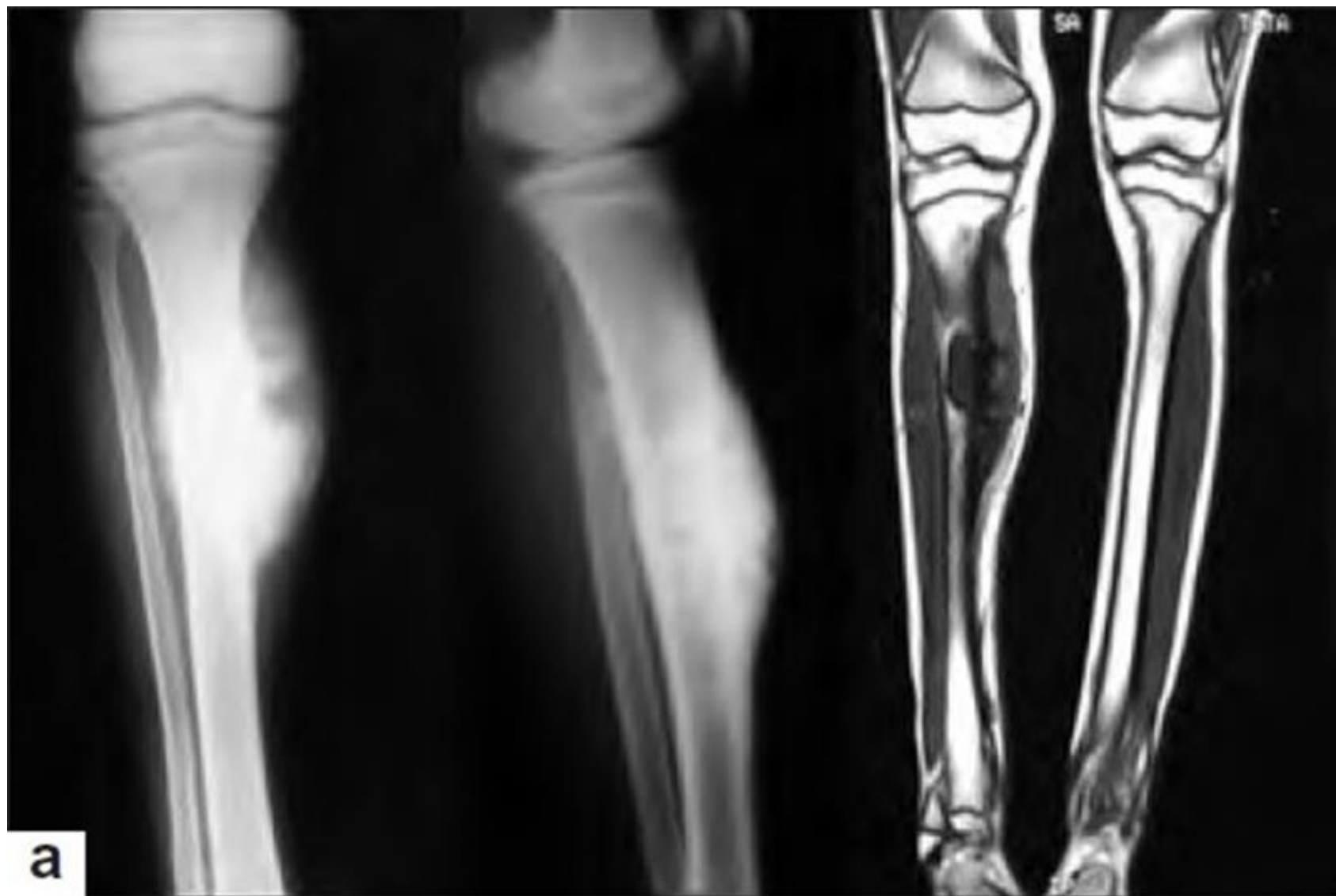


Radiological Anatomy of Lower Limb

- › A 25-year-old male presented with increasing pain in the right upper calf for approximately 3 months' duration and a recent onset of low-grade fever.
- › On physical examination, there was some local tenderness and soft tissue swelling over the proximal and mid thirds of the calf

π



Diagnosis : Ewings Sarcoma

What are the radiological modalities to investigate lower limb?

- Plain radiographs
- Ultrasound scan
- CT
- MRI
- Arthrograms
- Bone scans
- Angiograms



As a doctor

- “What radiological modalities should I use for this particular problem”

is frequently asked question in clinical practice

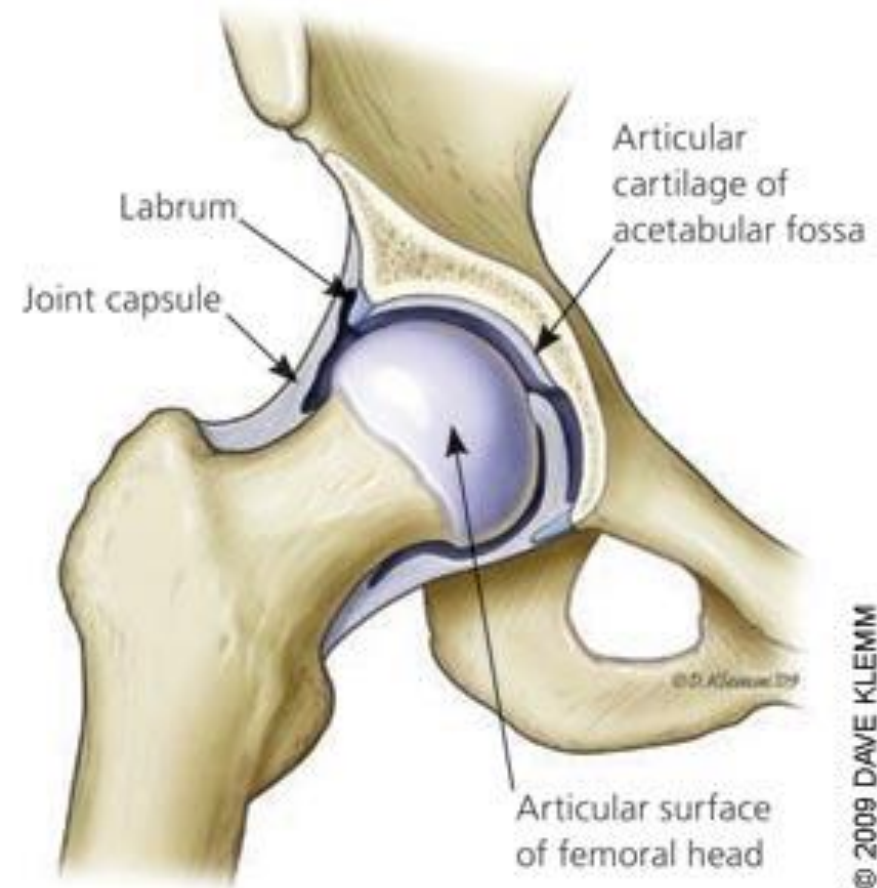


Leisure time reading material.....



