In The Name of God

(A PROJECT OF NEW LIFE COLLEGE OF NURSING KARACHI)

UNIT 06:
Assessment Of Peripheral Vascular &Musculoskeletal system

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Objectives

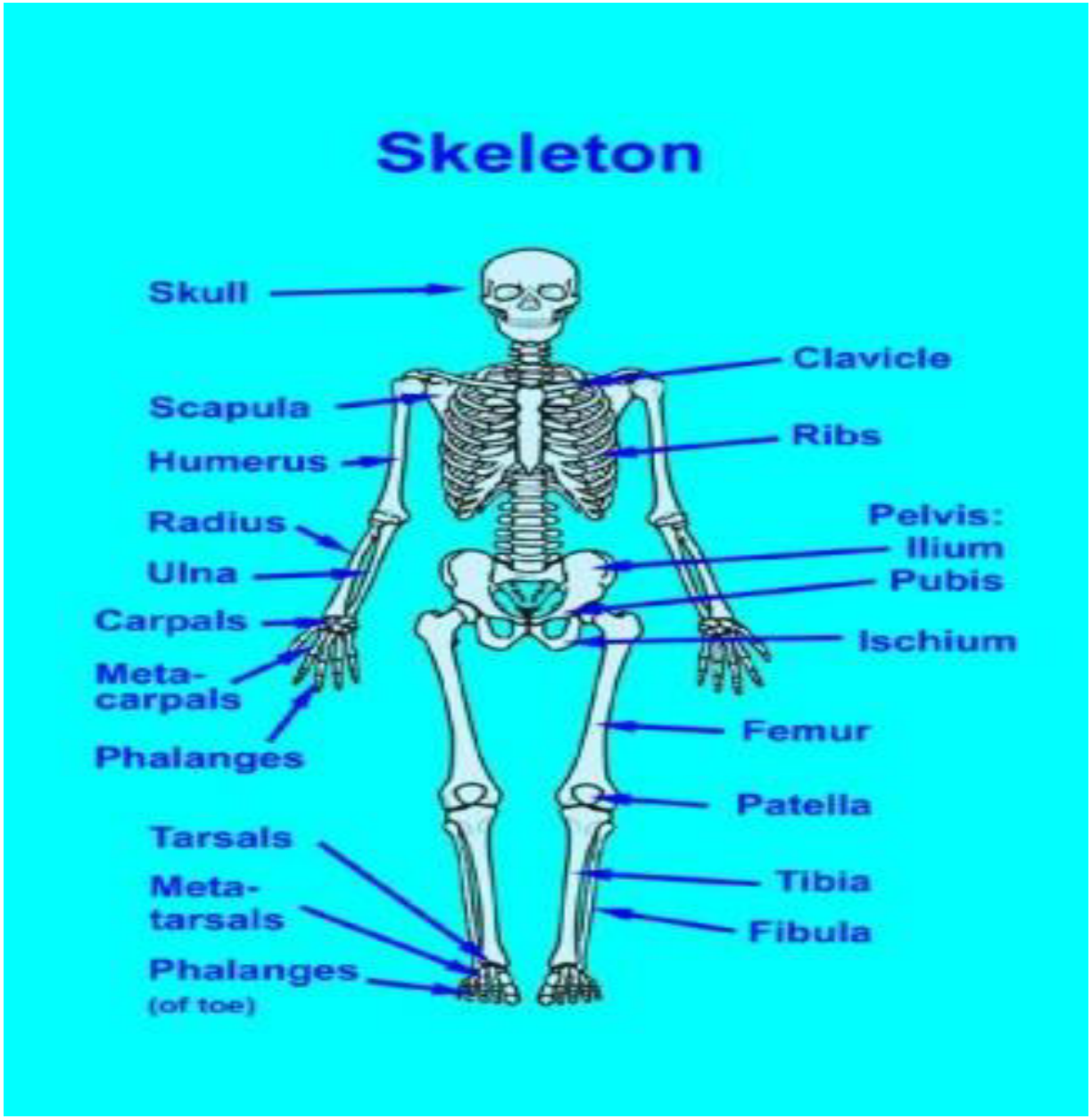
- By the end of the unit, learners will be able to:
-
- Discuss the pertinent health history question necessary to perform the assessment of Peripheral Vascular System (PVS) and Musculoskeletal System (MS) system.
- Discuss critical observations to assess PVS.
- Assess musculo - skeletal functions including muscles strength, symmetry, size, contour, ROM and its characteristics.
- Document findings.
- List the changes in the given systems that are characteristics of aging process

Musculoskeletal: Review Anatomy& Physiology

- Skeleton: 206 bones
- Long: femur, humerus, radius
- Short: carpals, tarsals
- Irregular: vertebrae
- Bones protect, support, allow for locomotion and mineral storage (Ca, Mg)

Structure and Function (cont.)

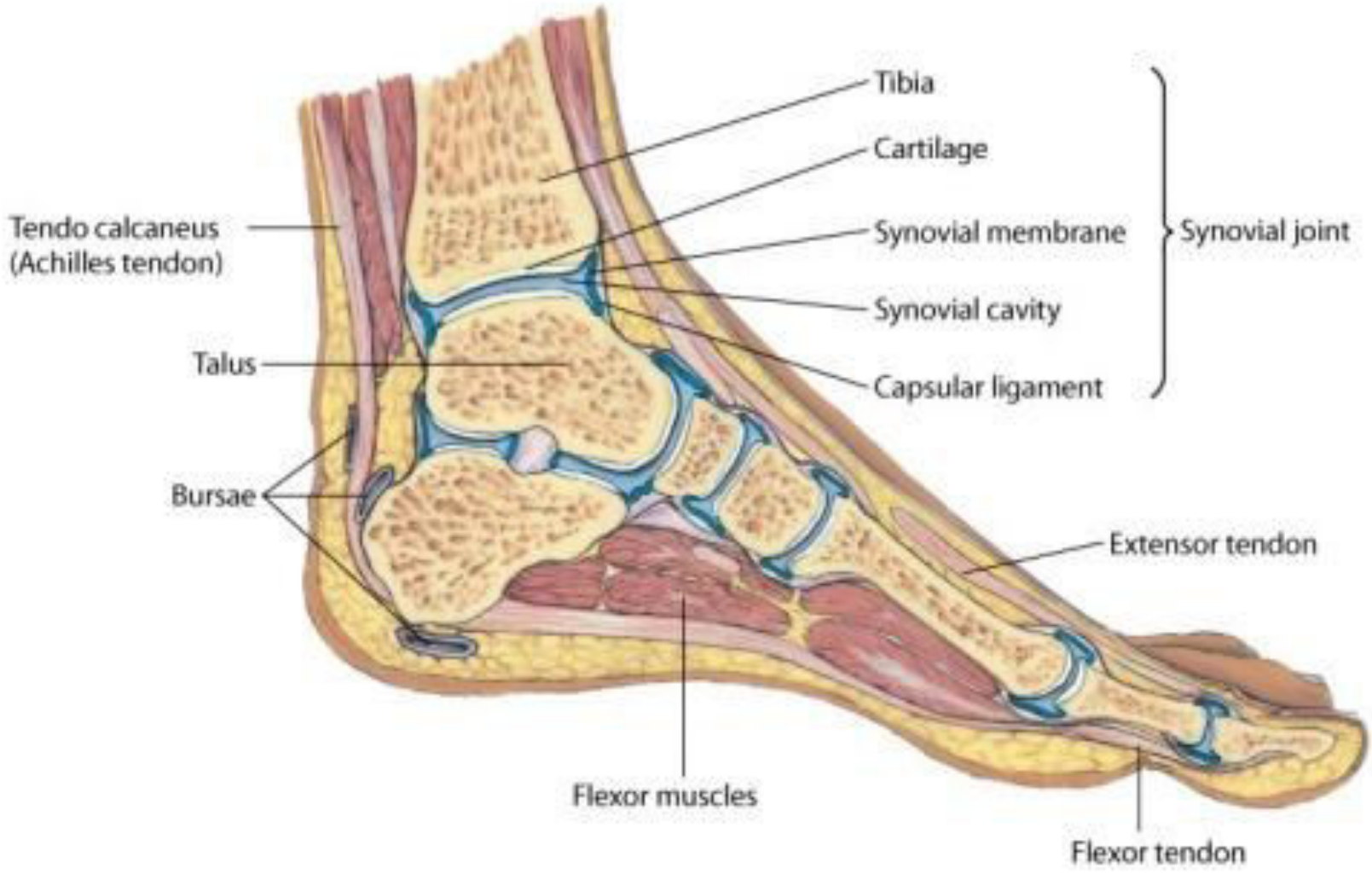
- ***Components of musculoskeletal system:***
- Nonsynovial or synovial joints
- Muscles
- Temporomandibular joint
- Spine
- Shoulder
- Elbow
- Wrist and Carpals
- Hip
- Knee
- Ankle and Foot


