Musculoskeletal Assessment

Nur 248

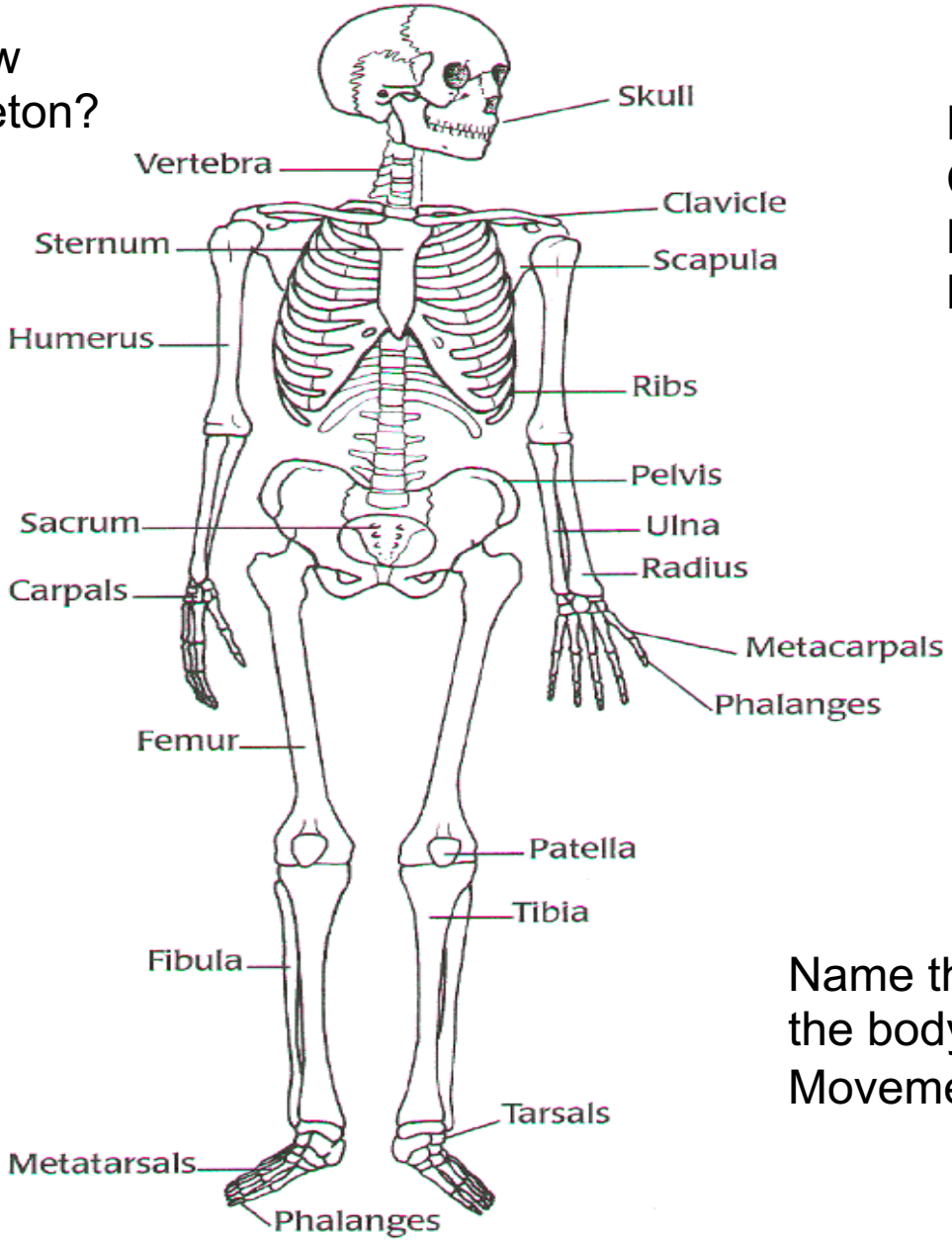
Overview

- Anatomy review
- Joints and Movement
- Assessment
  - Inspection
  - Palpation
  - Percussion
  - Joint ROM
  - Strength Testing

Musculoskeletal Assessment

- Musculoskeletal system
  - Contains-
- Functions?

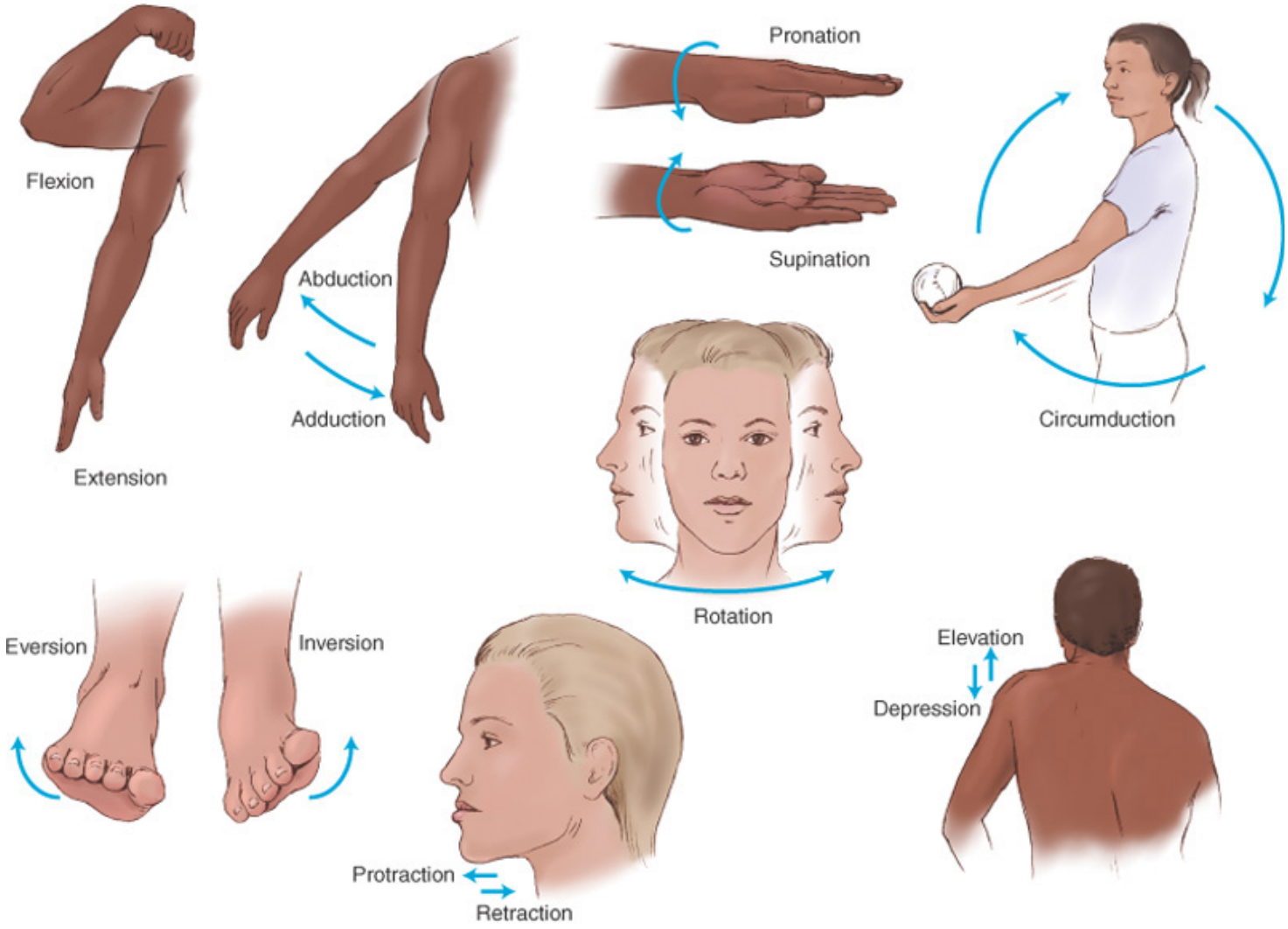
Anatomy Review
bones in skeleton?



Define:
Cartilage
Ligament
Bursa

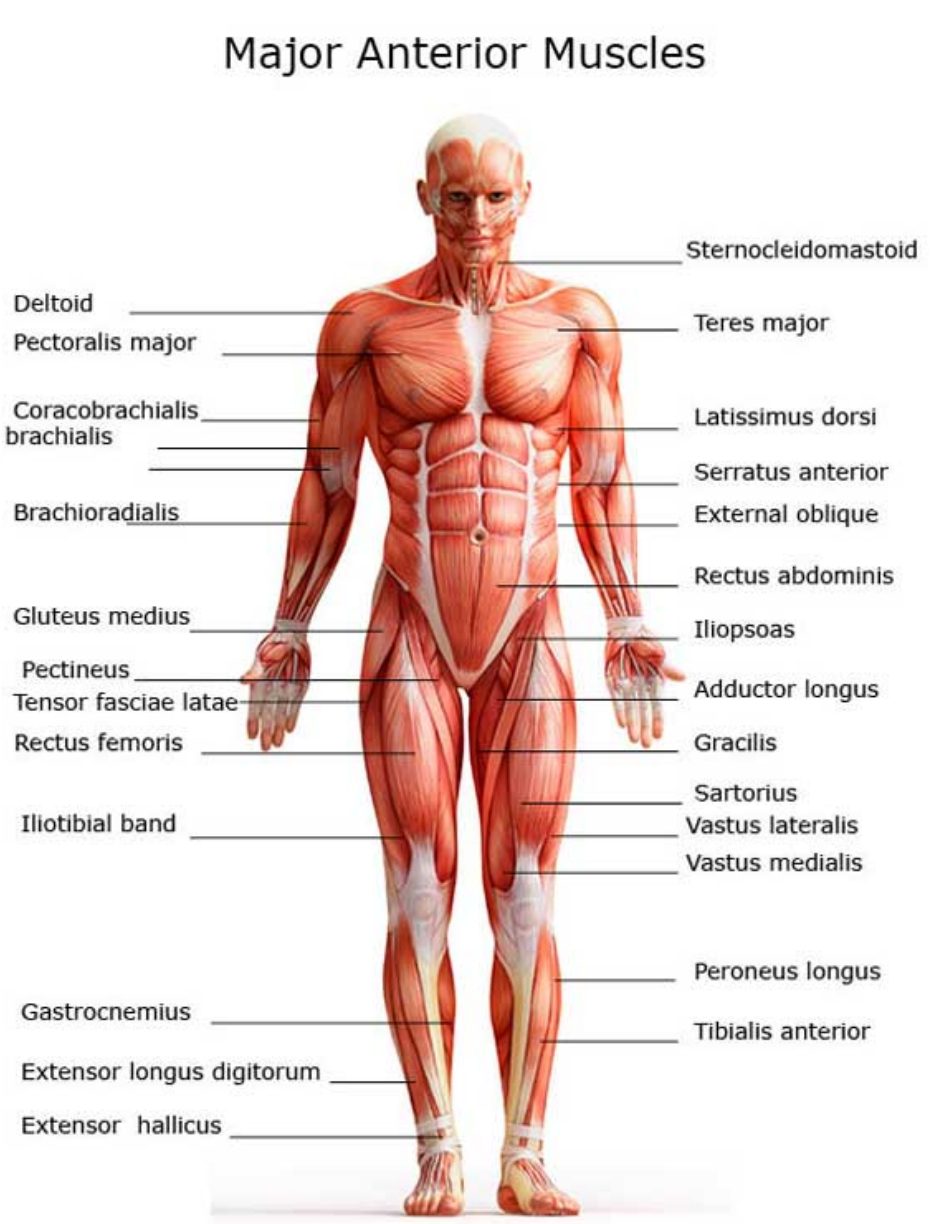
Name the types of joints in the body-
Movement of those joints?