Radiological investigations of hip joint.....

- The **hip joint** is a synovial joint
- ball and socket joint
- Between the femoral head and the acetabulum of the pelvis.



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Radiological investigations of hip joint

- **X Ray**
- **USS**
- **CT**
- **MRI**
- **Arthrograms**
- **Bone scans**

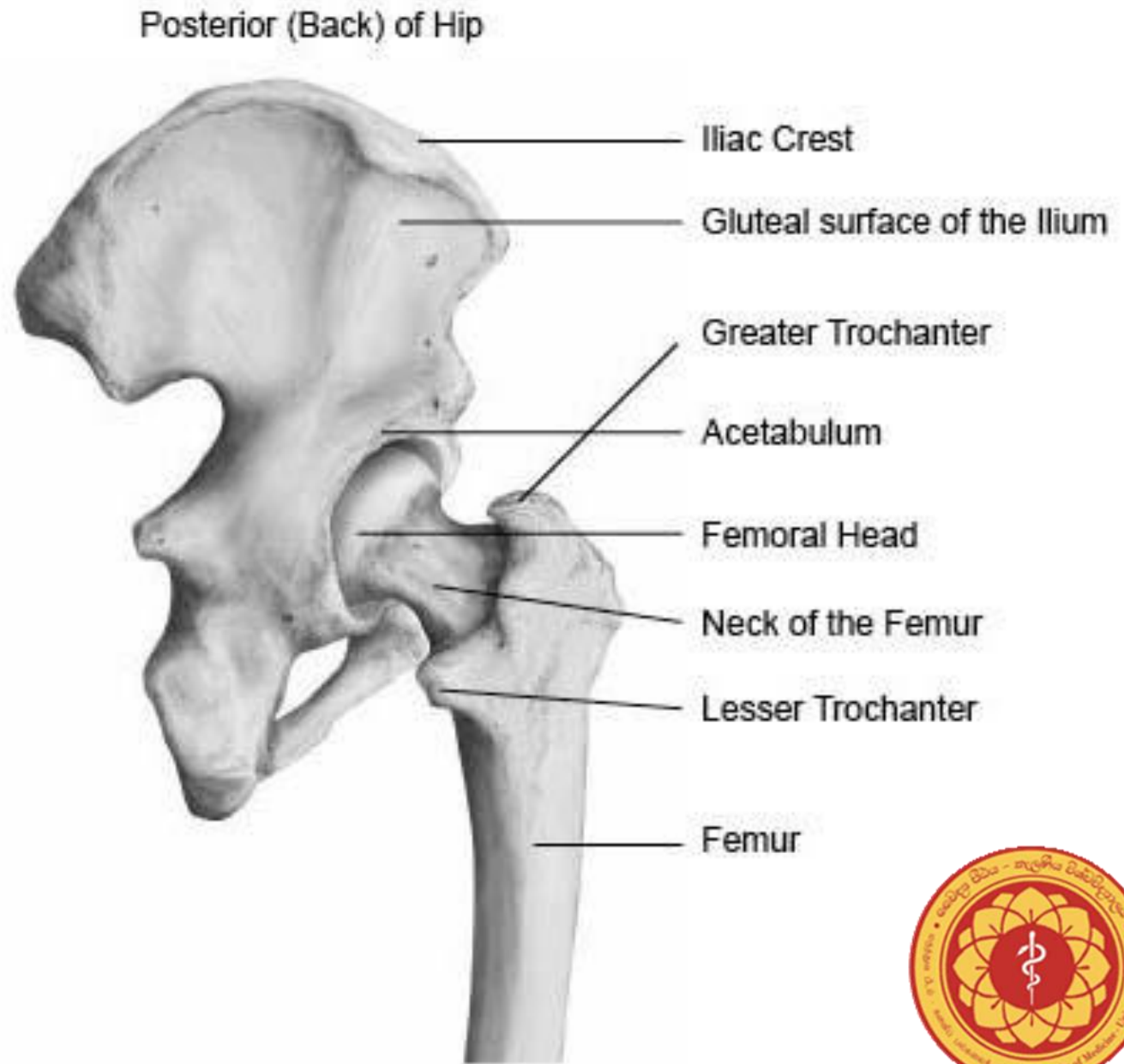
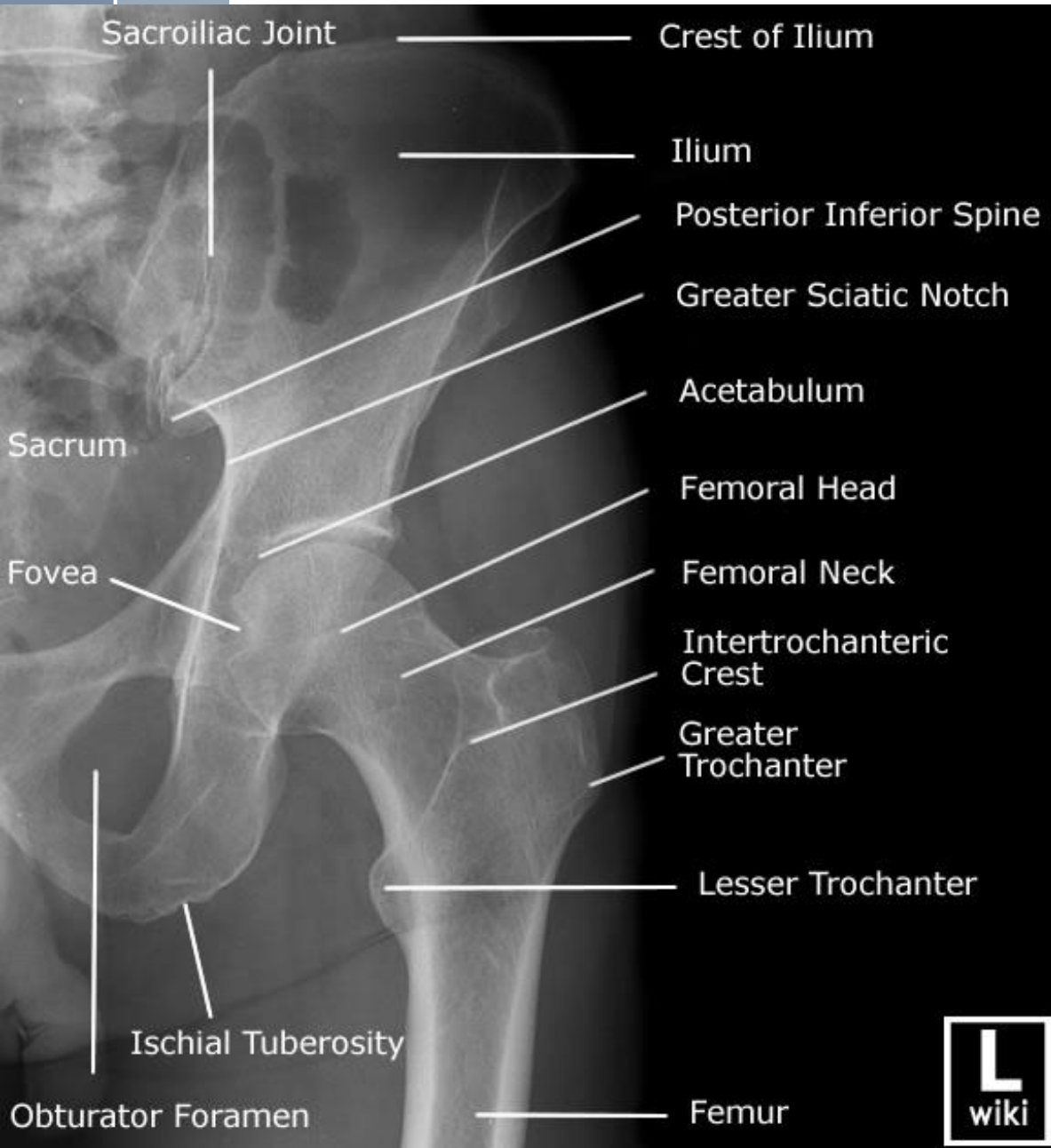