Skeleton
Skull
Clavicle
Scapula
Ribs
Humerus
Radius
Pelvis:
Ilium
Ulna
Pubis
Carpals
Ischium
Meta-
carpals
Femur
Phalanges
Patella
Tarsals
Tibia
Meta-
tarsals
Fibula
Phalanges
(of toe)

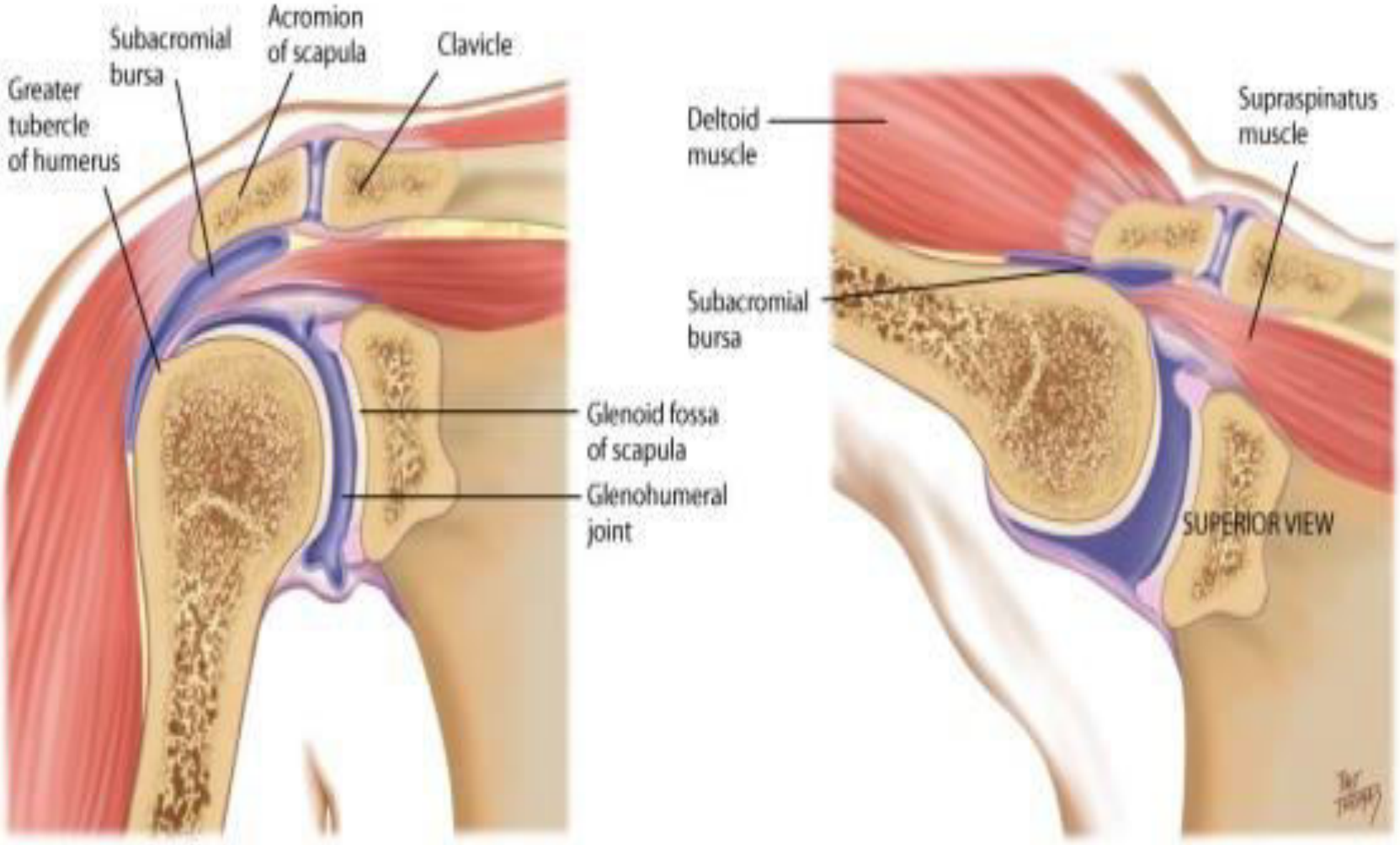
Musculoskeletal

- Joints: Range from joints that don't move to joints that freely move.
- Ligaments and tendons: stabilize joints
- Ligaments: attached from bone to bone
- Tendons: attached from muscle to bone
- Cartilage: ends on bones