Joint movements



http://www.med.umich.edu/lrc/Hypermuscle/Hyper.html#flex

Muscles


Major Anterior Muscles
Sternocleidomastoid
Deltoid
Pectoralis major
Teres major
Coracobrachialis
brachialis
Latissimus dorsi
Serratus anterior
Brachioradialis
External oblique
Rectus abdominis
Gluteus medius
Iliopsoas
Pectineus
Tensor fasciae latae
Adductor longus
Rectus femoris
Gracilis
Sartorius
Iliotibial band
Vastus lateralis
Vastus medialis
Peroneus longus
Gastrocnemius
Tibialis anterior
Extensor longus digitorum
Extensor hallicus

Musculoskeletal System

- History:
  - Joint pain, stiffness, swelling, movement limitation
  - Muscle pain, weakness
  - History of trauma/fractures, deformity
  - Exercise pattern
  - Elderly- functionality ability to do ADL's

Assessment of Musculoskeletal System

- Inspection
- Palpation
- Percussion- usually only of vertebrate to illicit tenderness
- Range of Motion
- Strength testing

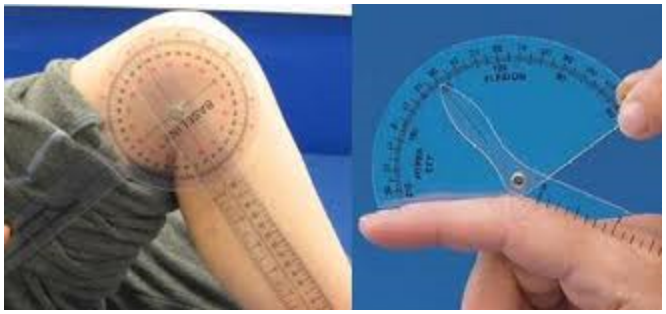
- Move systematically from head to feet, medial to lateral

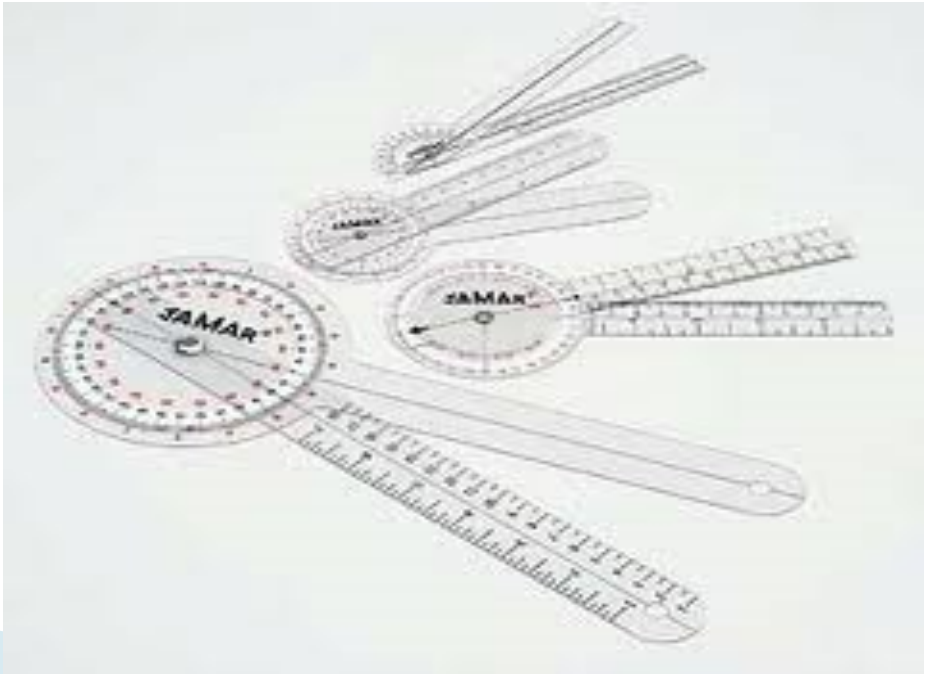
Musculoskeletal System

- Assessment:
  - Inspection (joint symmetry/deformity, size, contour)
  - Palpation
    - Free movement
    - Crepitus, heat, tenderness, swelling, masses, “bogginess”)

Musculoskeletal System

- Range of Motion (ROM)
  - Different joints will have different ranges of motion.
  - Can measure it using a goniometer
  - Measured as the number of degrees of an angle
  - For screening: usually note full ROM or limited and describe.





Strength Testing

- Strength 0-5 scale
- 5+=Full ROM against gravity and full resistance
- 4+= Full ROM against gravity and some resistance
- 3+=Full ROM with gravity
- 2+= Full ROM without gravity (passive ROM)
- 1+=Slight contraction of muscle
- 0=No contraction of muscle

Specific Joint Assessment

Temporal-mandibular Joint

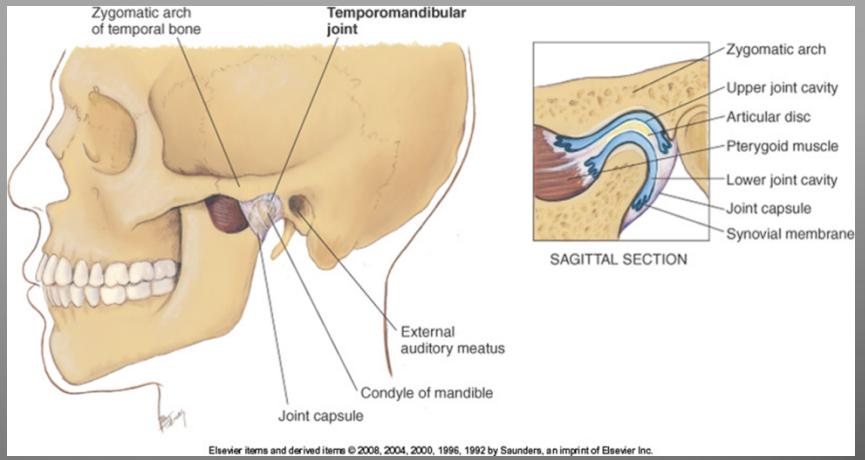
- Temporal-mandibular Joint: (TMJ): articulation of mandible and temporal bone

  3 types of movement:

  Hinge action: open/close mouth

  Gliding action: protrusion and retraction

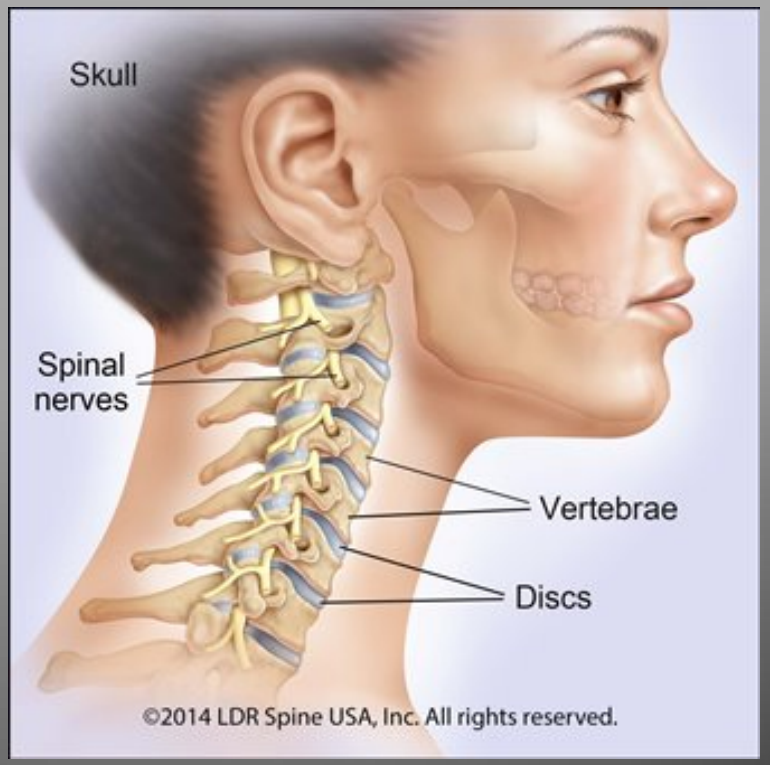
  Gliding action: side to side movement of jaw



Cervical Spine

- 7 Cervical vertebrate
  - Atlas/axis joint C1 & C2- most moveable
- Major Muscles
  - Trapezius
  - Sternocleidomastoid
- Inspect – Symmetry, muscles
- Palpate muscles, vertebrate
- ROM –
  - Flexion 45°, extension 55°, lateral bending 40°, rotation 70°

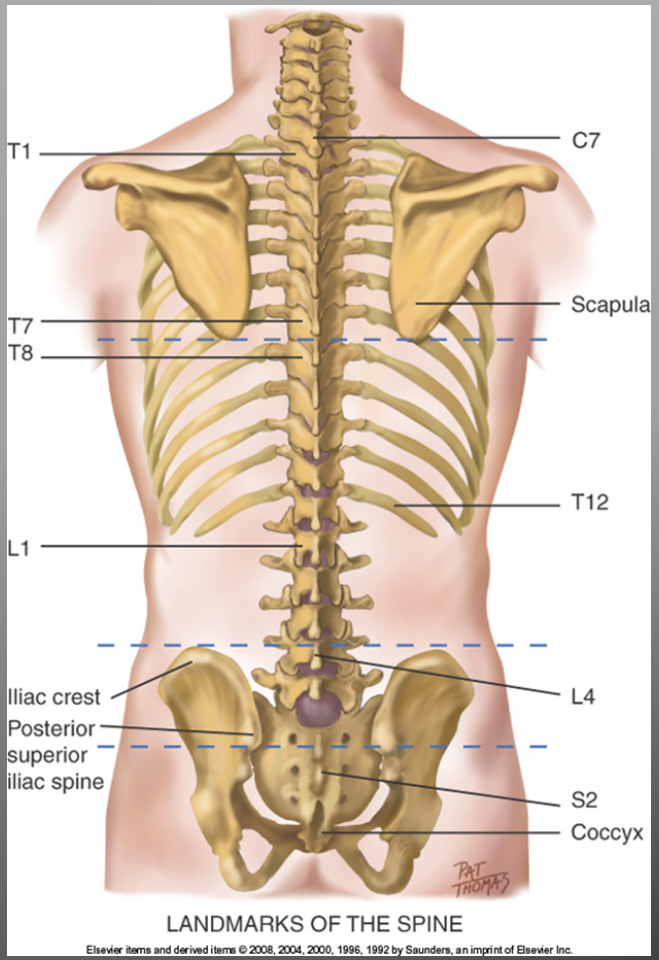
Strength – Trapezius, sternocleidomastoid