Common plain X Ray views

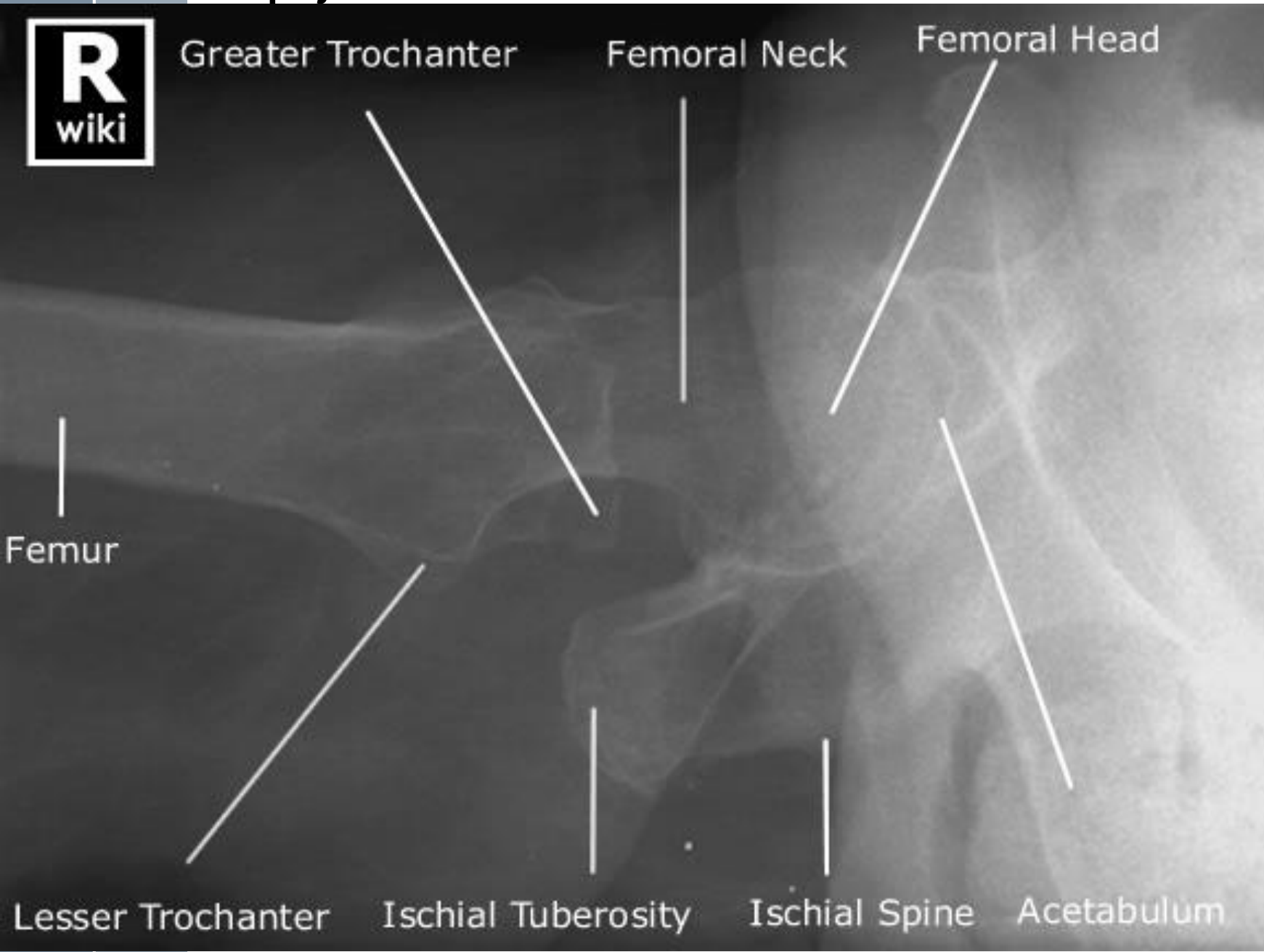
- › AP
- › Lateral - Horizontal Ray
- › Frog lateral