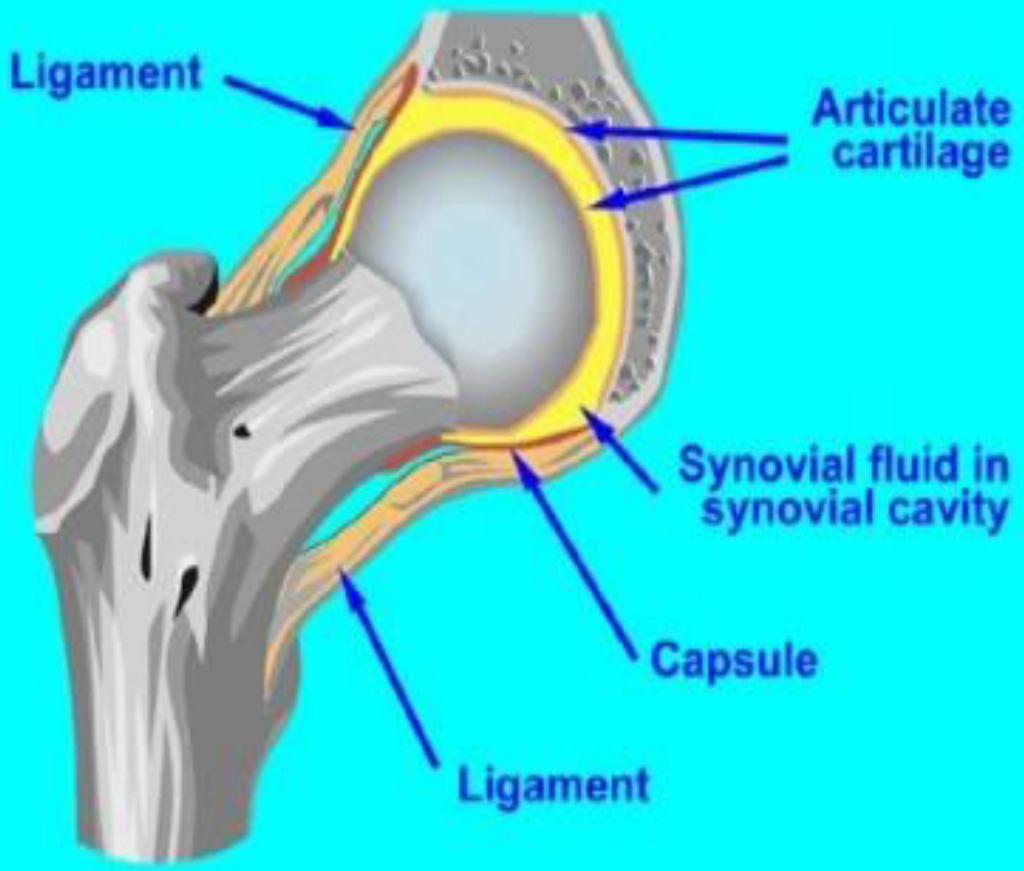
Synovial Joint



Shoulder


Subacromial bursa
Acromion of scapula
Clavicle
Greater tubercle of humerus
Glenoid fossa of scapula
Glenohumeral joint
SHOULDER JOINT
Deltoid muscle
Supraspinatus muscle
Subacromial bursa
SUPERIOR VIEW
SHOULDER WITH ARM ELEVATED

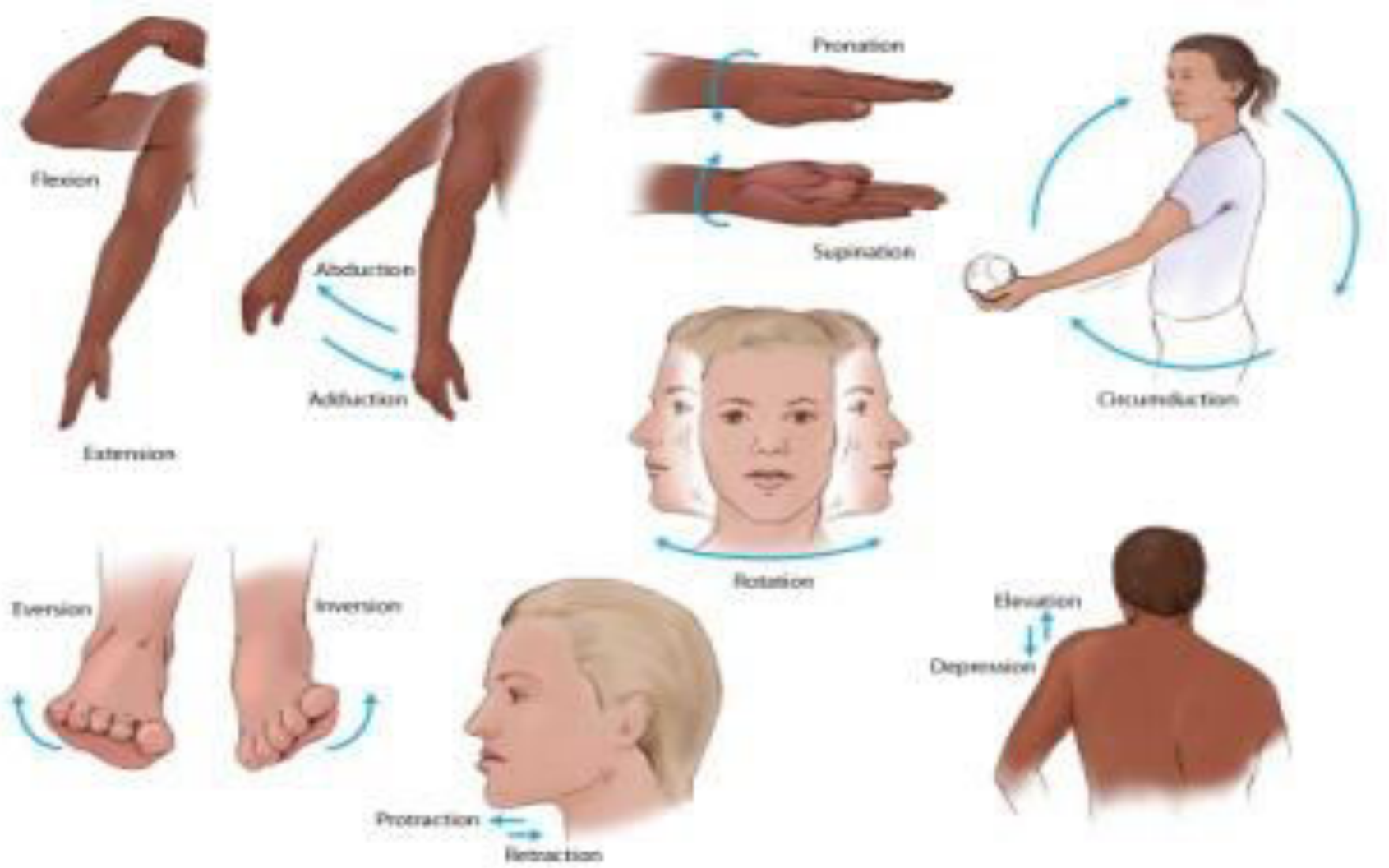
Synovial Joint



Musculoskeletal

- Muscles: controlled by nervous system
- Fascia: surrounds muscles, divides muscles, main blood vessels and nerves.
- Bursae: cushions moving parts
- Muscle tone: ability to resist force; graded 0-5
- Atrophy: decrease size

Skeletal Muscle Movements



SKELETAL MUSCLE MOVEMENTS

Assessing: Subjective Data

- Joint pain:
- **SLIDA:** Severity, Location, Intensity, Duration, Aggravating factors (alleviating factors, associated symptoms)
- Stiffness
- Limited movement

Assessing: Subjective Data

- **Rheumatoid Arthritis (RA)** chronic systemic inflammatory disease involves symmetric joints. Other MS disorders involve isolated or unilateral joints.
  - Rheumatoid arthritis
  - Stiffness
  - Swelling
  - Limited ROM
  - Movement decreases pain

Assessing: Subjective Data

- **Osteoarthritis**: chronic degeneration of joint cartilage caused by aging or trauma
  - Stiffness
  - Swelling
  - Limited ROM
  - Heberden's and Bouchard's nodules

Assessing: Subjective Data

- Muscle Pain:
- SLIDA
- Aching/cramps
- Weakness
- Resistance 0-5
- Atrophy

Assessing: Subjective Data

- Bones pain:
- SLIDA
- Hx
- Deformity
- Trauma- limitations as a result of trauma

Assessing: Subjective Data

- **Functional Assessment:**
- ADL's- does MS problem create limits:
- Bathing- getting in and out of tub, turning faucets
- Toileting- getting on/off toilet, wiping self
- Dressing- buttons, zippers, tying shoes
- Grooming- shaving, brushing teeth, putting on makeup
- Eating- cutting food, preparing meals etc…

Assessing: Subjective Data

- **Functional Assessment:**
- Mobility- walking up/down stairs, in and out of car, out of house
- Communicating- talking, using phone or computer, writing
- Occupational/Environmental- heavy lifting, repetitive motions etc.