Spine

- Inspect- curvature, landmarks
- Palpate: Spinous processes can be felt in furrow down back
- Furrow also has paraspinal vertebral muscles on either side of the vertebral processes

Note landmarks – orientation for documentation of findings



LANDMARKS OF THE SPINE

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Normal S curve

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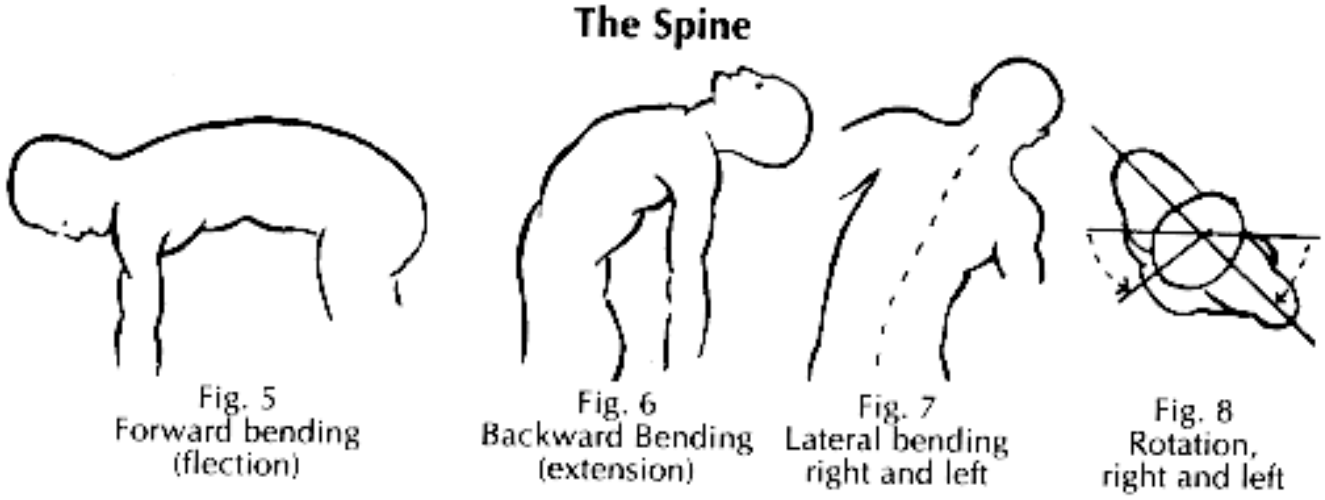
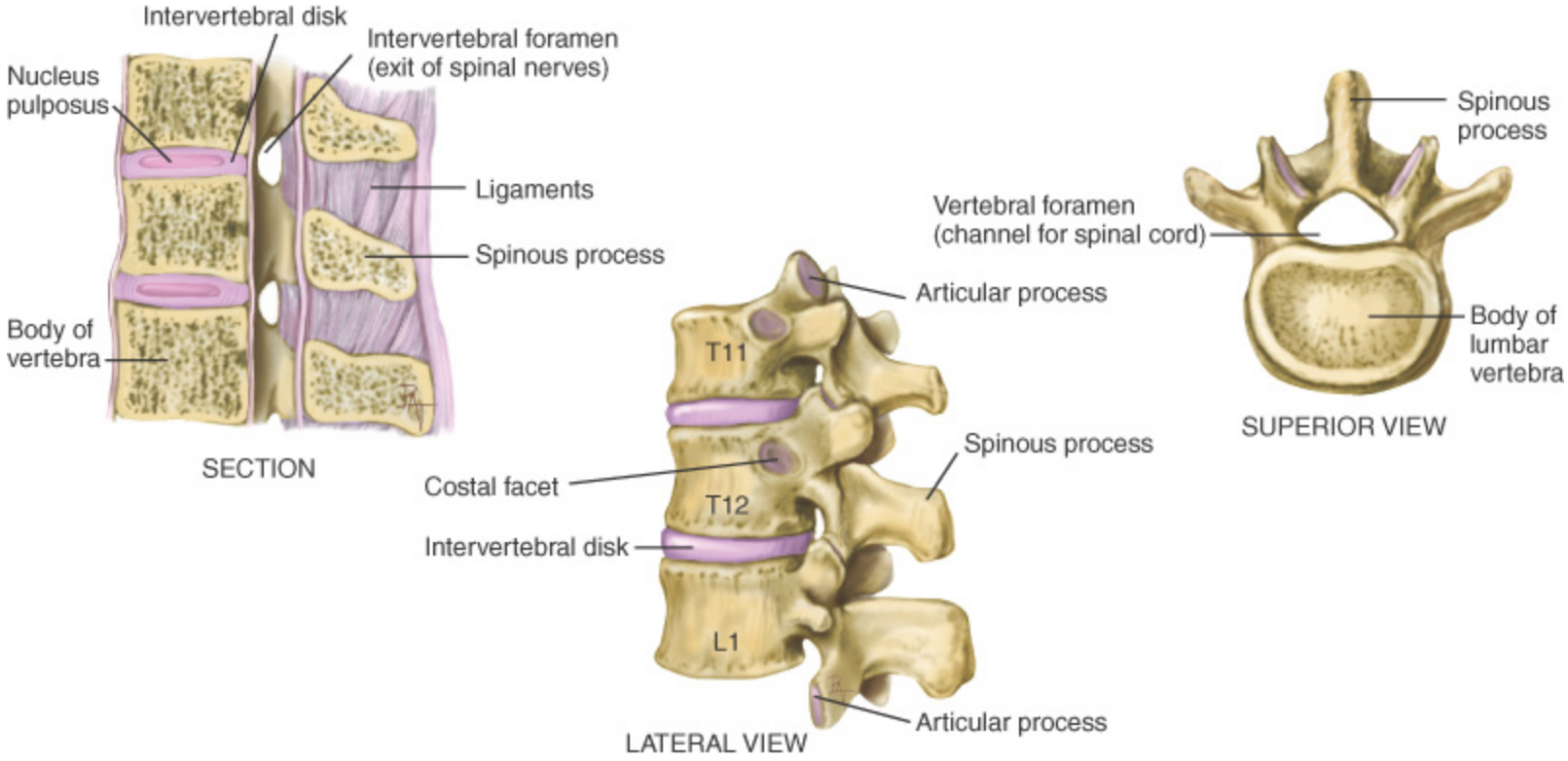
Spine Movement

- Flexion – forward bending 90°
- Extension– bending backward 30°
- Lateral bending– bending either side 35°
- Rotation–at waist line most prominent 30°



Intervertebral discs are shock absorbers for compression



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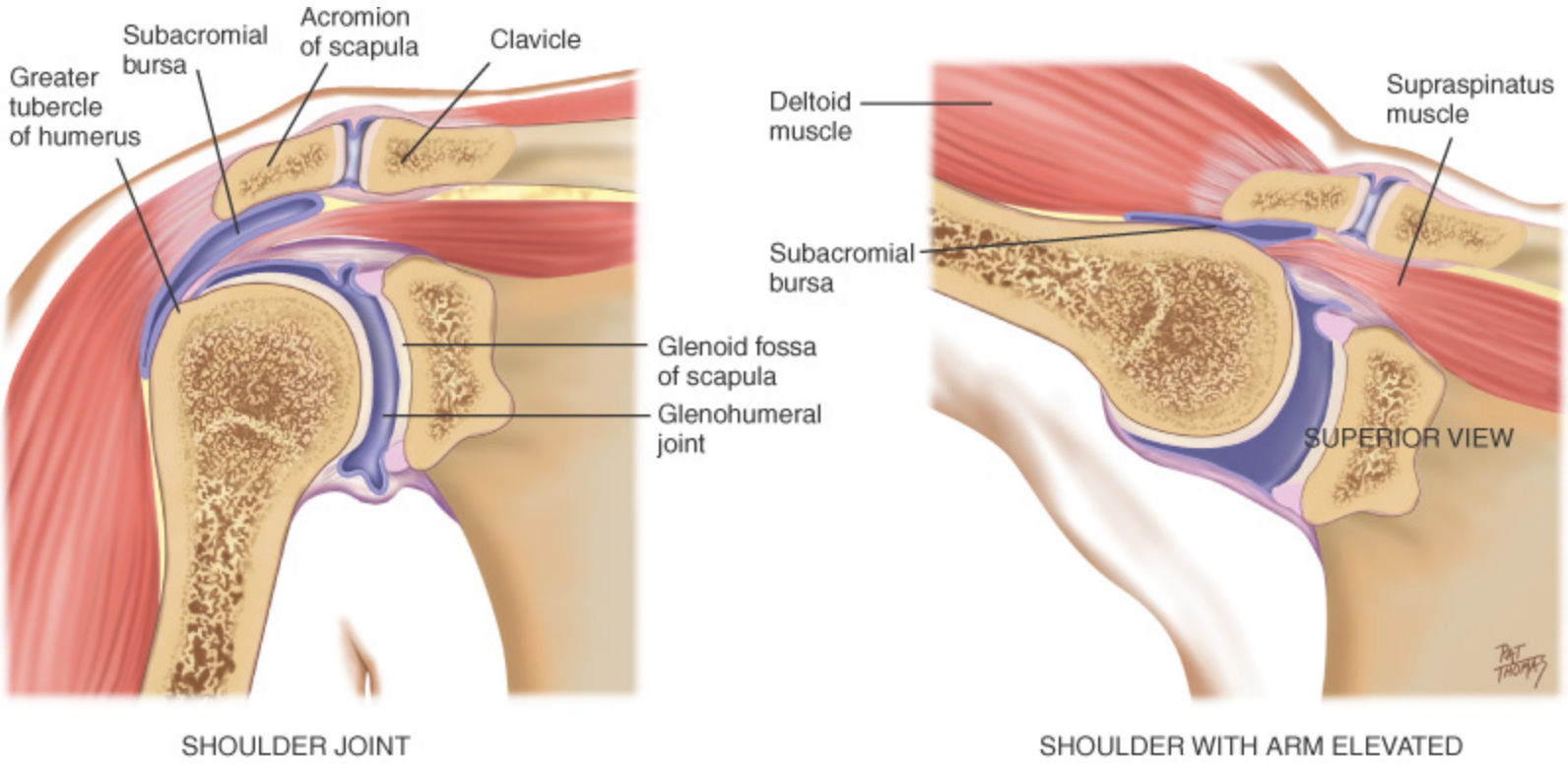
Shoulder