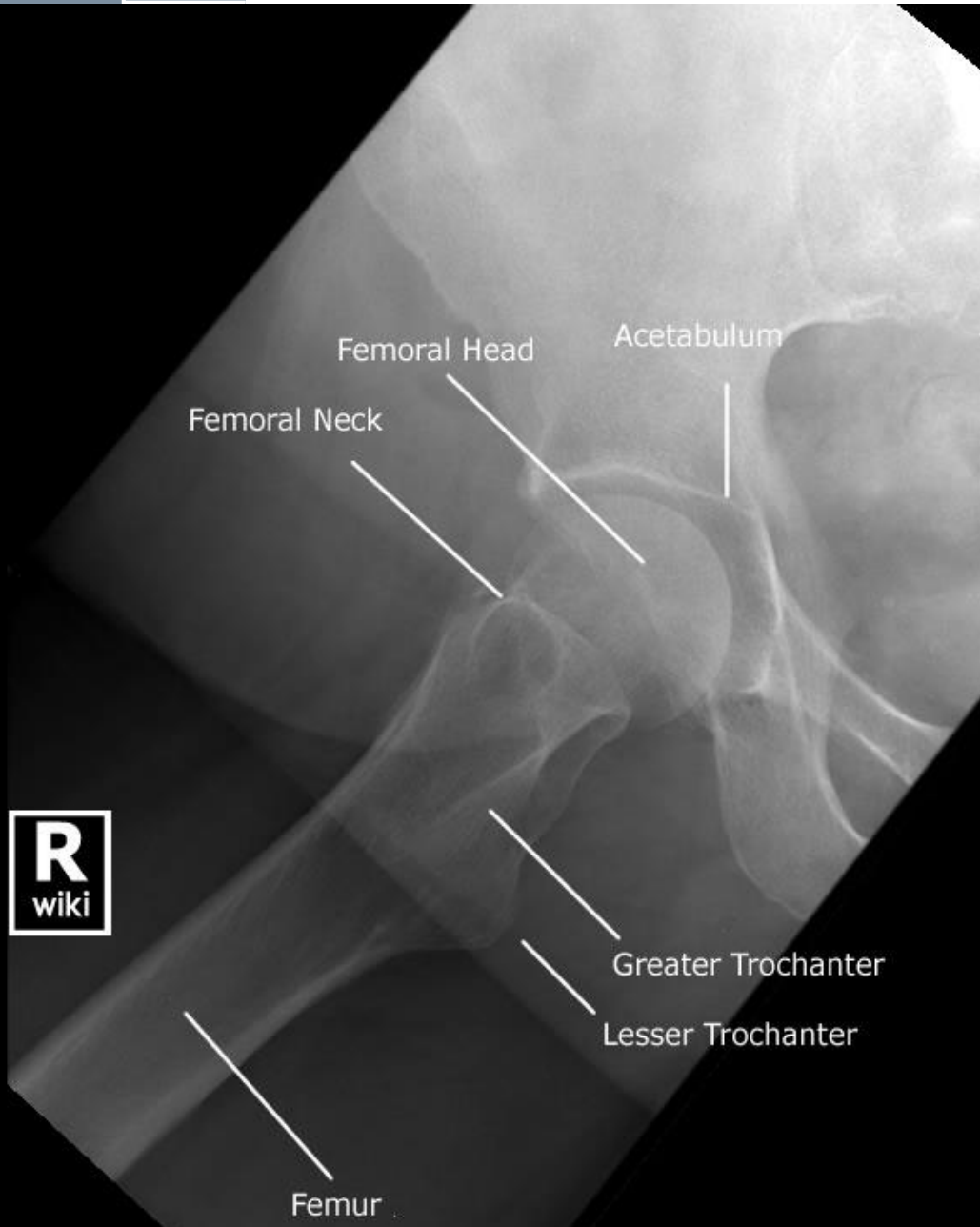
Hip joint -AP



Hip joint -Lateral



Frog Lateral view



- Do not order a frog leg lateral in any patient suspected of having hip fracture or dislocation
- The hip joints and femoral necks are better visualised
- Important in assessment of:
 - Perthes disease



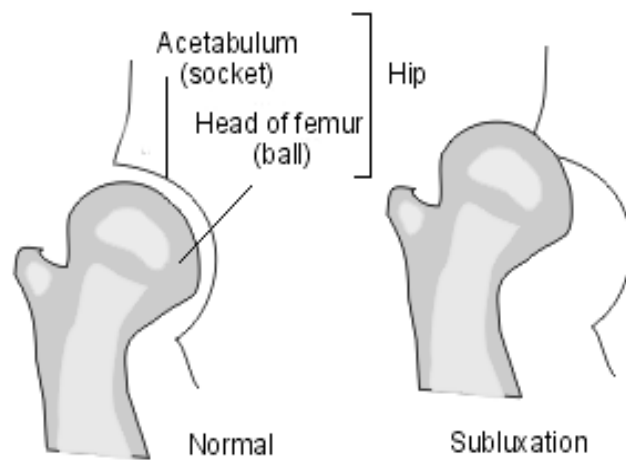
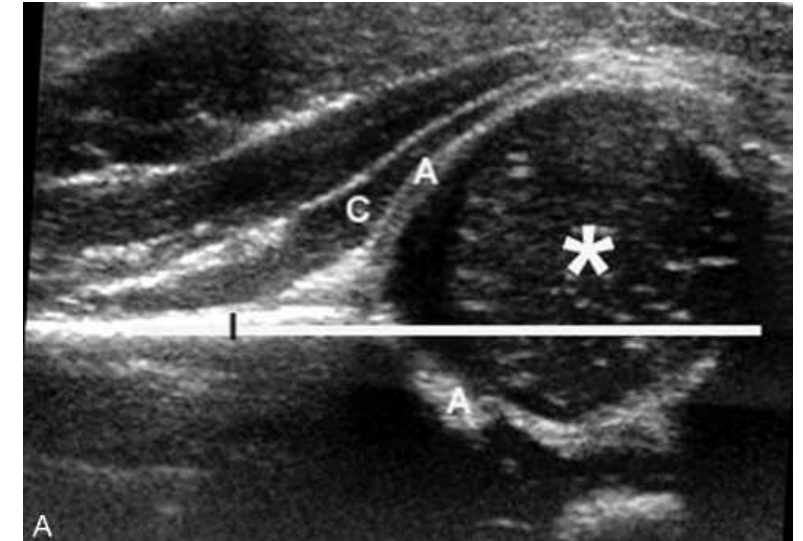
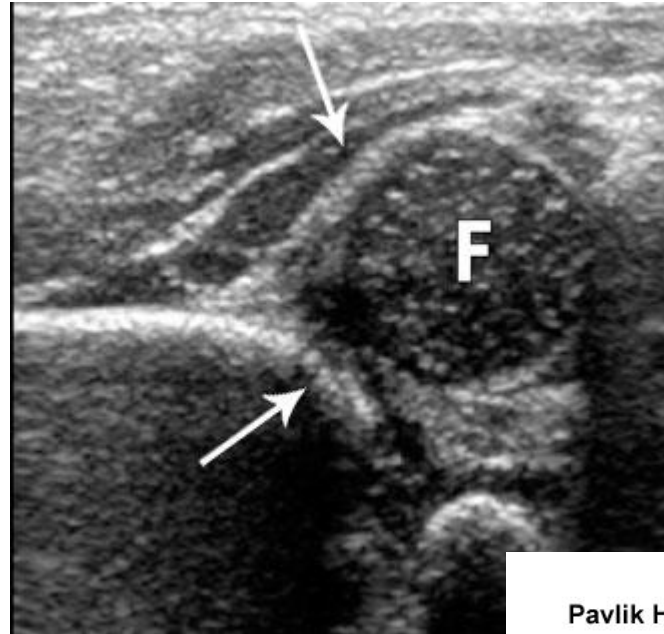
Ultrasound of hip joint

π

- Abnormalities of the muscles, such as tears and soft-tissue masses.
- Bleeding, infections or other types of fluid collections.
- Benign and malignant soft tissue tumors.
- Early changes of arthritis.
- Infant ultrasound -can check the hips for developmental dysplasia of the hip (DDH),
- Ultrasound on infants can be done up to approximately six months of age.