Assessing: Subjective Data

- **Self care behaviors:**
- Exercise- type, frequency, warm up
- Pain during exercise? How tx?
- Recent weight gain (puts stress on musculoskeletal system) …usual daily diet
- Any meds- anti inflammatory, muscle relaxants, pain relievers

Assessing: Subjective Data

- **Additional hx.- Infants and Children:**
- Birth trauma
- Resuscitation at birth
- Motor milestones
- Bone deformity/spinal curvature

Assessing: Subjective Data

- **Additional hx. for Adolescents:**
- Sports (Assess safety)
- Special equipment? Training? Warm up?
- What does client do if injured/ ill
- How does sport fit in with other demands/ activities

Assessing: Subjective Data

- **Additional hx. for Aging adult:**
- Use functional assessment to elicit any loss of function, self care deficit or safety risk:
- Weakness
- Falls/ Stumbling
- Mobility aids used

Assessing: Objective Data

- **Physical exam** provides the nurse with objective data
- Guidelines for Physical Exam include:
- Full visualization of part being examined
- Drape other parts for privacy
- Orderly approach: head to toe and proximal to distal.

Physical Examination Guidelines

- Joint being examined should be supported.
- Compare paired joints, expect symmetry.
- When examining a painful area, use firm support, gentle movement.
- Assess Range of Motion (ROM) of each joint

Physical Examination

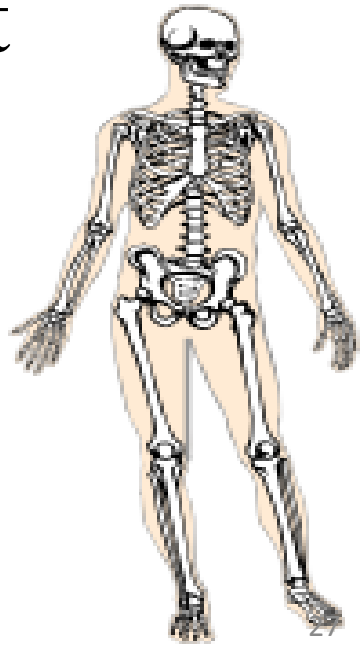
- Assess gross motor movement and posture
- Note patient's gait
- Note any foot dragging, limping, shuffling
- Note any spinal deformities
- Inspect skin and subcutaneous tissues

Physical Examination

- Assess upper and lower extremities for:
- Overall size, symmetry
- Gross deformity
- Bony enlargement
- Alignment
- Symmetry of length and position

Physical Examination

- **Bones, joints, muscles**:
- Inspect swelling, deformity, condition
- Assess for stiffness, instability, pain, crepitus, unusual joint movement
- Assess ROM
- Muscle strength
- Assess symmetry



Physical Examination

- **Head**
- Temporomandibular Joint- crepitus and pain with TMJ disorder
- Open mouth: 3-6 cm
- Move lower jaw from side to side
- Stick out lower jaw

Physical Examination

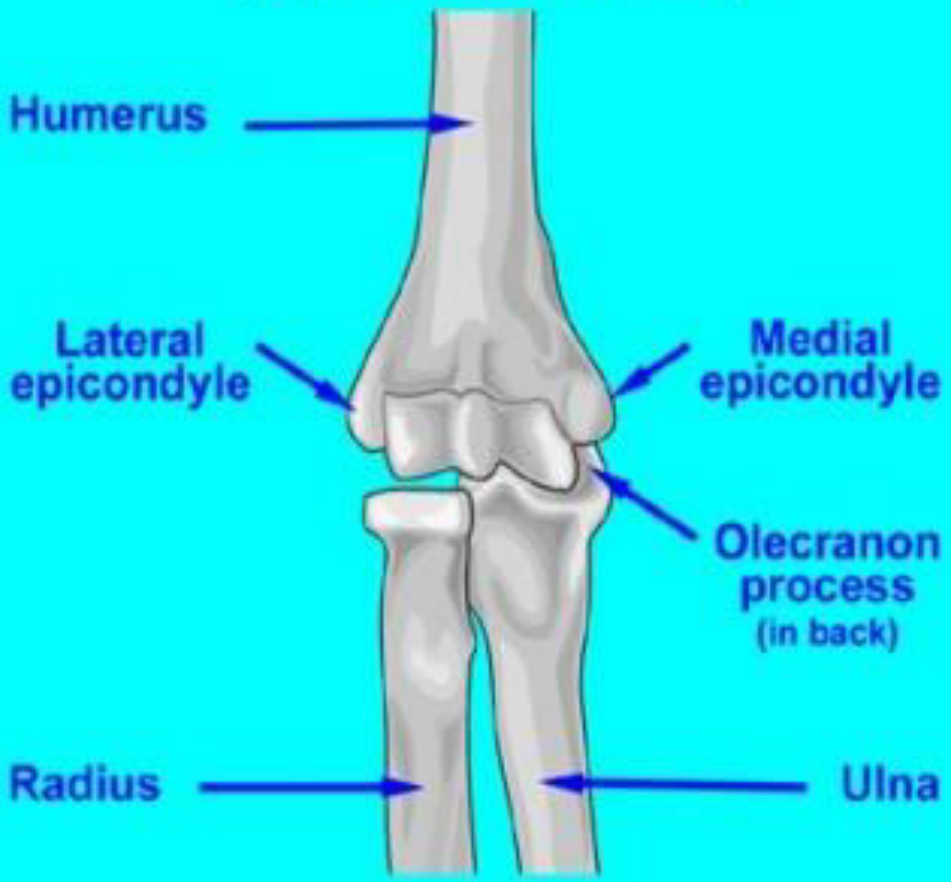
- **Neck**:
- ROM and muscle strength:
- Flexion- touch chin to chest
- Extension- tilt head backward
- Cervical rotation- turn head to R and L.
- Lateral bending- touch ear to R. and L. shoulders
- Retraction and Protraction

Physical Examination

- **Shoulder:** Note posture erect, hunched.
- Assess symmetry and position of clavicles.
- Palpate clavicles toward shoulders, palpate deltoid muscle.
- ROM and muscle strength:
- Flexion and Extension and Hyperextension
- Abduction and Adduction
- Rotation

Elbow Anatomy

(Right Anterior View)



