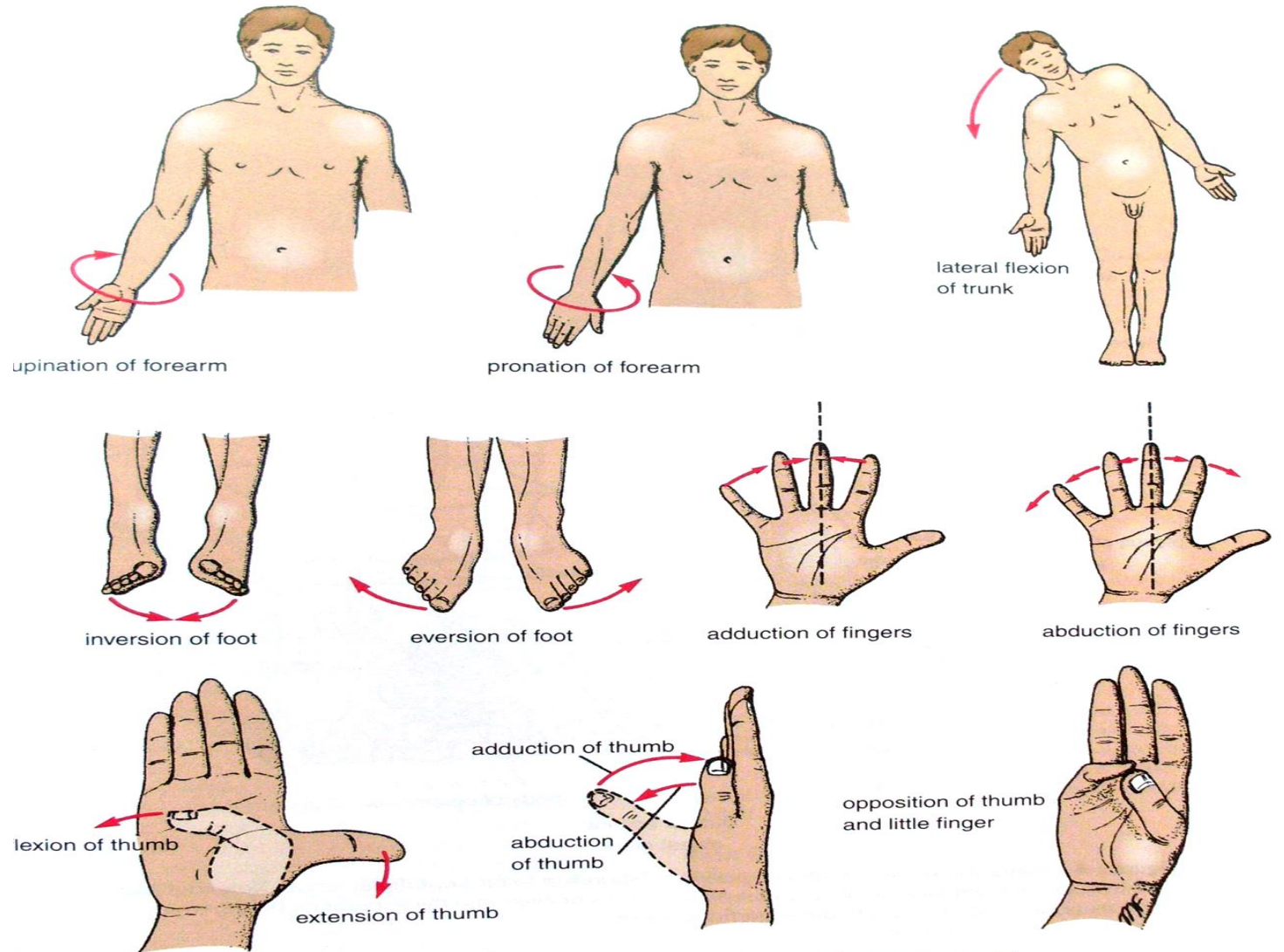
- **Ball + Socket:** spherical head + round socket
  - multiaxial movement
  - (eg) shoulder, femur,