Ultrasound of hip joint

π



Pavlik Harness



X Ray Hip joint -AP

π



X Ray Hip joint -AP

π



Infant

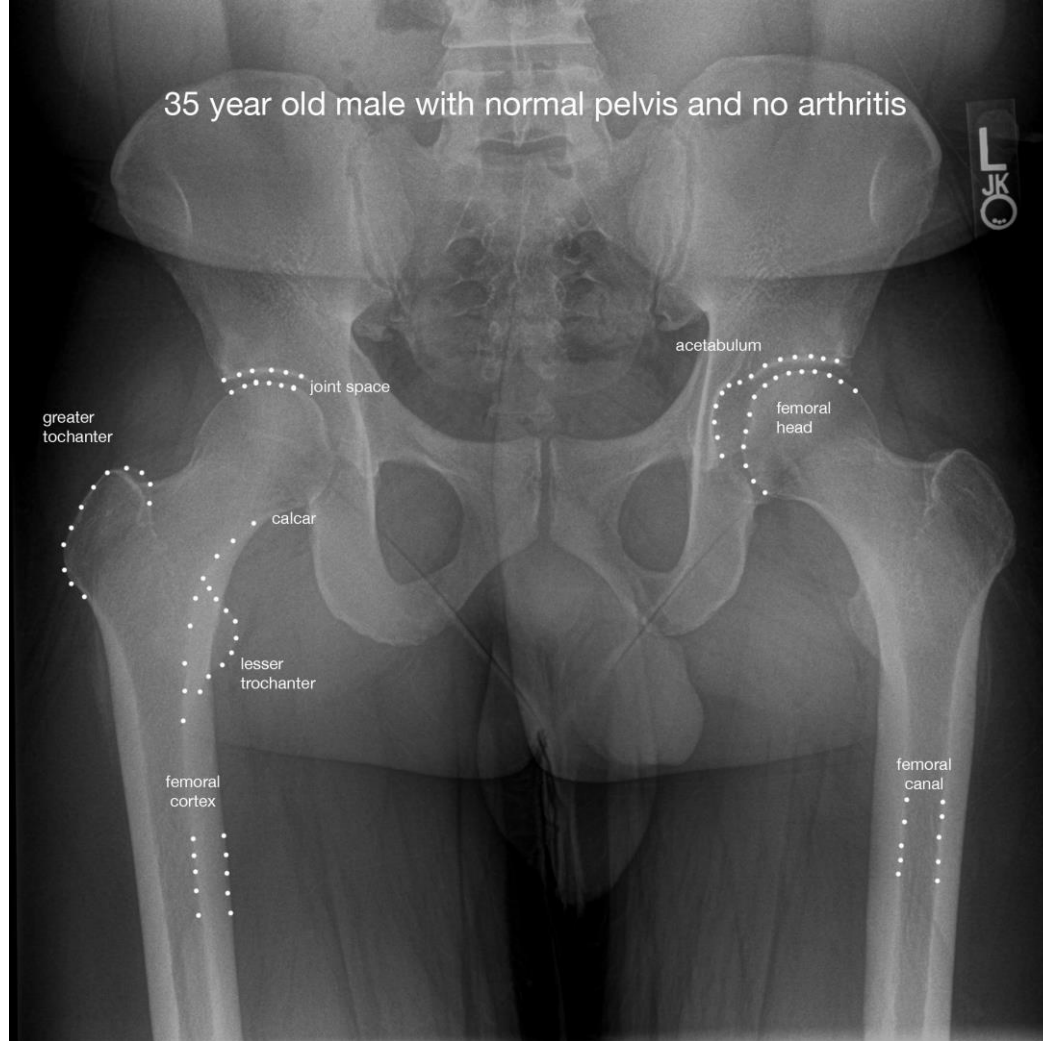


Adult

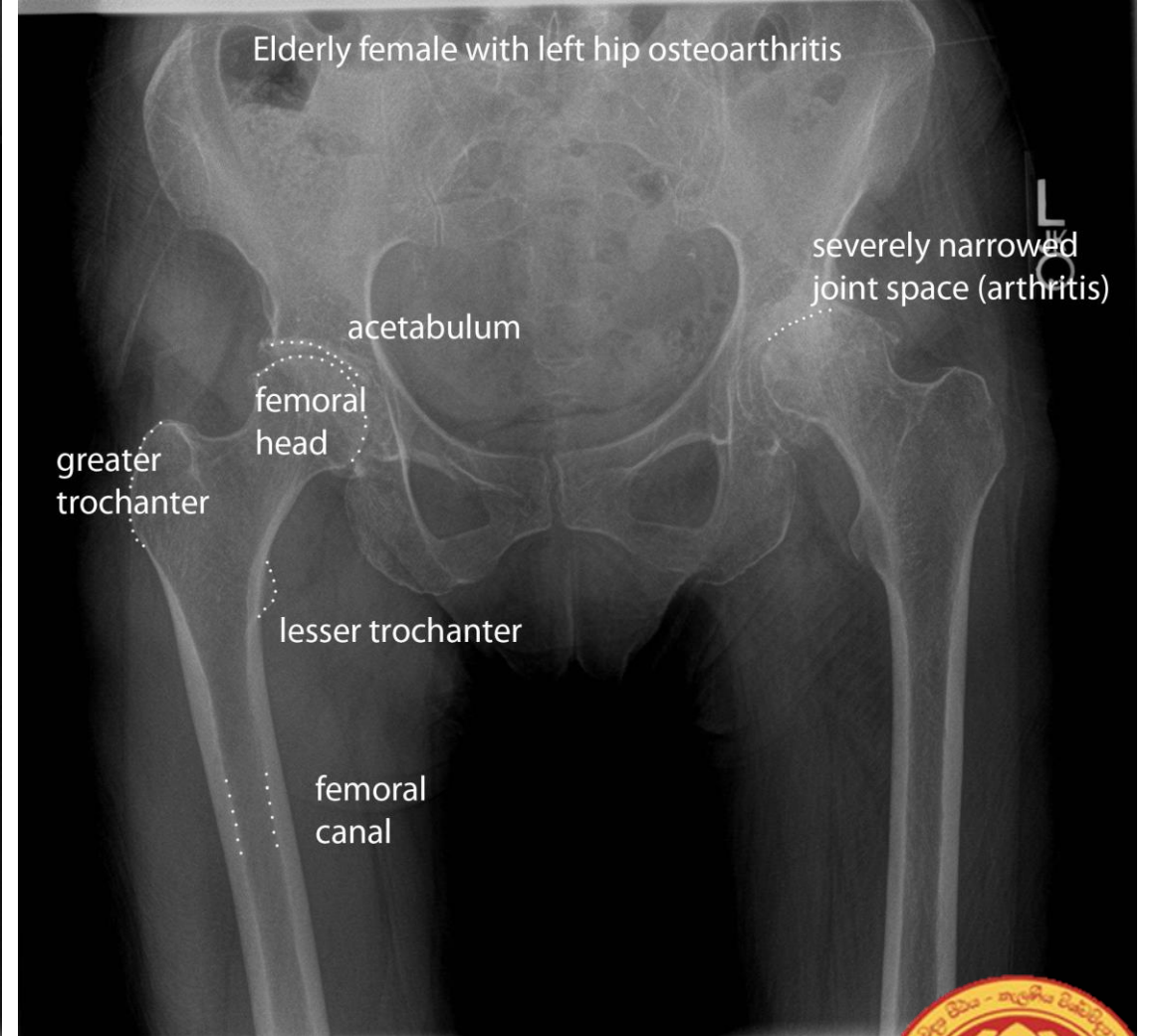


X Ray Hip joint -AP

π



Normal

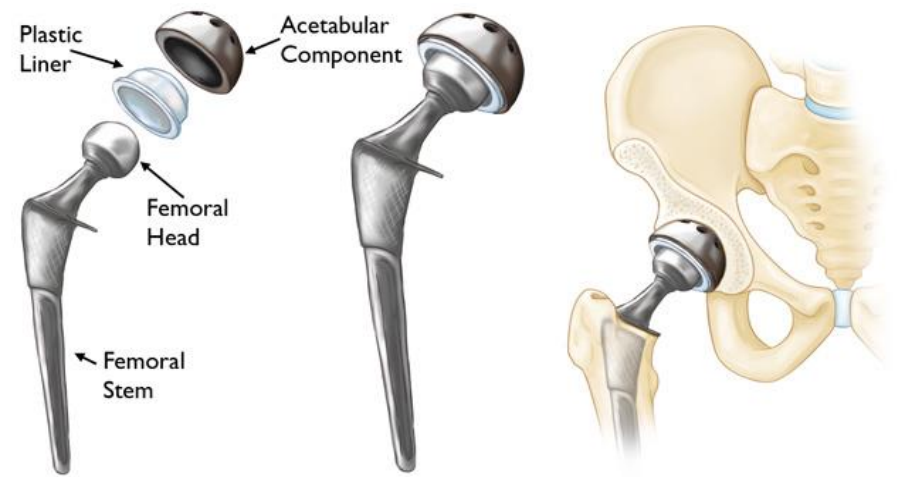