Physical Examination

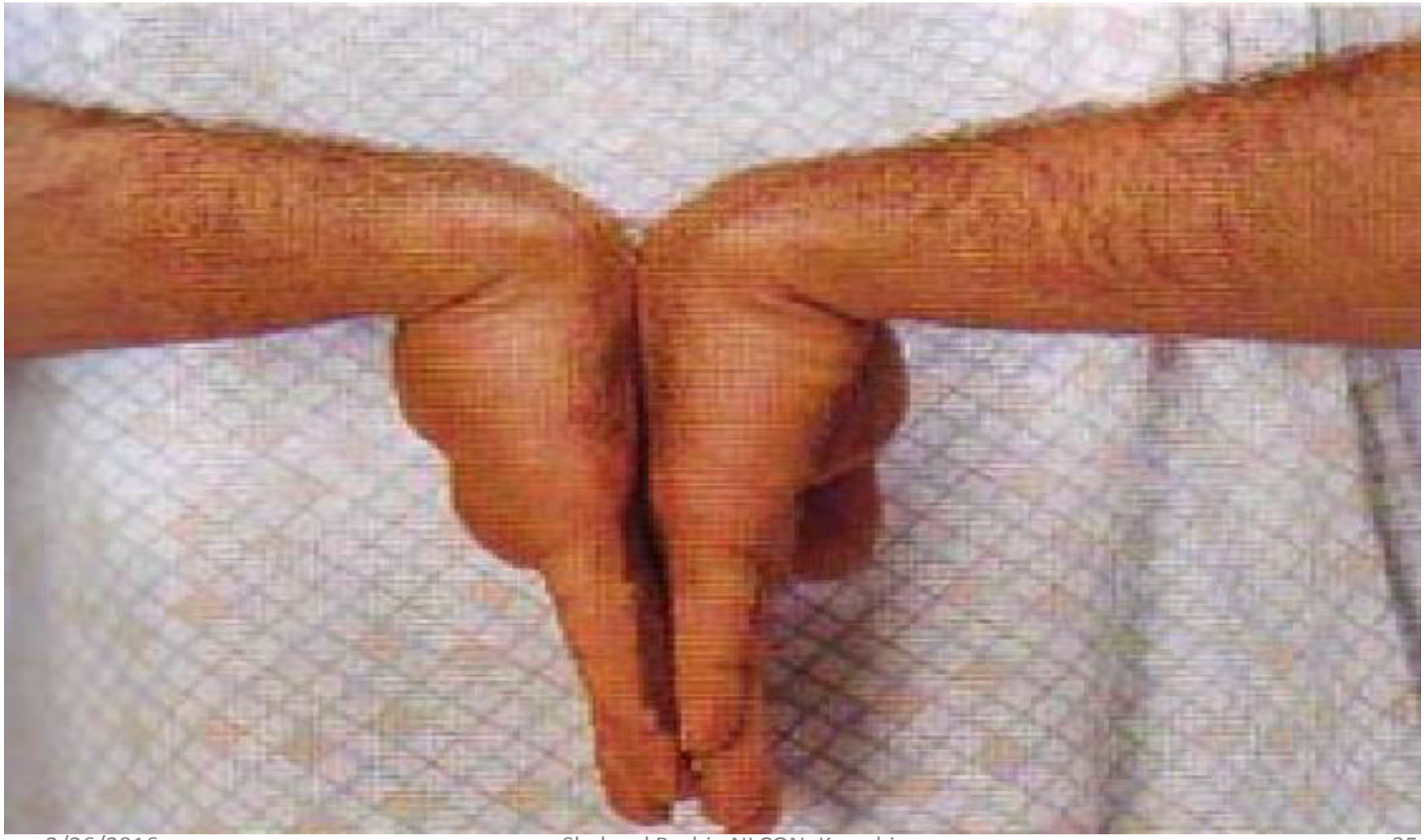
- **Elbow**- bend elbow 70 degrees, inspect and palpate posterior surface
- Note- medial and lateral condyles of humerus and olecranon process of ulna
- ROM and muscle strength:
- Flexion and Extension
- Supination and Pronation

Bones of Hand

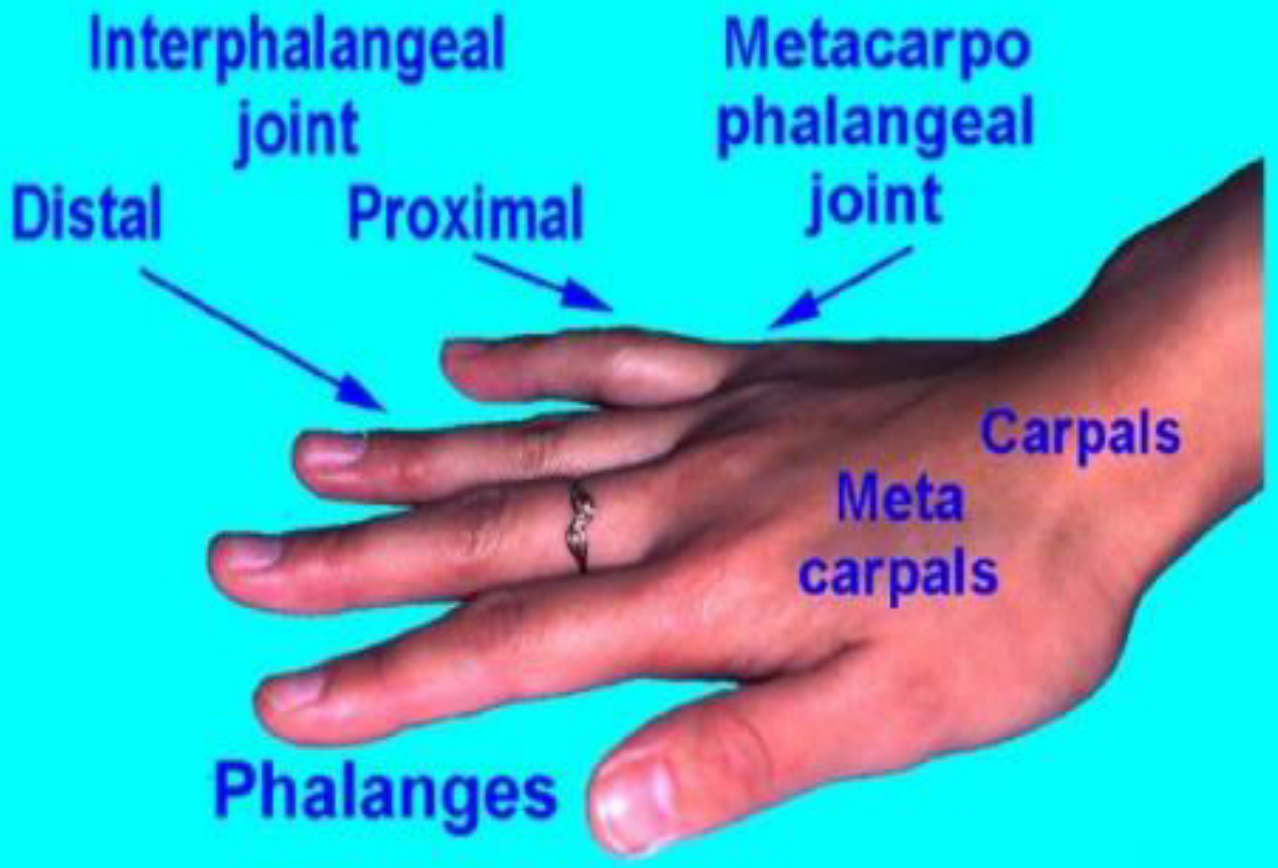
Physical Examination

- **Wrist**- Grasp wrists, assess body processes of radius (thumb side) and the ulna. Palpate radio - carpal joint and remaining wrist joints.
- ROM and muscle strength:
- Flexion and Extension and Hyperextension
- Radial and ulnar wrist deviation
- Circumduction