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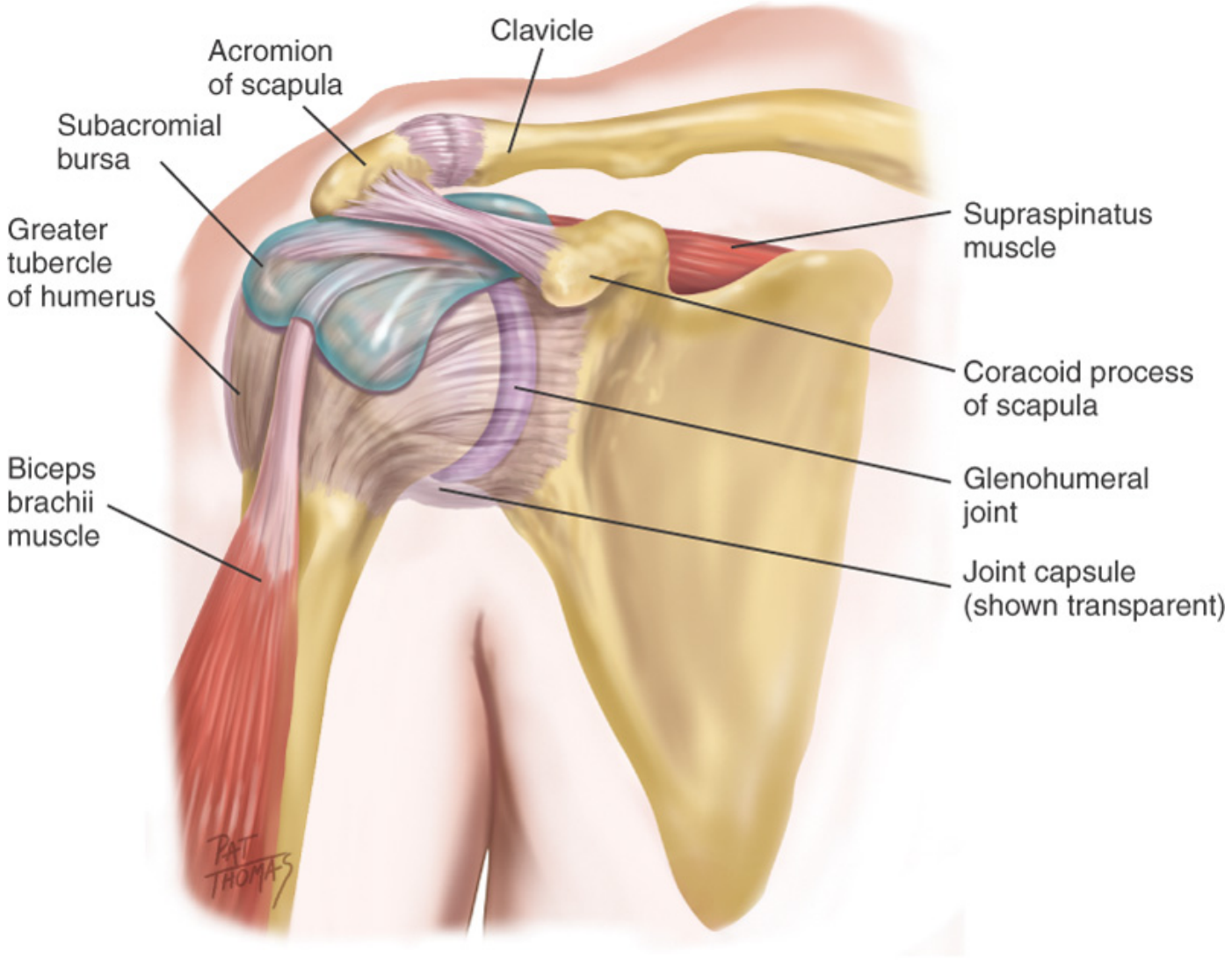
Anterior view



BONY LANDMARKS OF THE SHOULDER - POSTERIOR VIEW

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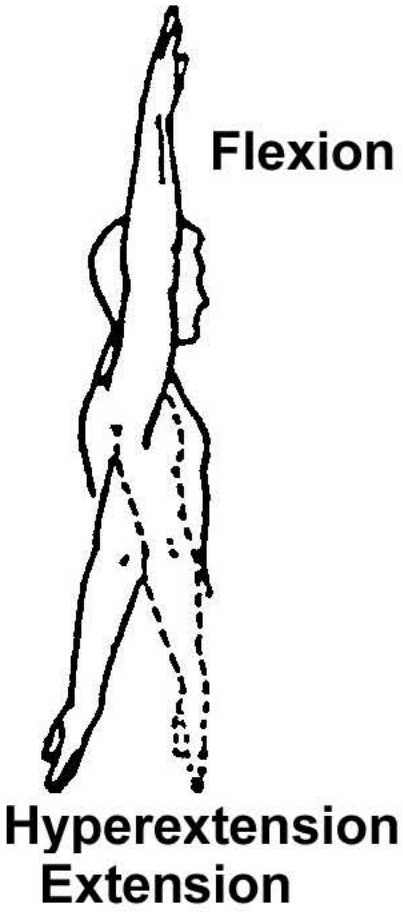
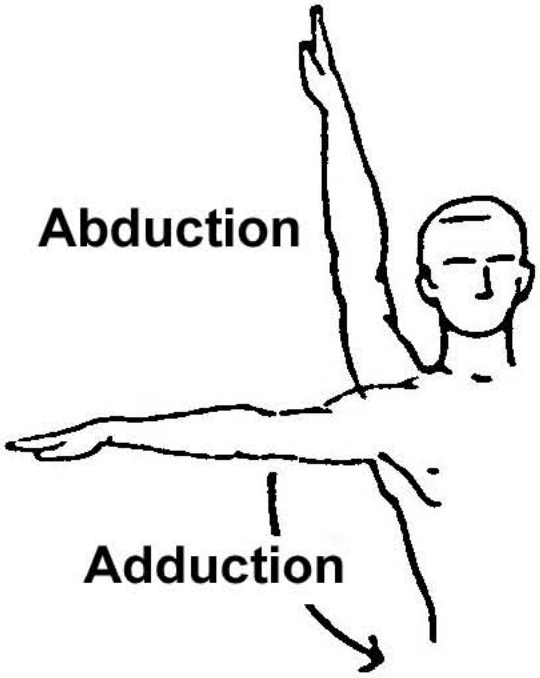
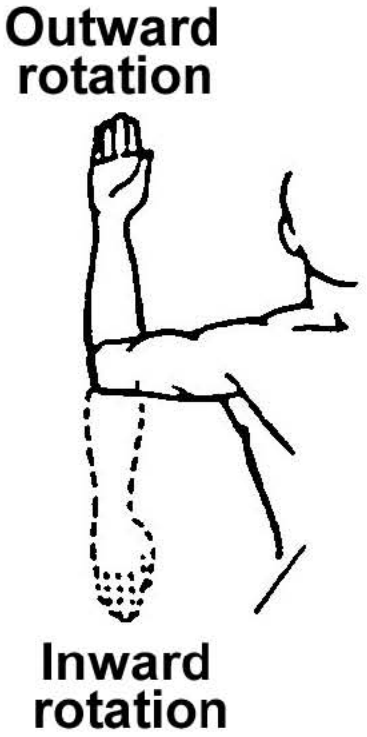
Shoulder ROM