OA



X Ray Hip joint -AP

π



Femoral Head Dislocation

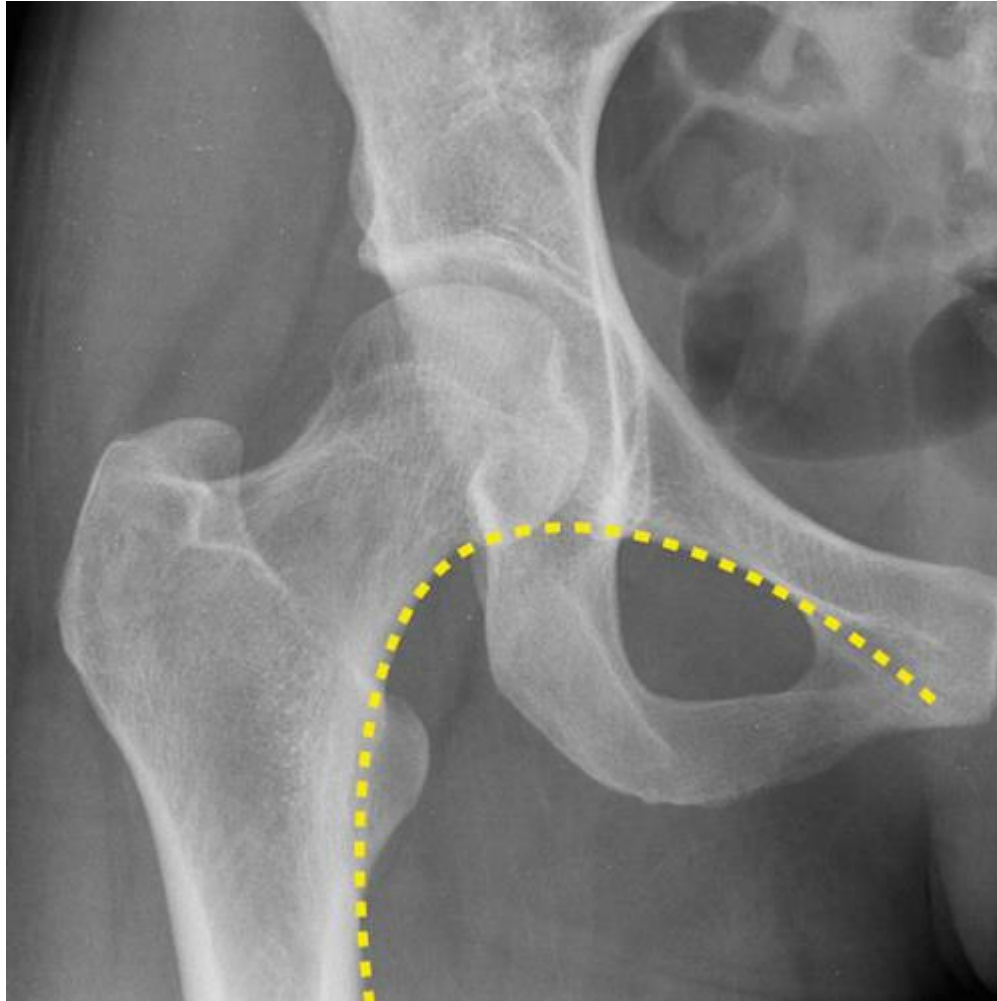


Prosthesis



Shenton 's line

π

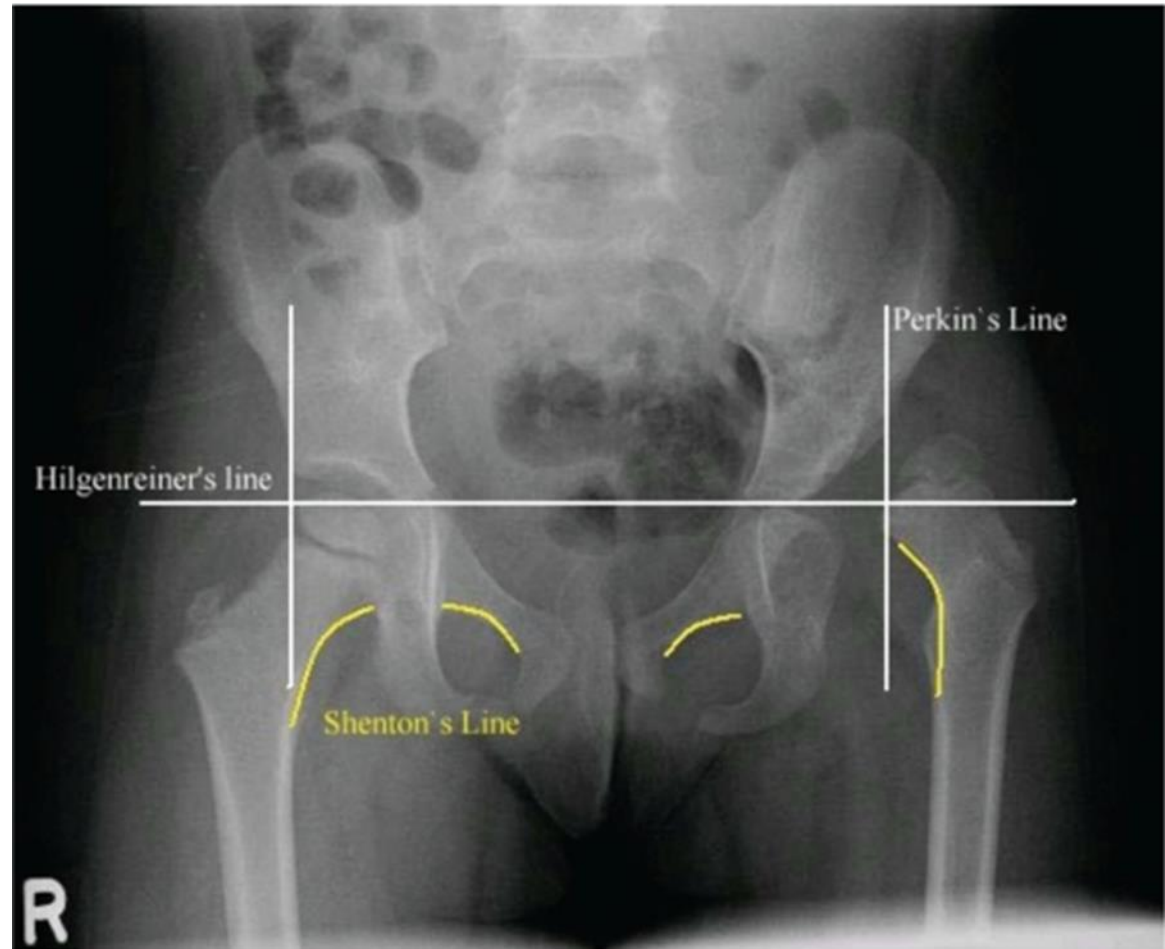


- AP view- normal alignment of the femoral neck can be traced