# Movements At joints



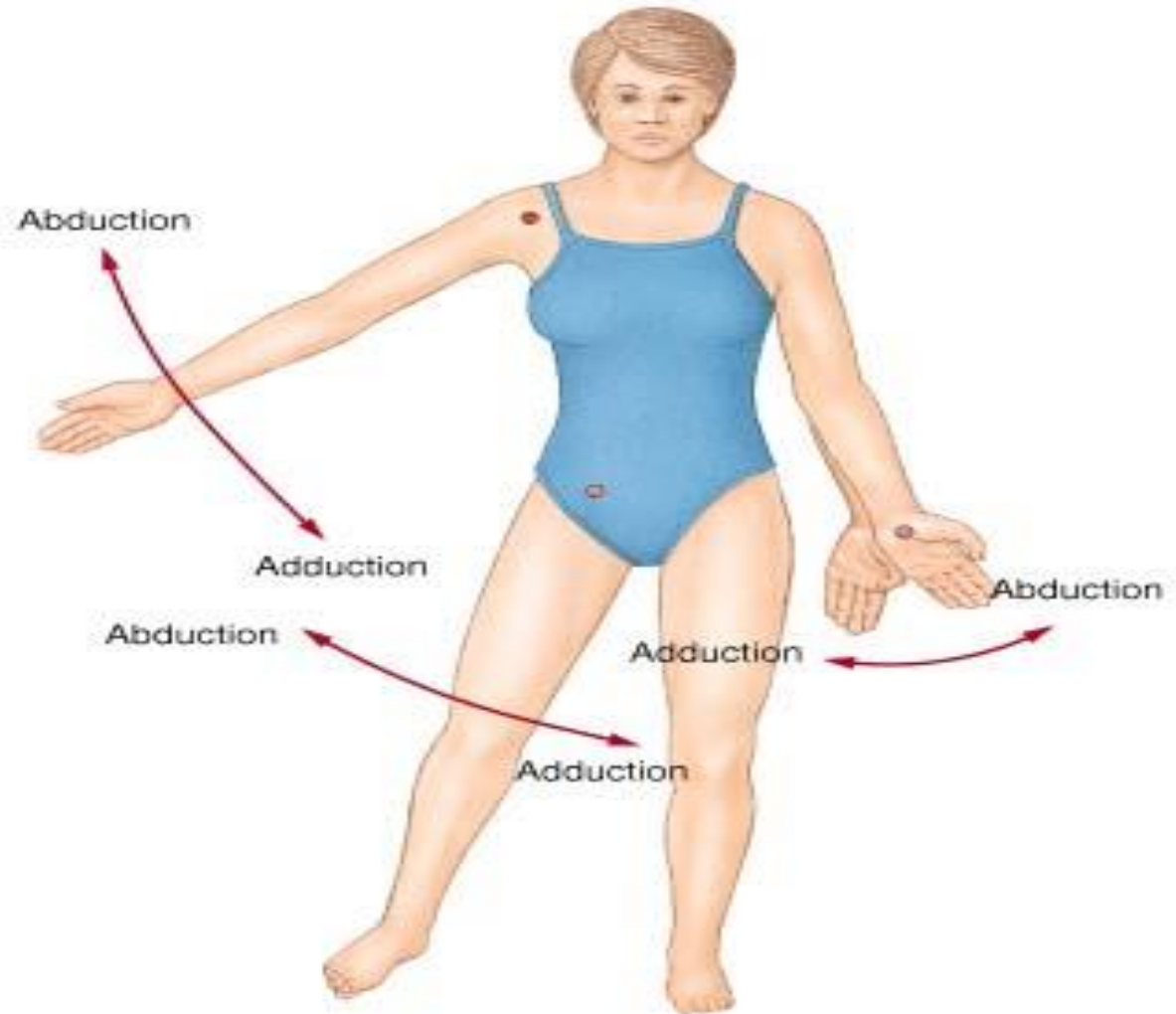
# Flexion and Extension



**Figure 1-3** Additional anatomic terms used in relation to movement.

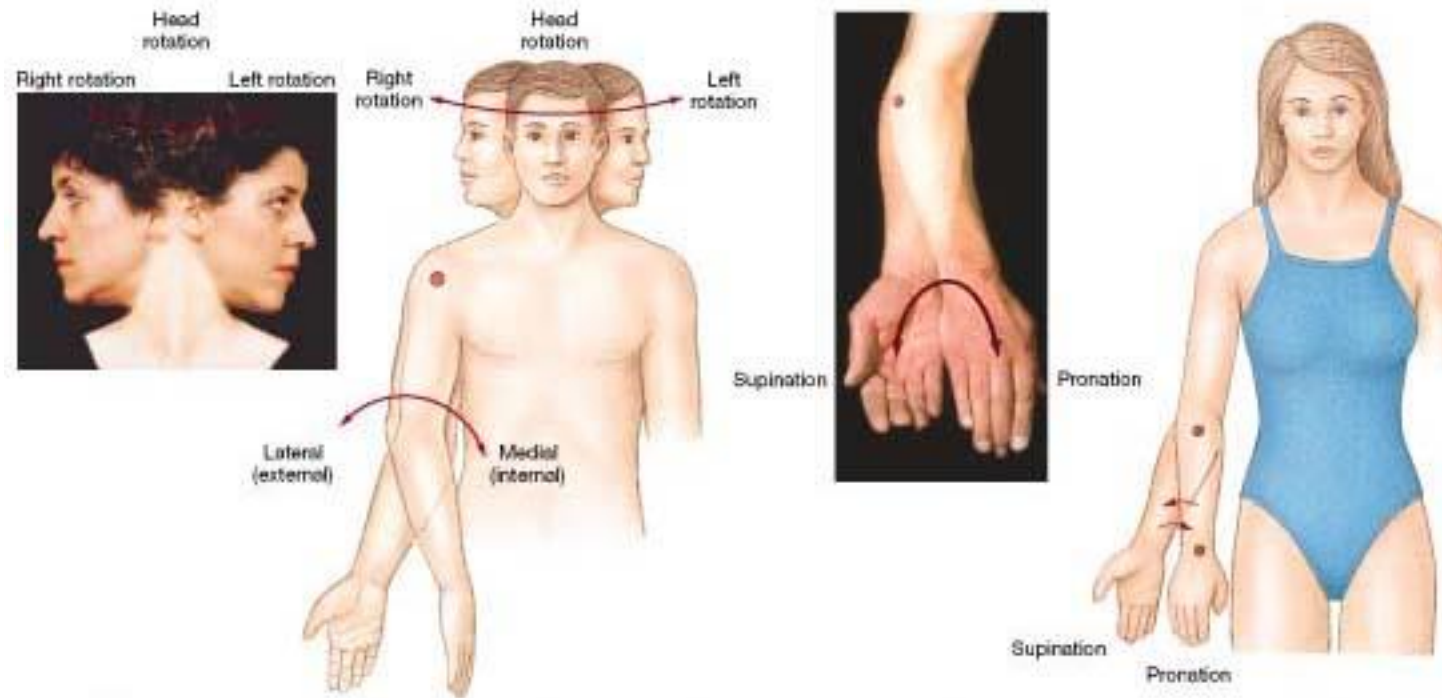
# Abduction-Adduction

• **FIGURE 9-3 Angular Movements.**  
The red dots indicate the locations of the joints involved in the illustrated movement.





# Rotation



• **FIGURE 9-4 Rotational Movements.** The red dots indicate the locations of the joints involved in the illustrated movement.

# Factors limiting joint movements

- Stretching of ligaments & capsule.
- Stiff ligaments reducing flexibility at the joint .
- Excessive tone of opposing muscles.
- Shape of articulating surfaces
- Deep socket in hip joint
- Perfect fit of joint surfaces

**Thank You**