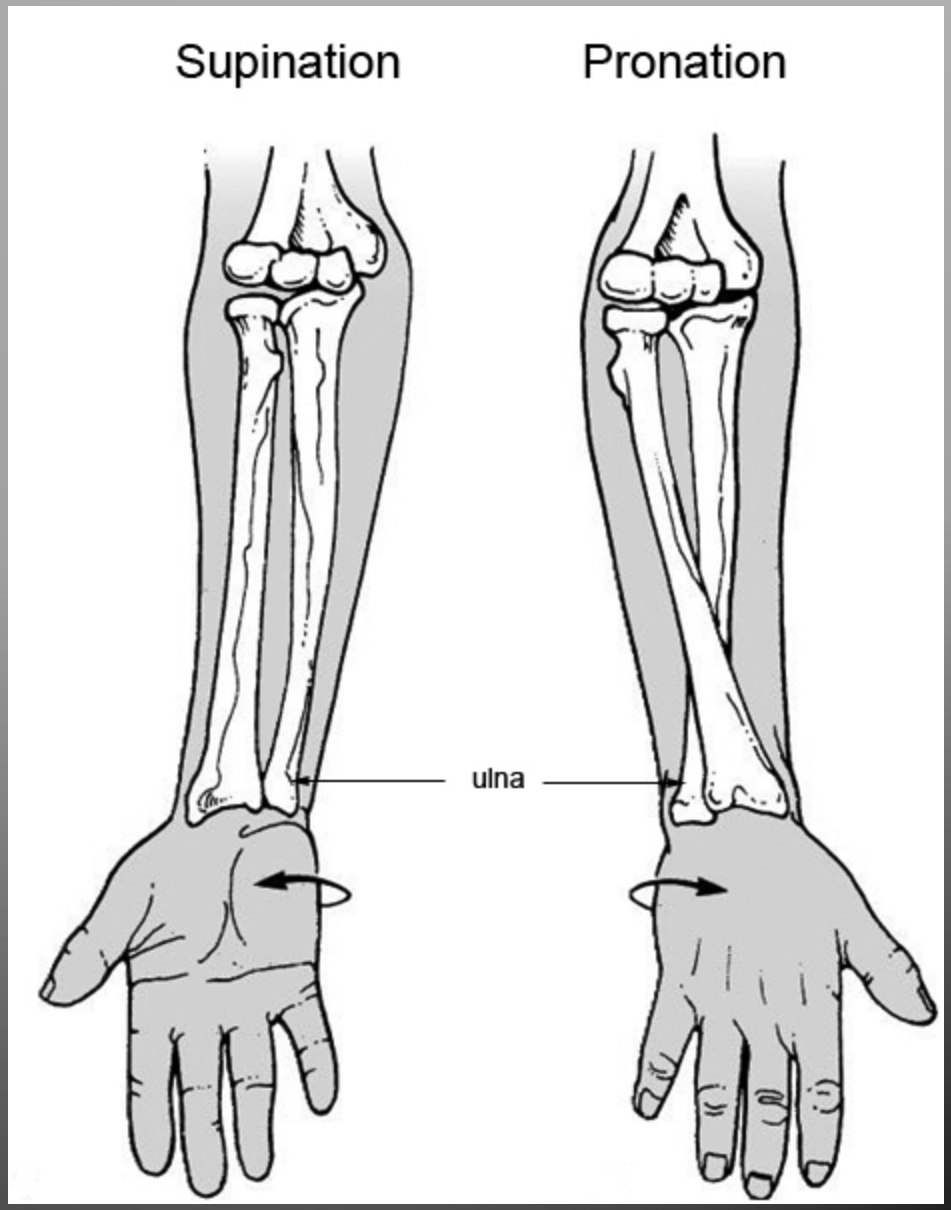


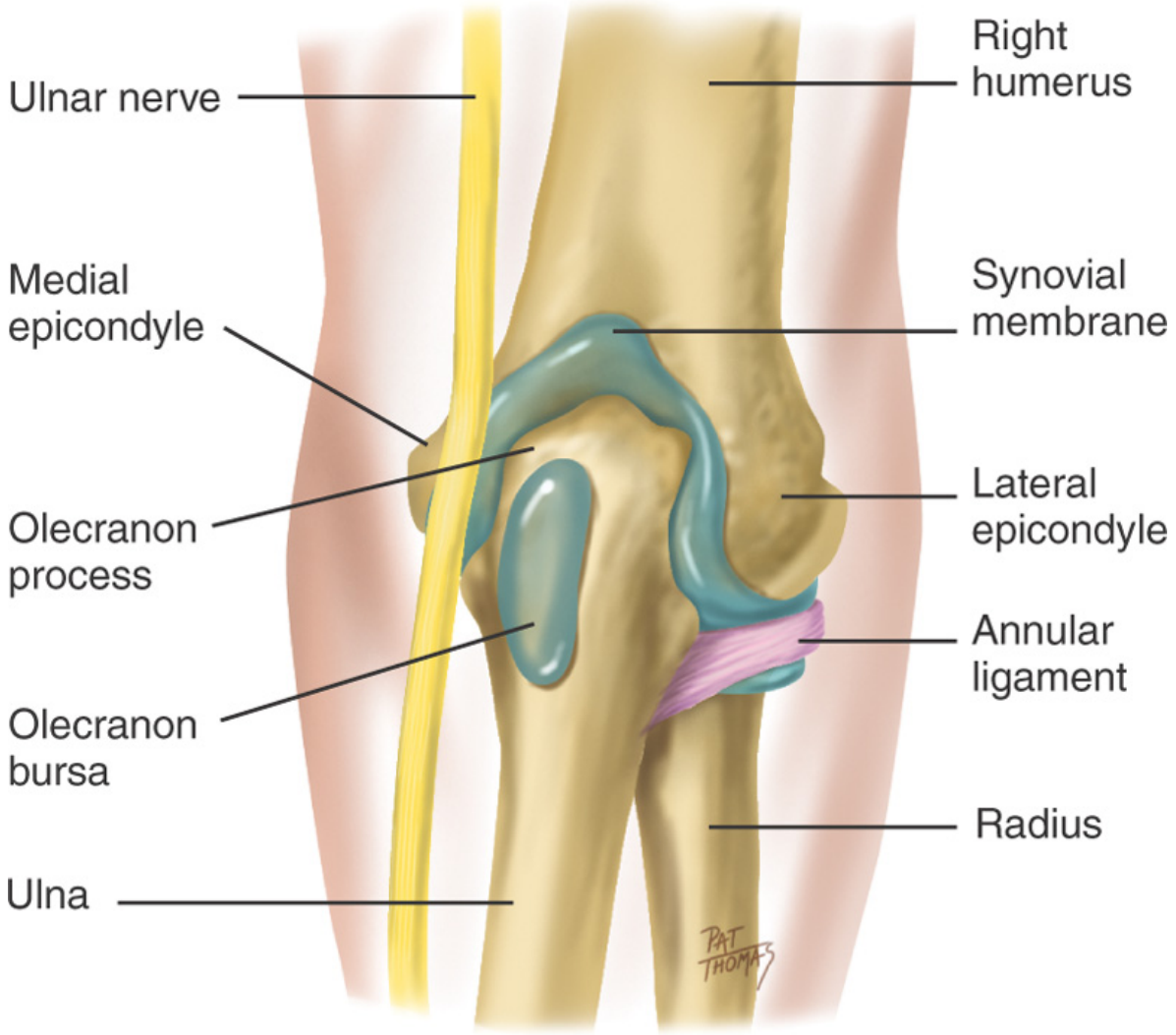


- Strength: Deltoid (pectoralis, scapular muscles)

Elbow

- Articulations of humerus, radius, and ulna of forearm
- ROM: Flexion (160 °) and extension (0 °) through hinge action
- Landmarks (Inspect/palpate):
- medial and lateral epicondyles of humerus
- 90° and pronation 90° of the forearm
- Strength: biceps/triceps





RIGHT ELBOW - POSTERIOR VIEW

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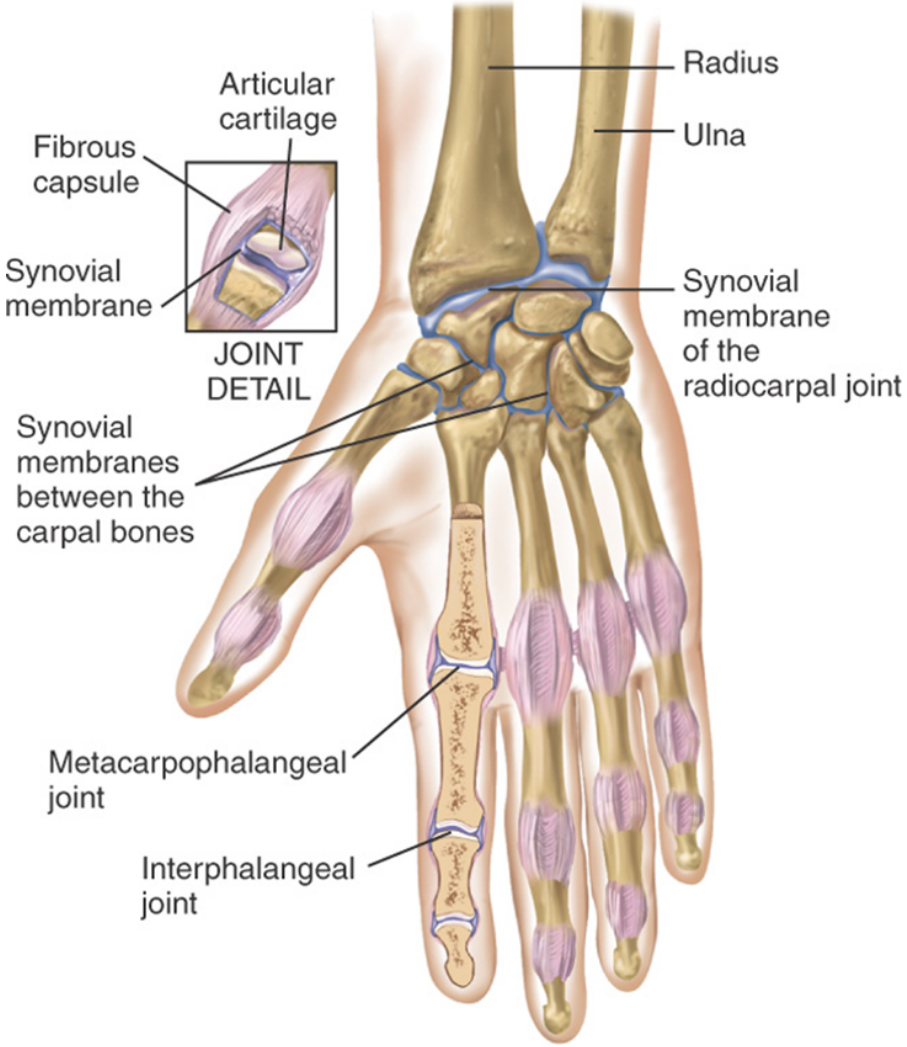
Wrist and Carpals



BONES OF THE HAND - PALMAR VIEW

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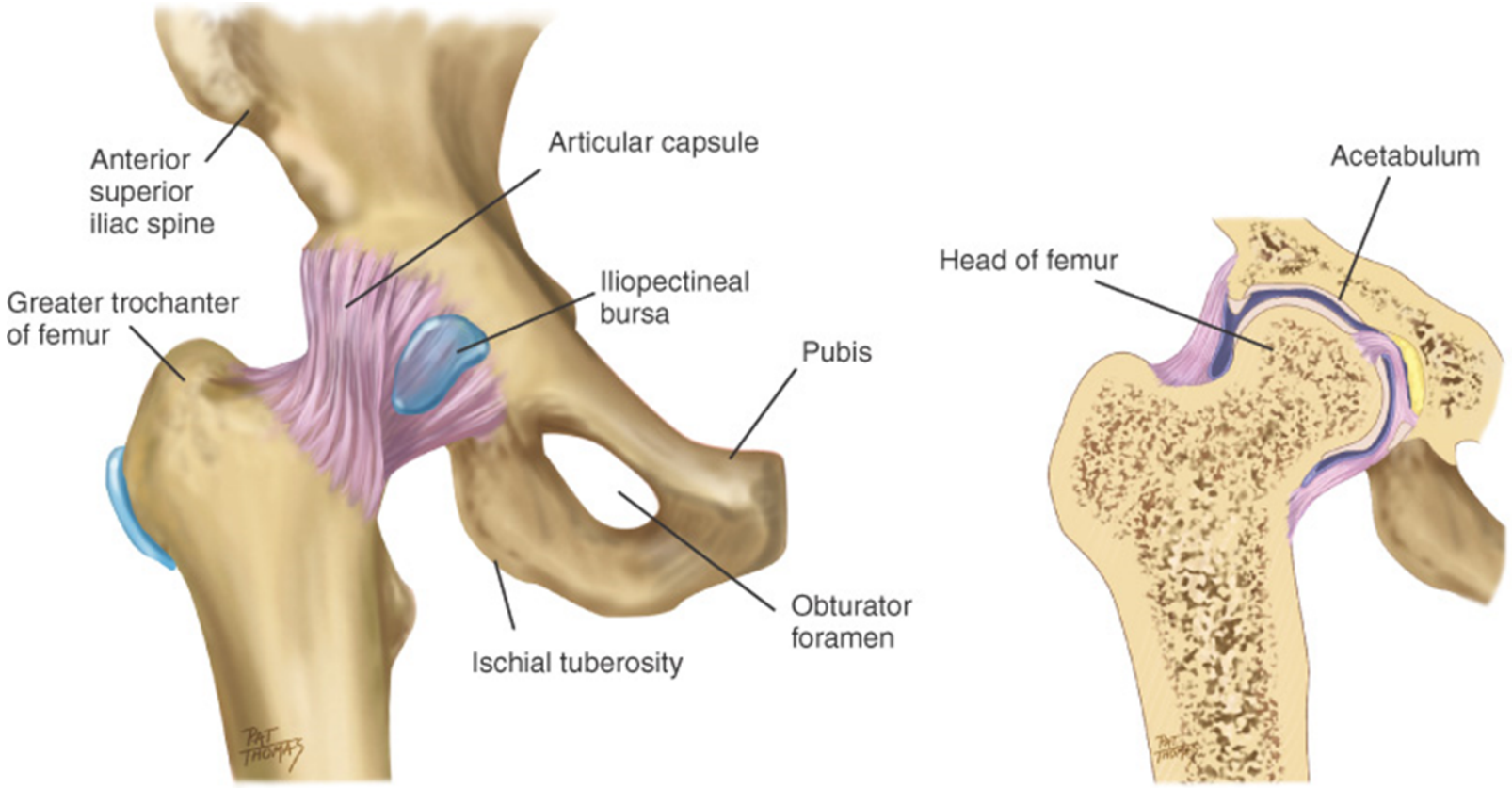
Hip