- Smooth imaginary line following the inferior edge of the superior pubic ramus and running along the medial edge of the femoral neck and shaft

Shenton's line

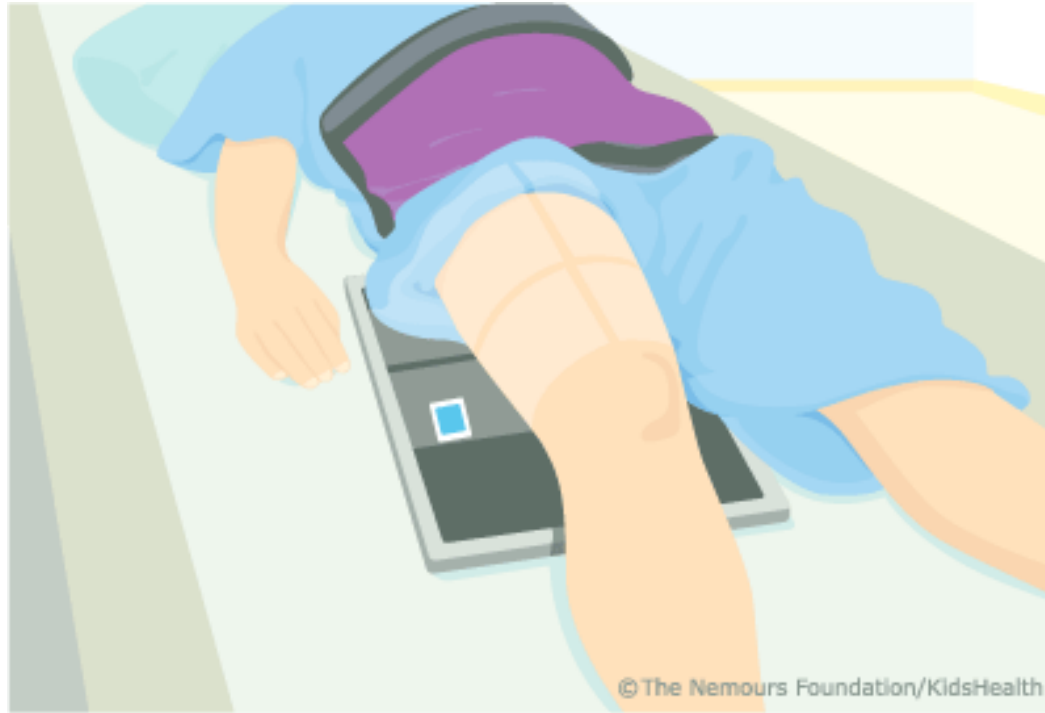
π

- Interruption of the Shenton's line can indicate
 - DDH
 - Fracture femoral neck
 - Femoral head dislocation