Phalen's Test



Hand Bones and Joints

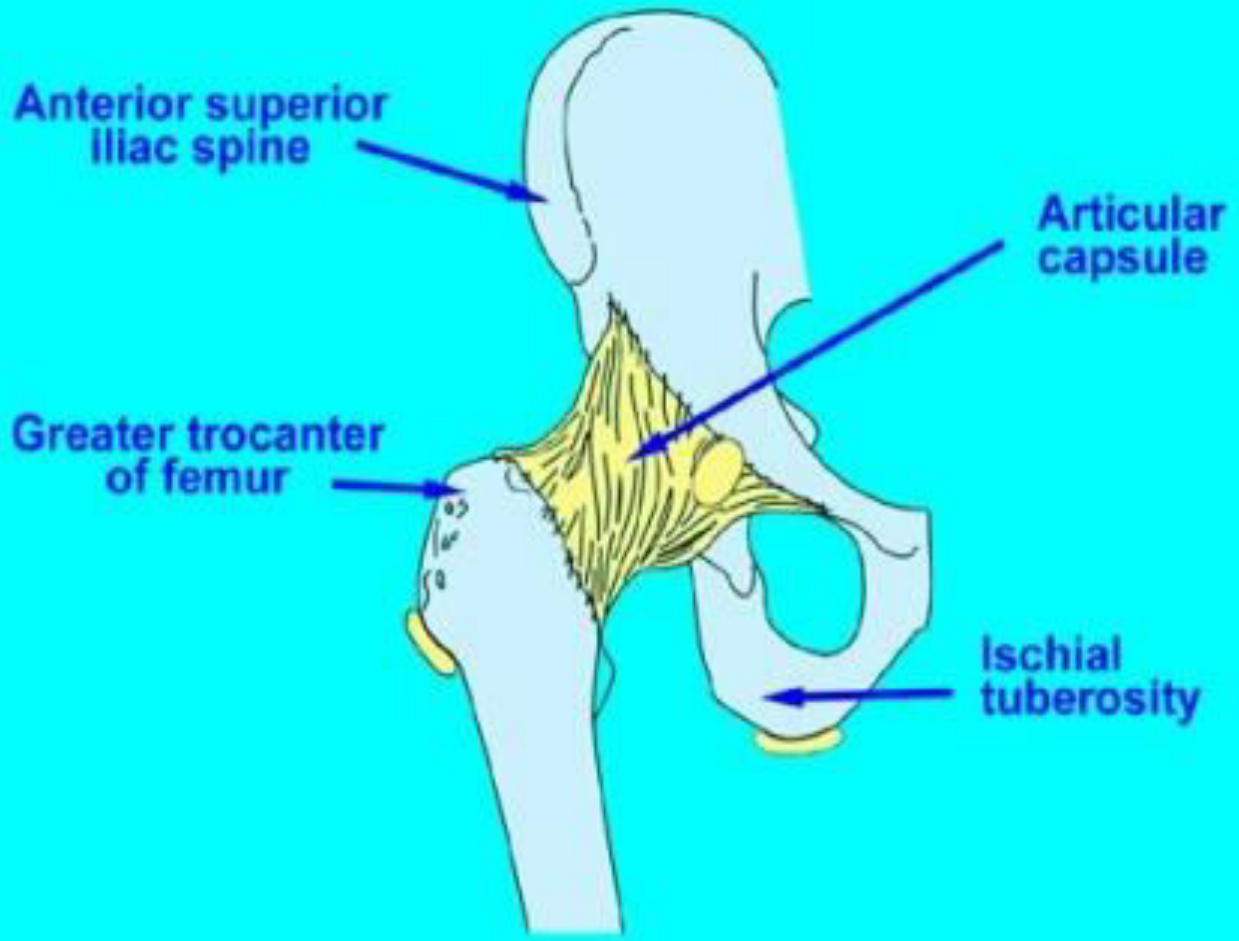


Physical Examination

- **Hand**- Use thumb and forefinger to palpate the metacarpophalangeal and interphalangeal joints.
- ROM and muscle strength:
- Flexion and Extension and Hyperextension
- Abduction- have patient spread fingers apart
- Adduction- have pt. hold fingers together.
- Thumb/Finger Opposition

Arthritis: Heberdens nodules & Bouchards nodules

Hip Anatomy


Anterior superior iliac spine
Articular capsule
Greater trocanter of femur
Ischial tuberosity

Physical Examination

- **Hip**- palpate hip joint and surrounding structures. Position pt. side lying and palpate iliac crest, greater trochanter, hip, thigh and buttock muscles
- ROM and muscle strength:
- Flexion and Extension and Hyperextension
- Adduction and Abduction
- External rotation and Internal rotation