HIP JOINT

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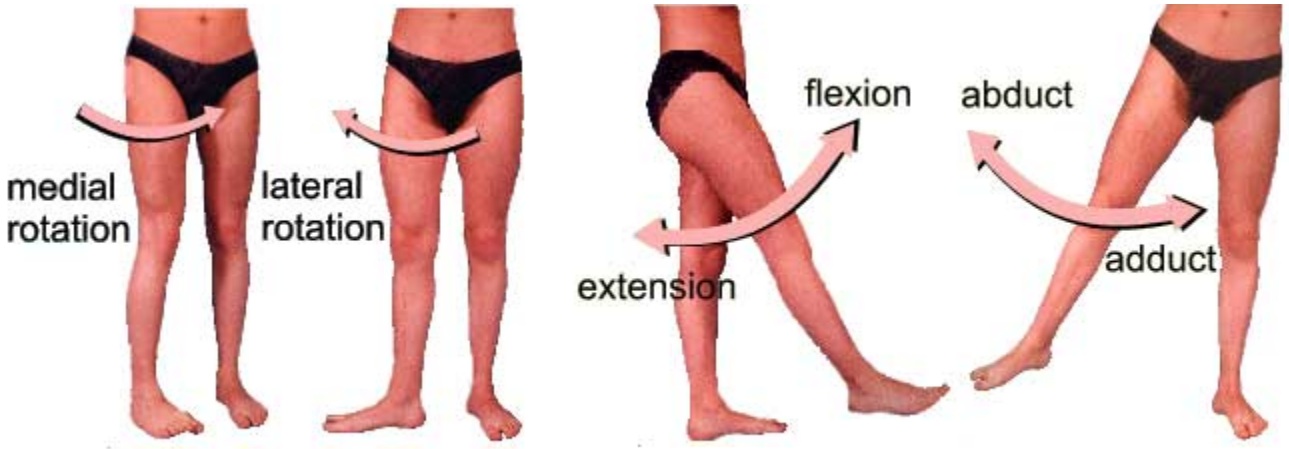
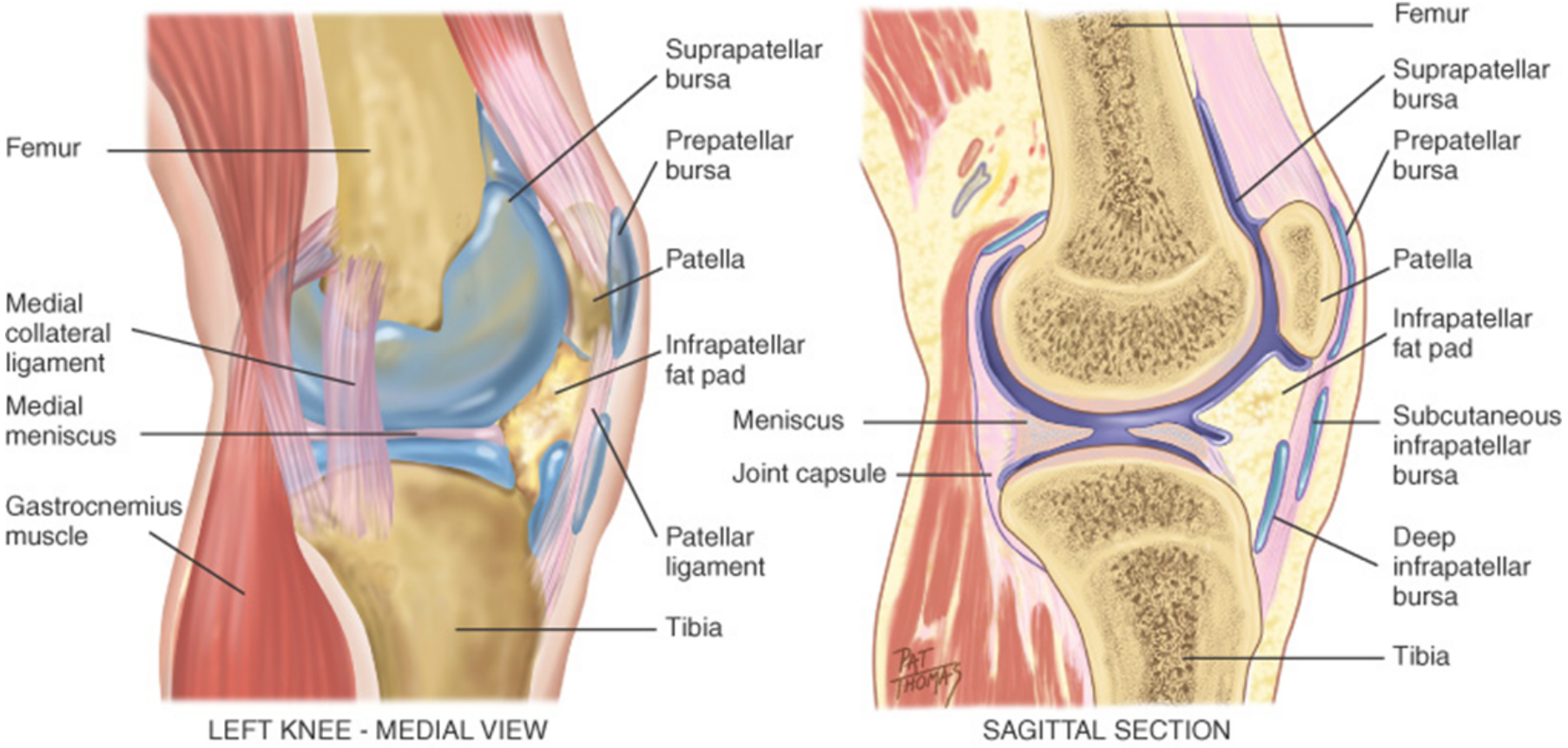
Hip

- Movement – flexion (90 °)extension (30 °)
- abduction (45 °), adduction (30 °)
- internal (40 °) rotation,external (45 °) rotation
- circumduction
- Strength: gluteals, Quadriceps/Biceps Femoris



Knee

Inspect, Palpate, ROM- flexion/extension
Strength- Quadriceps and Biceps femoris



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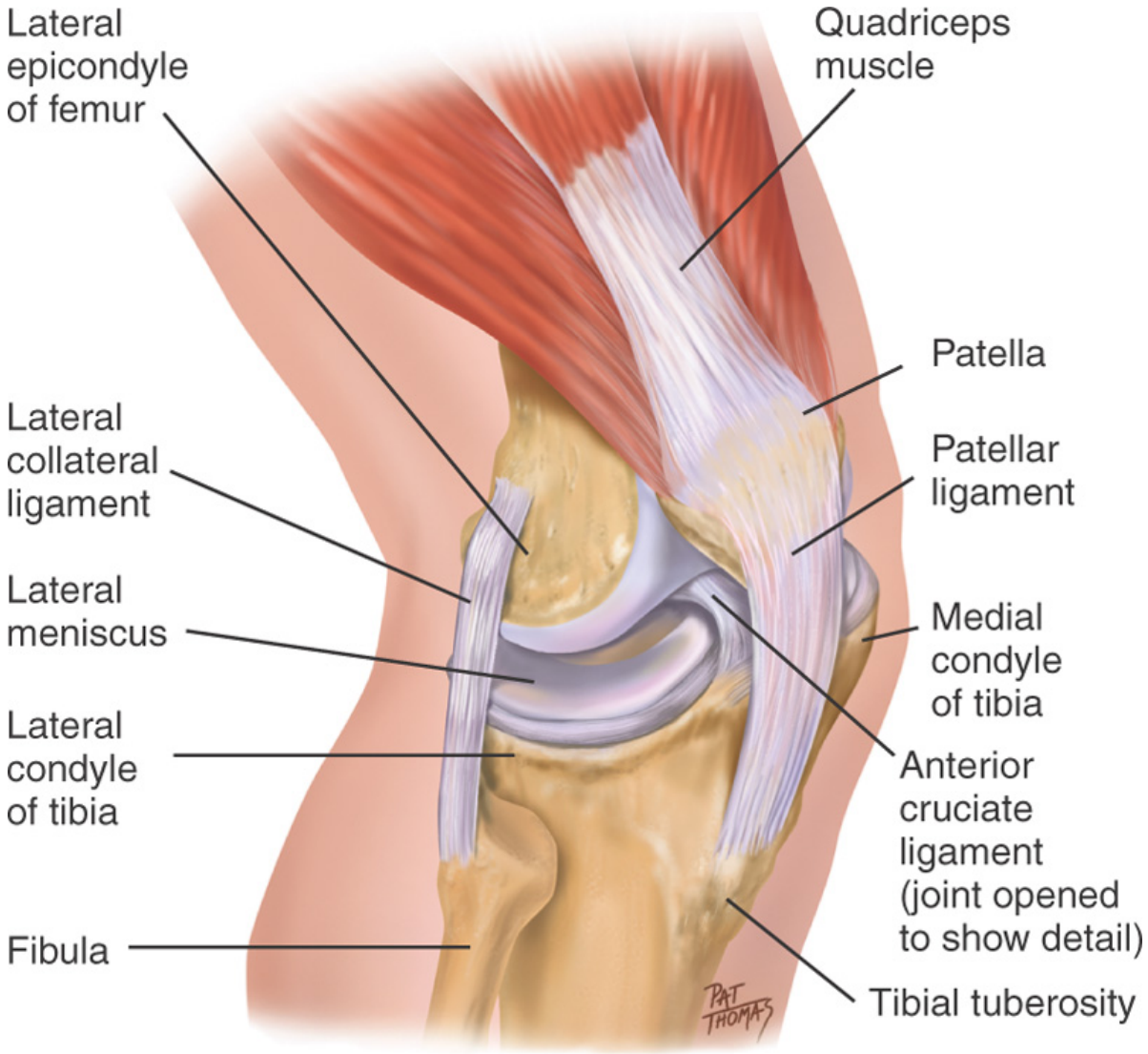