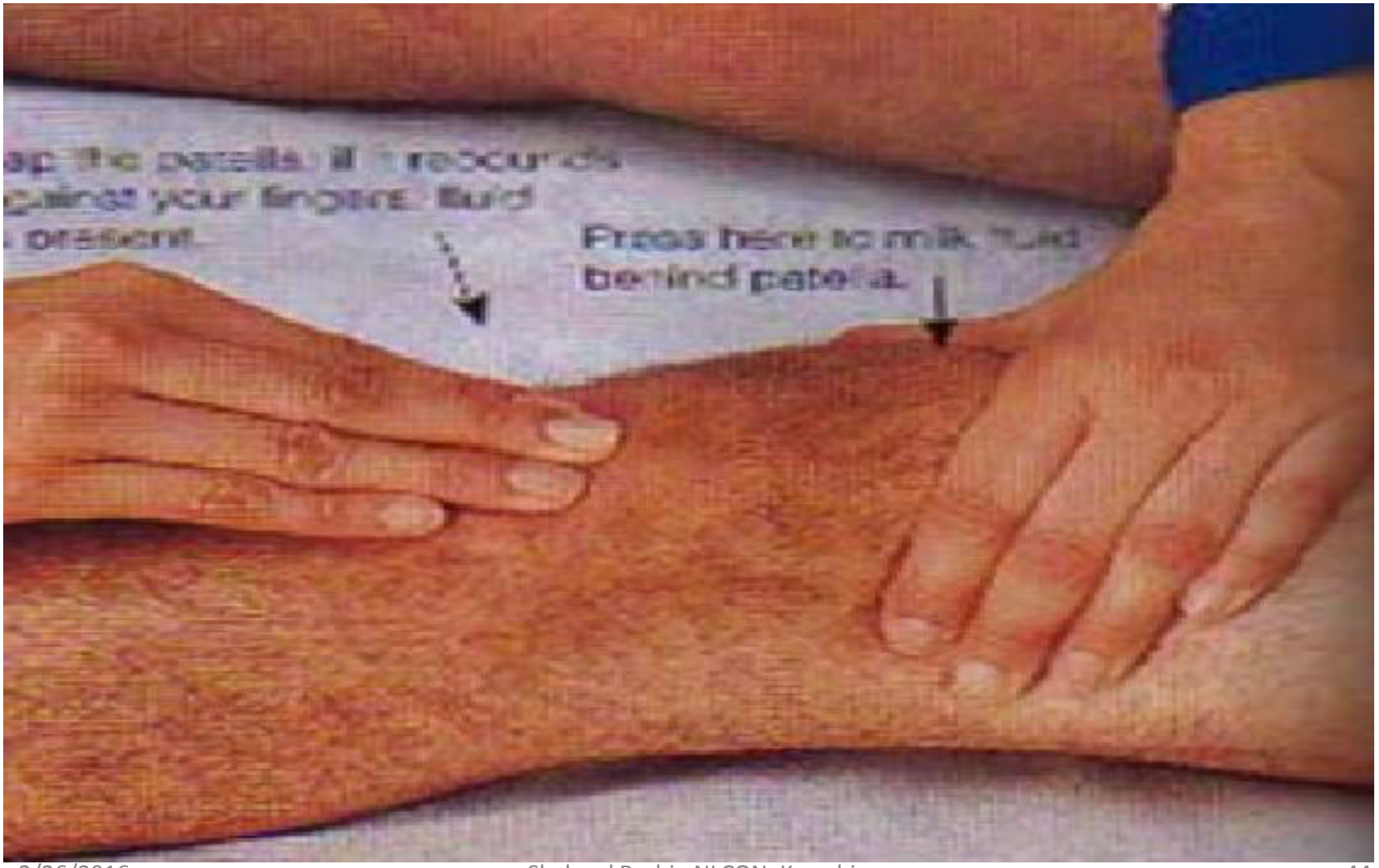
Landmarks of Knee

LANDMARKS OF THE RIGHT KNEE JOINT

Physical Examination

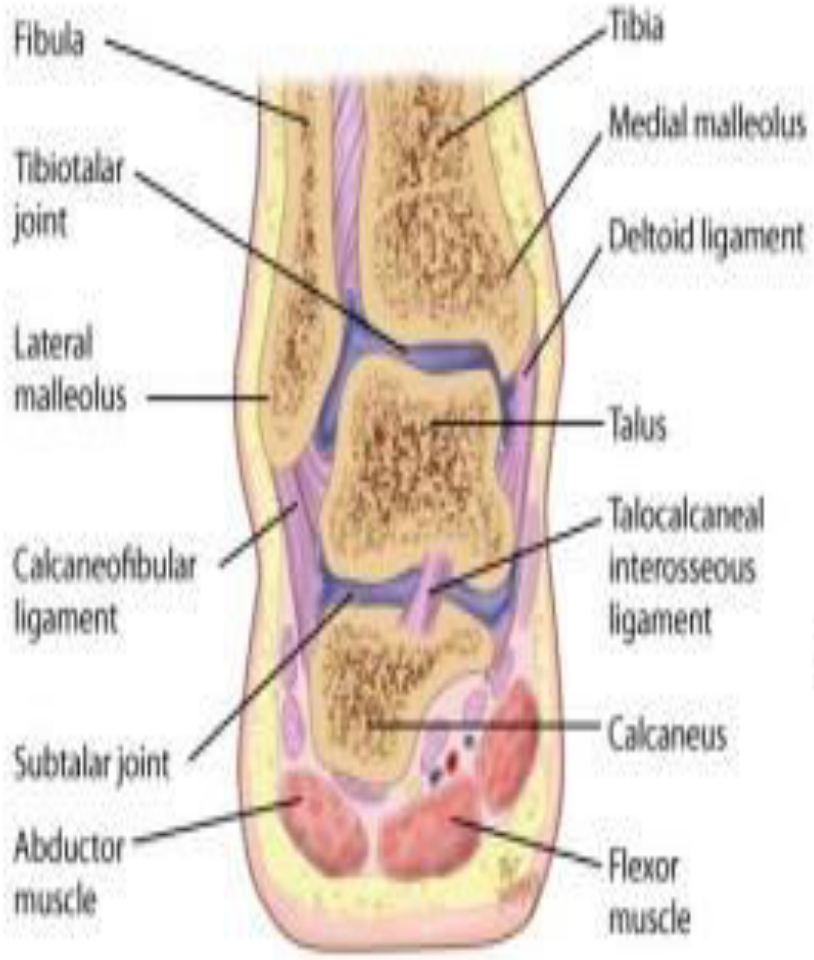
- **Knee-** have pt. sitting, dangling. Inspect- note alignment, deformity, contour of quadricep muscle.
- Palpate the suprapatellar pouch and note any tenderness, edema.
- ROM and muscle strength:
- Flexion and Extension