LANDMARKS OF THE RIGHT KNEE JOINT

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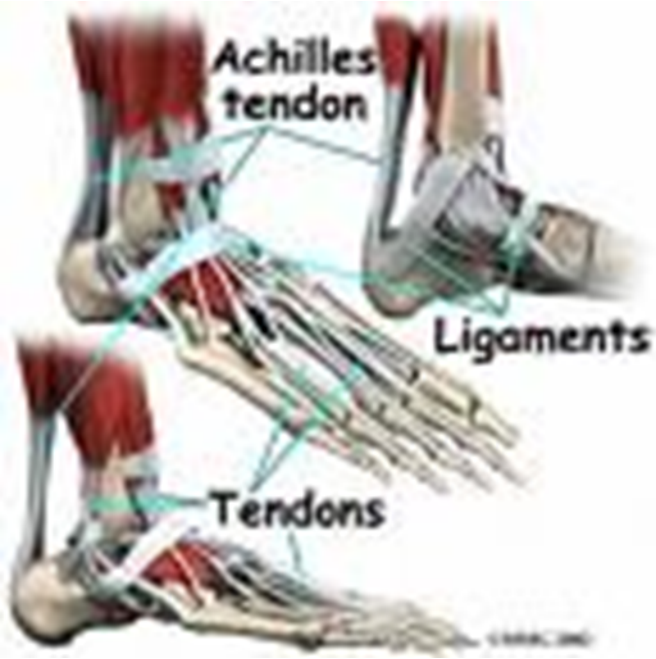
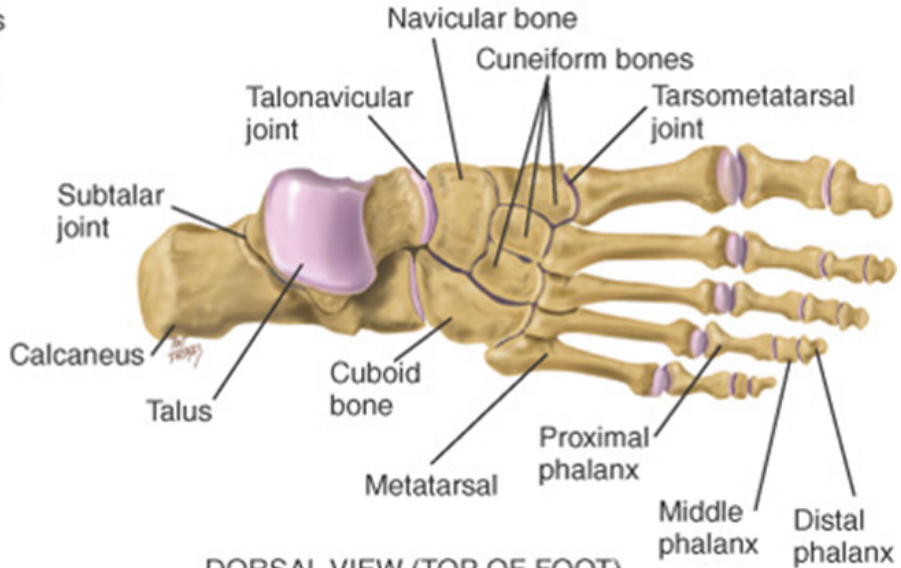
Ankle and Foot



ANKLE JOINT IN SECTION



DORSAL VIEW (TOP OF FOOT)

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Ankle/Foot

- Inspect/Palpate:
- ROM :
  - Dorsiflexion/Plantar flexion
  - Eversion/Inversion
  - Toes: flexion/extension
- Strength: Gastrocnemius/Tibialis Anterior

Developmental Considerations

- Infants:
  - Spine is C-shaped
  - Ortolani's maneuver to check for congenital hip dislocation
  - Joints more moveable
- Children:
  - Epiphyses: growth plates where length growth occur in children – any fracture or infection in this area = risk for bone deformity
  - Genu Varum – bowlegged, normal for one year after a child starts walking
  - Genu Valgum – knock-knee, normal 2 ½ to 3 yoa (may indicate rickets)
  - Scoliosis (Abnormal curvature of spine, pre-pubescent girls)

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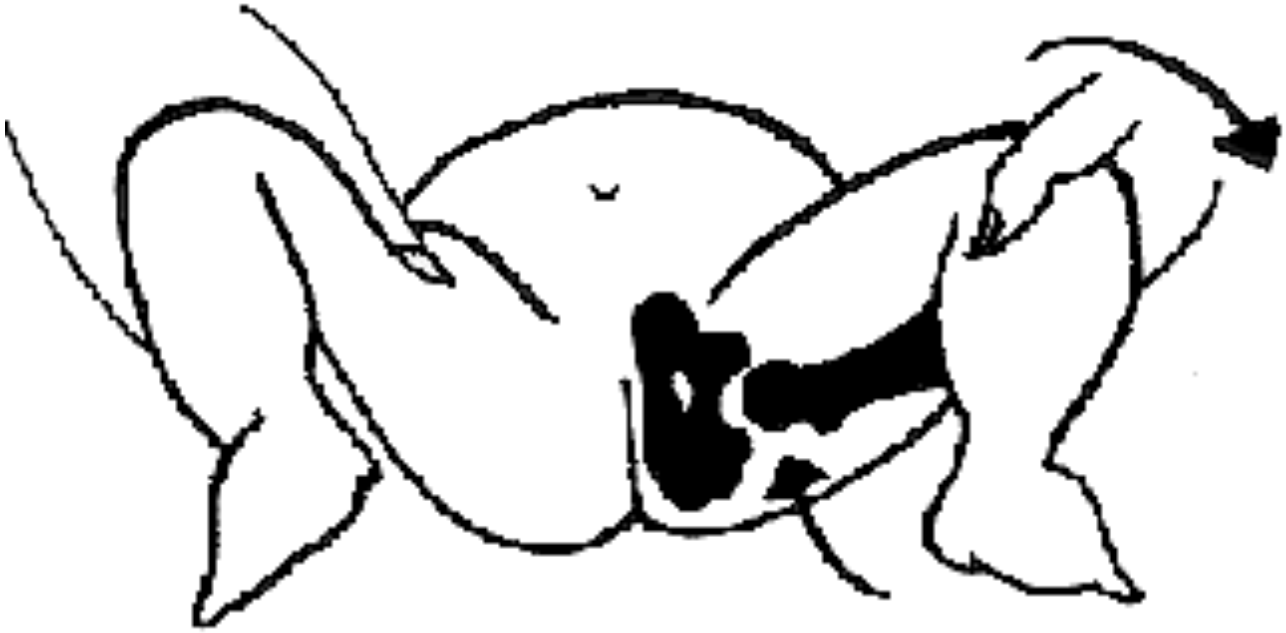

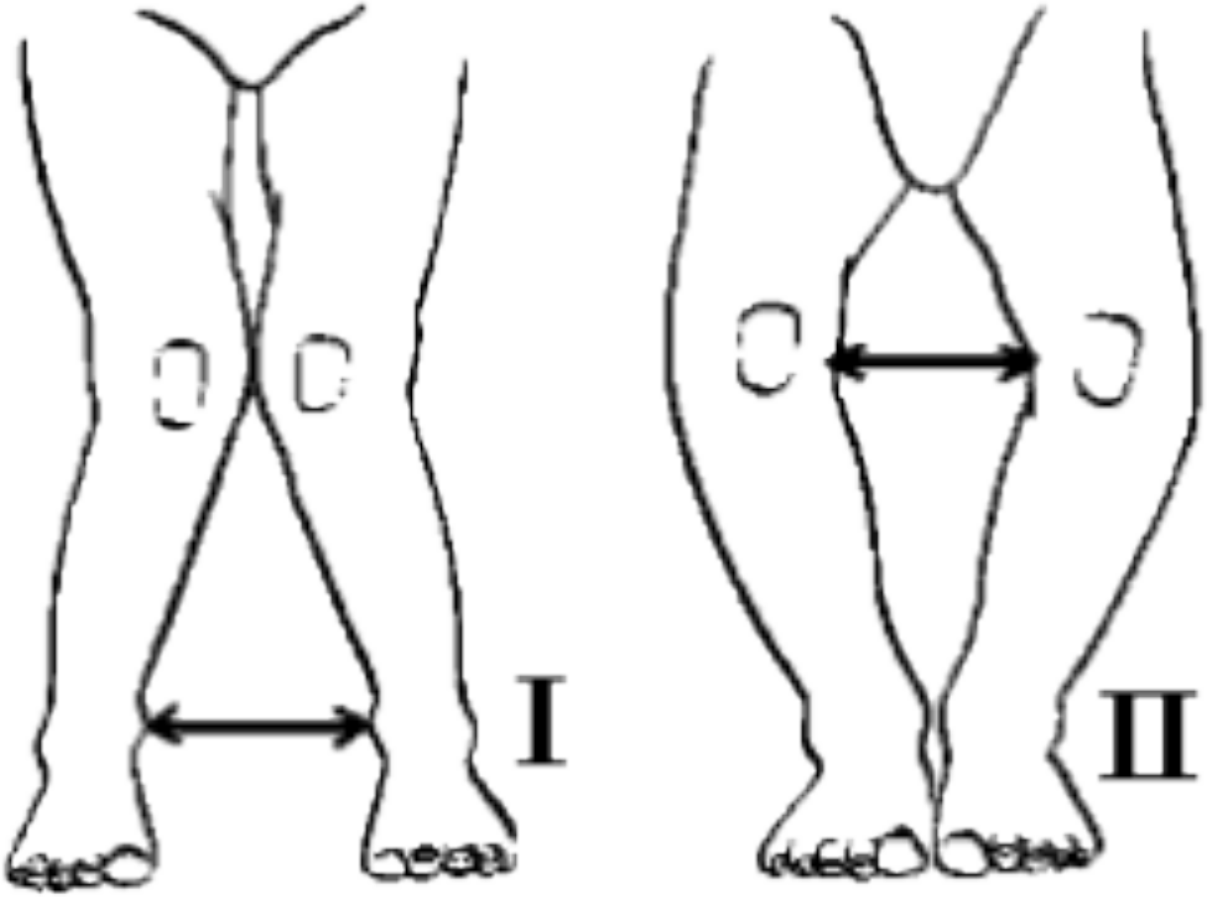

Genu Valgum

Genu Varum

An adolescent female has a right thoracic idiopathic scoliosis. Her rib prominence is most obvious upon her bending forward. The radiograph demonstrates a right thoracic scoliosis

Developmental changes: Elderly

- Osteoporosis in the elderly
- Postural changes and loss of height occur in elderly due to loss of bone, fluid, and thinning of the vertebral disks
- Kyphosis
- Muscle atrophy as age increases
- Functional assessment important –walk, walk up stairs, rise from chair, rise from bed, bend to pick up object.