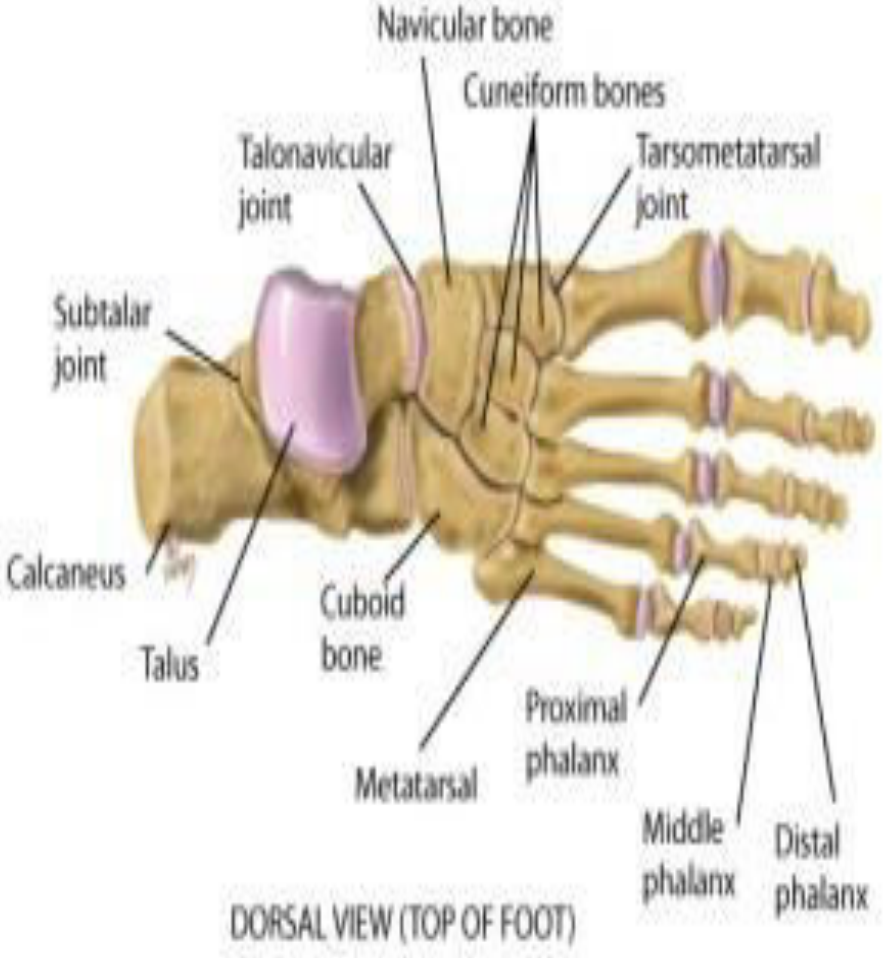
Patella ballottement



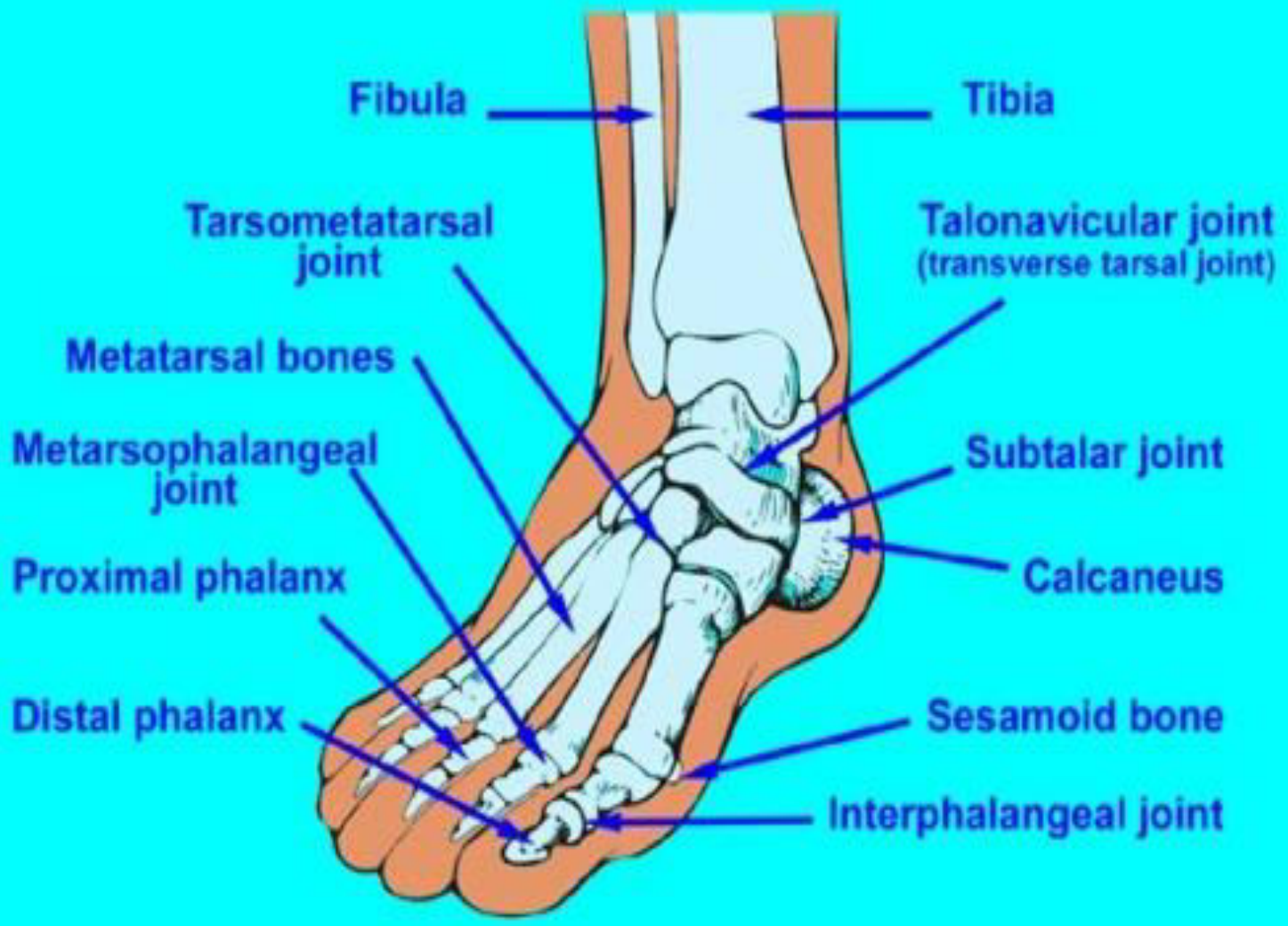
Bulge sign

Ankle and Foot





Foot and Ankle Anatomy



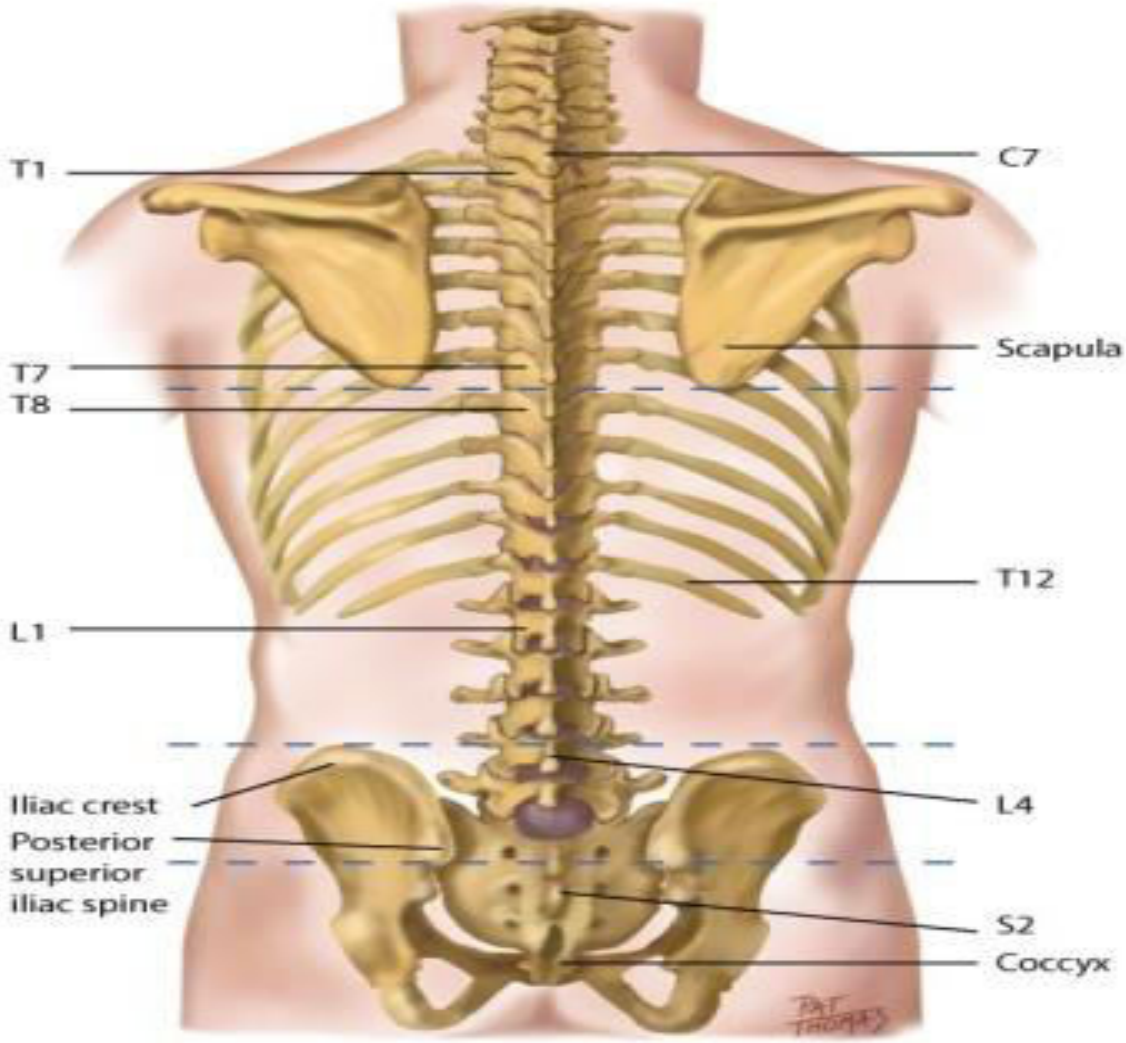
Physical Examination

- **Ankle:** Compare the contour of R. and L. ankles. Palpate ankle and achilles tendons.
- ROM and muscle strength:
- Dorsiflexion- point toes upward.
- Plantar Flexion- point toes downward.
- Inversion- turn soles of feet inward.
- Eversion- turn soles of feet outward.
- Circumduction

Physical Examination

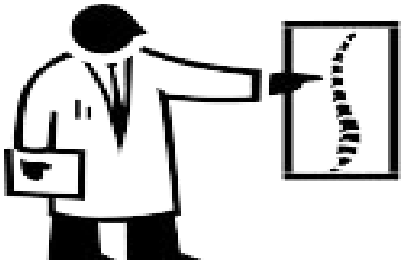
- **Foot:** inspect skin integrity, condition of nails and any deformities.
- Palpate the metatarsal bones and joints, squeeze each foot.
- ROM and muscle strength:
- Flexion and Extension
- Abduction and Adduction

Landmarks of Spine



Physical Examination

- **Spine**: Have pt. bend a waist, note curvature, ease of mobility.



- Palpate vertebral column with fingertips, note tenderness or bony deformities.
- Lightly fist palpate length of spine (ulnar surface of hand) Note any tenderness.
- Lateral bending and spinal rotation.

Summary Musculoskelatal Exam

- Inspect body parts
- Palpate each joint
- Assess ROM of each joint
- Assess muscle strength

Sample Charting

- SUBJECTIVE

- States no joint pain, stiffness, swelling, or limitation. No muscle pain or weakness. No history of bone trauma or deformity. Able to manage all usual daily activities with no physical limitations. Occupation involves no musculoskeletal risk factors. Exercise pattern is brisk walk 1 mile 5x/week.

- OBJECTIVE

- Joints and muscles symmetric; no swelling, masses, deformity; normal spinal curvature. No tenderness to palpation of joints; no heat, swelling, or masses. Full ROM; movement smooth, no crepitance, no tenderness. Muscle strength—able to maintain flexion against resistance and without tenderness.

- ASSESSEMENT

- Muscles and joints appear healthy and functional.

References

1. Bickley, L. S., Szilagyi, P. G., & Bates, B. (2007). *Bates' guide to physical examination and history taking (11th Edi)*. Philadelphia: Lippincott Williams & Wilkins. Chapter No.06 & 07 p.n 171-250

2. Weber, *Kelley's*. (2007). *Health Assessment in Nursing, 3rd Ed:* North American Edition. Lippincott Williams & Wilkins. Chapter No.14 &15 p.n 239-294