Developmental considerations: Pregnancy

- Lordosis to compensate for enlarging fetus
- Can experience kyphosis and cervical flexion in 3rd trimester
- Waddling gait due to softening of pelvic ligaments late in pregnancy

A

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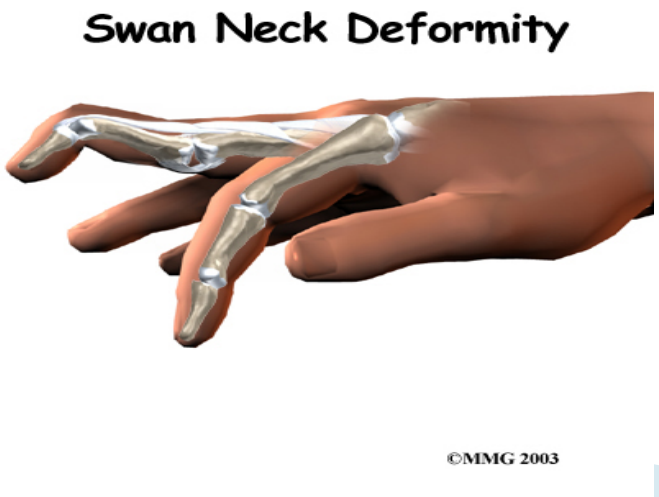
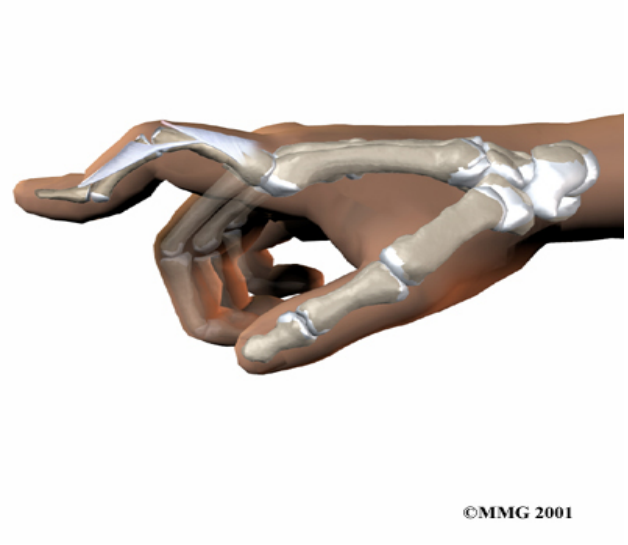
Pathology of MSK

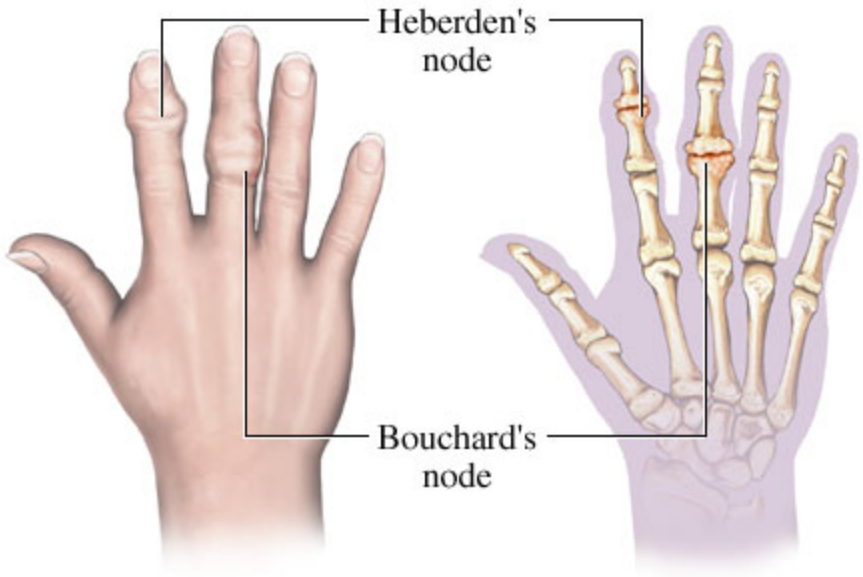
- Rheumatoid Arthritis:
  - Immune disease where joints are attacked
  - Painful, swelling, deformity, loss of function, progressive





Osteoarthritis/ Degenerative Joint disease

- Overuse, “wearing out” of joints
- Often affects hips/shoulders/ fingers



Special Tests

- Phalen's test – +test = carpal tunnel
- Hold position 60 sec
- Numbness
- Tingling
- Burning

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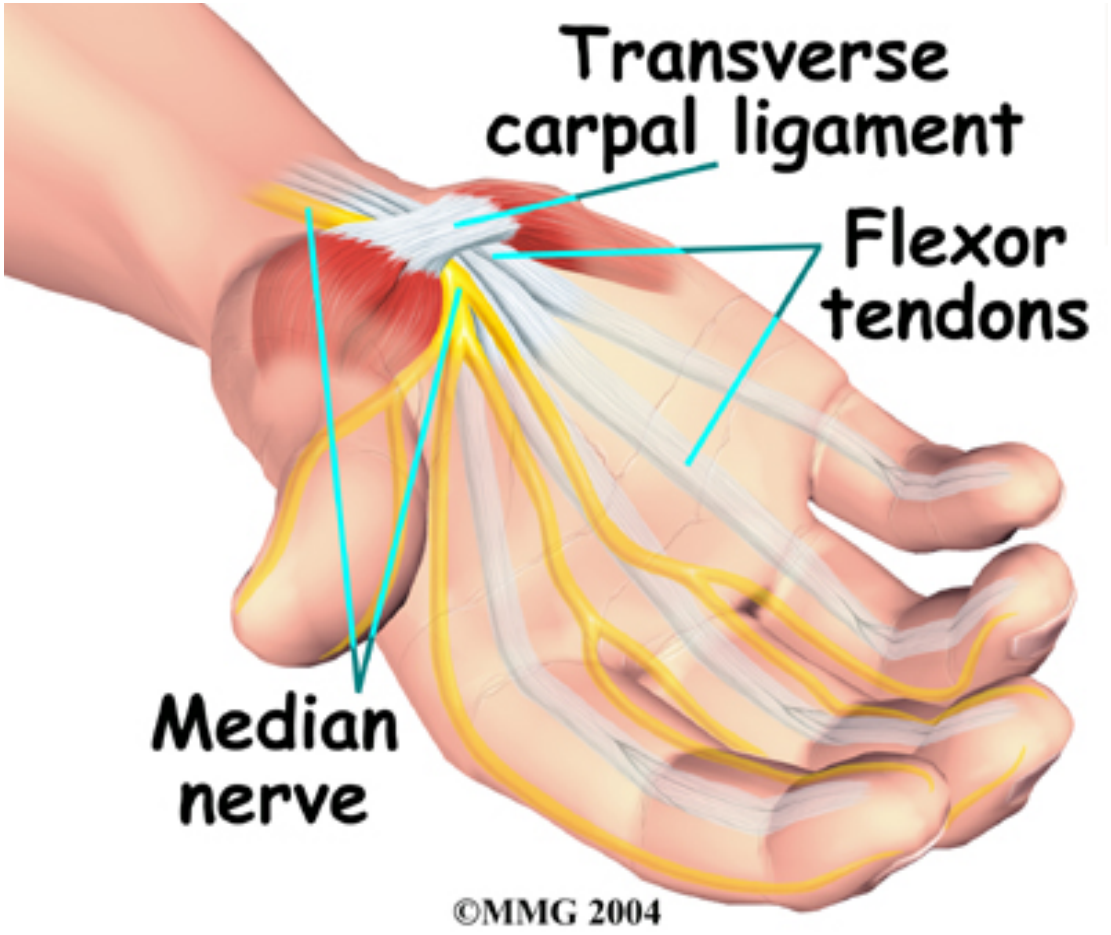
Carpel Tunnel Syndrome



Special Tests

- Tinel's sign – percussion of median nerve produces burning or tingling = carpel tunnel

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Bulge Sign

- Fluid in the knee joint

A

(From Dieppe PA, Cooper C, McGill N: *Arthritis and rheumatism in practice*, London, 1991, Gower Medical Publishing.)

B

(From Dieppe PA, Cooper C, McGill N: *Arthritis and rheumatism in practice*, London, 1991, Gower Medical Publishing.)

Ballottement of patella

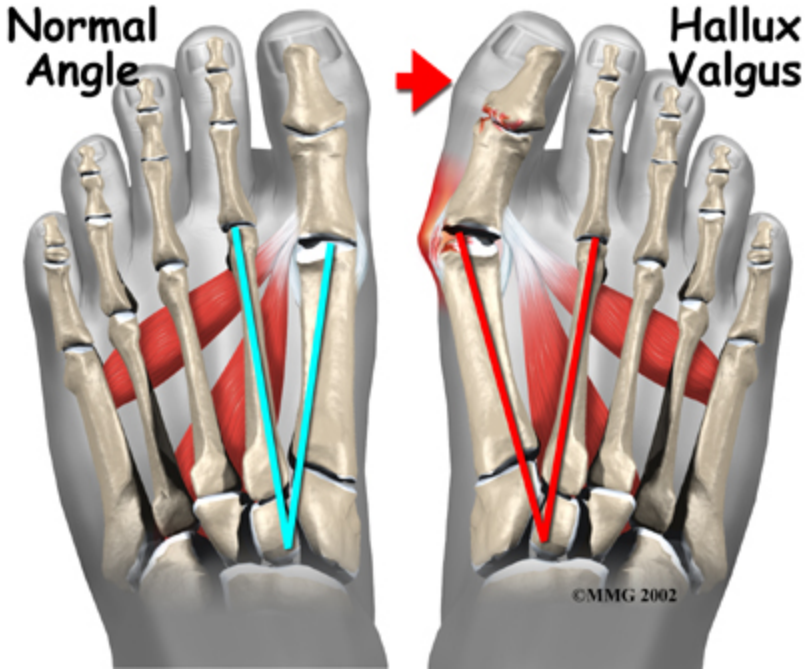
- Detects larger amts of fluid in knee joint

A

(From Dieppe PA, Cooper C, McGill N: *Arthritis and rheumatism in practice*, London, 1991, Gower Medical Publishing.)

B

(From Dieppe PA, Cooper C, McGill N: *Arthritis and rheumatism in practice*, London, 1991, Gower Medical Publishing.)


Normal
Angle
Hallux
Valgus
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