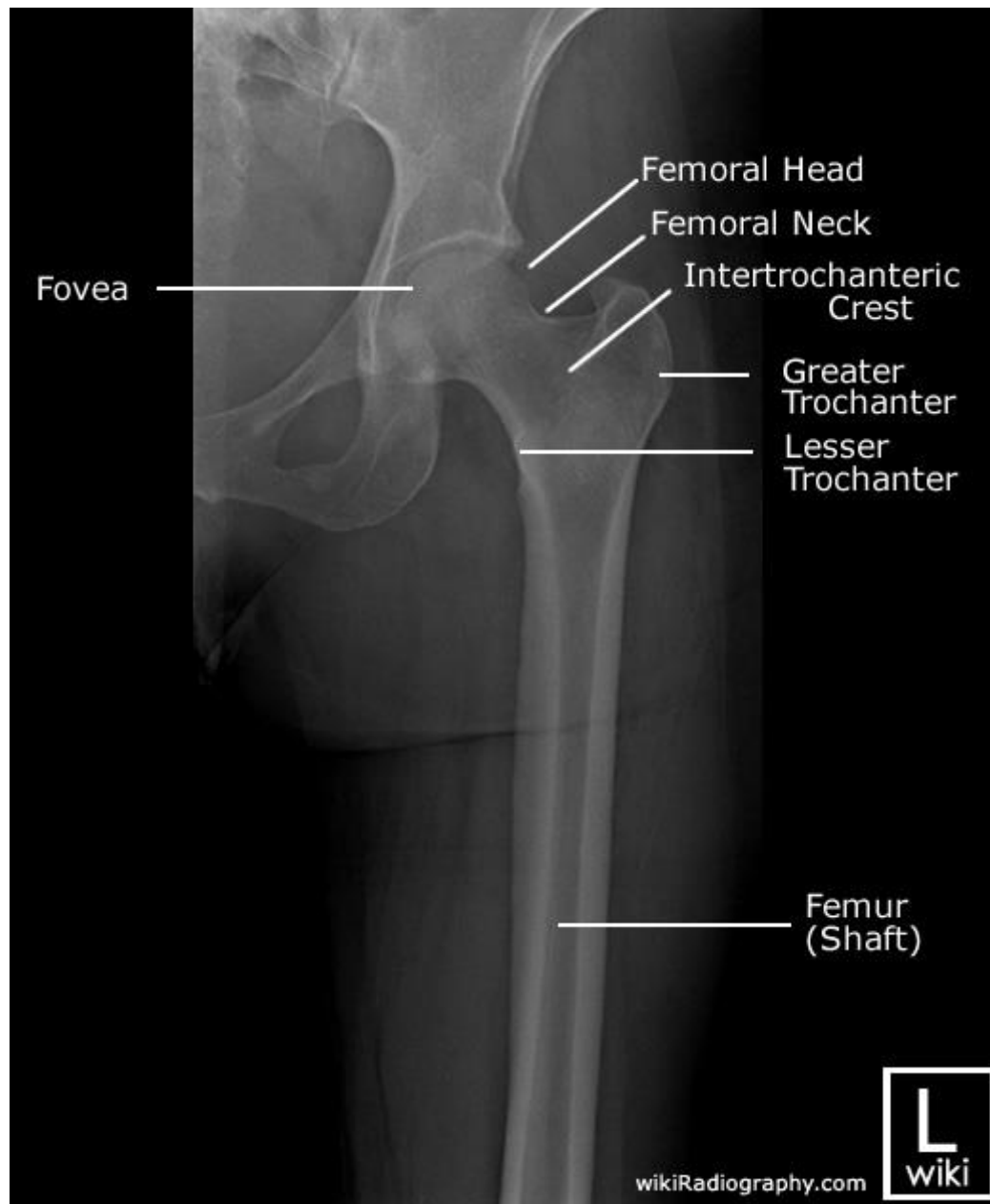
X Ray -Femur -AP

π

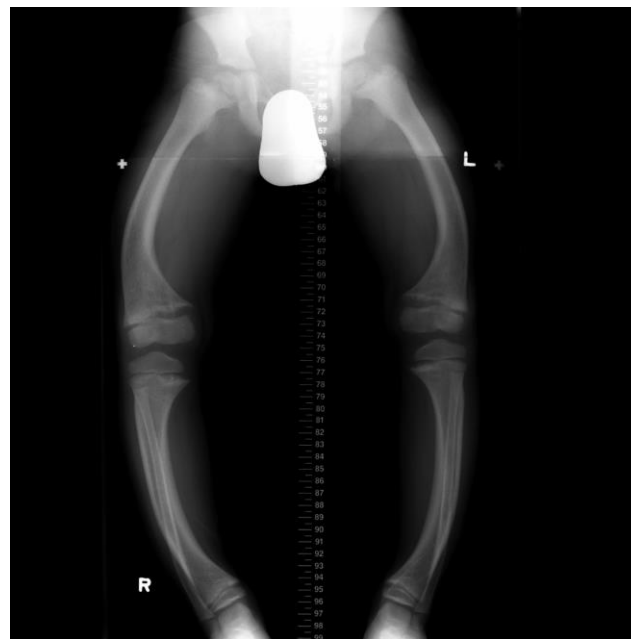


- To diagnose fractures
- To see bone tumours , metabolic conditions





π



6 year old /c
Hypophosphatemic rickets

Normal anatomy



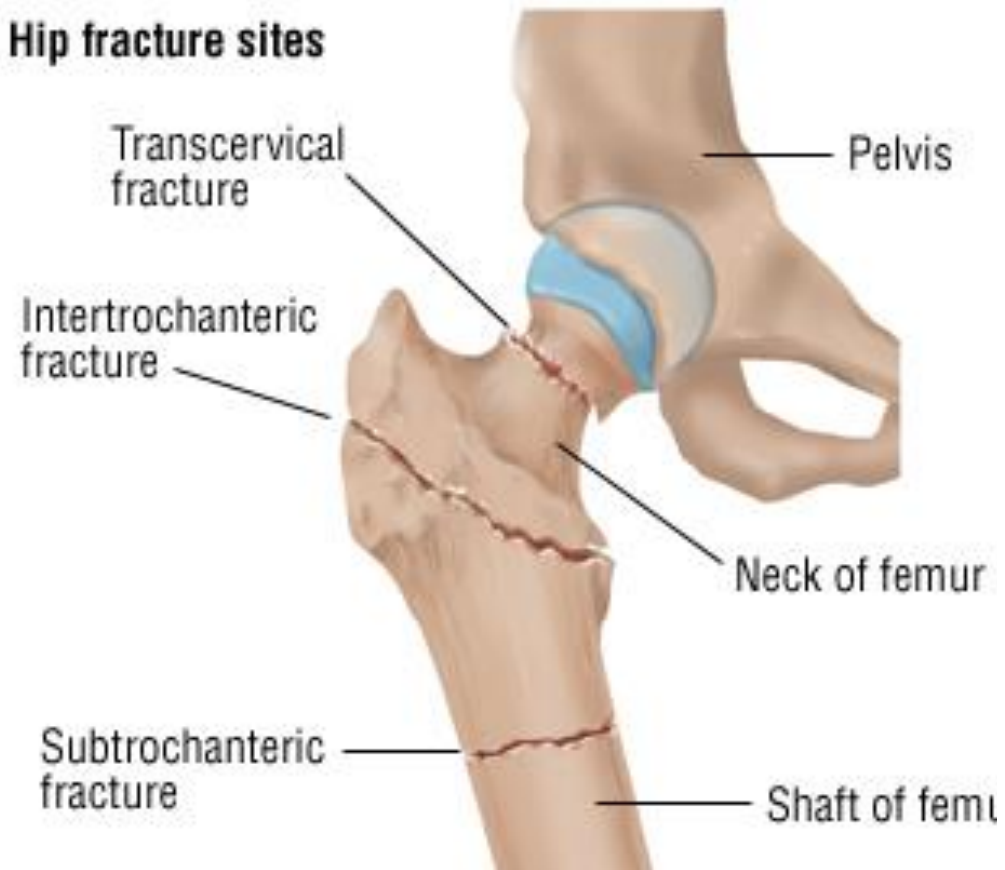
Rickets



Femoral fractures

π

Hip fracture sites



Fracture types



Oblique



Comminuted



Spiral



Compound

ADAM.



Femoral fractures

π



K-Nail

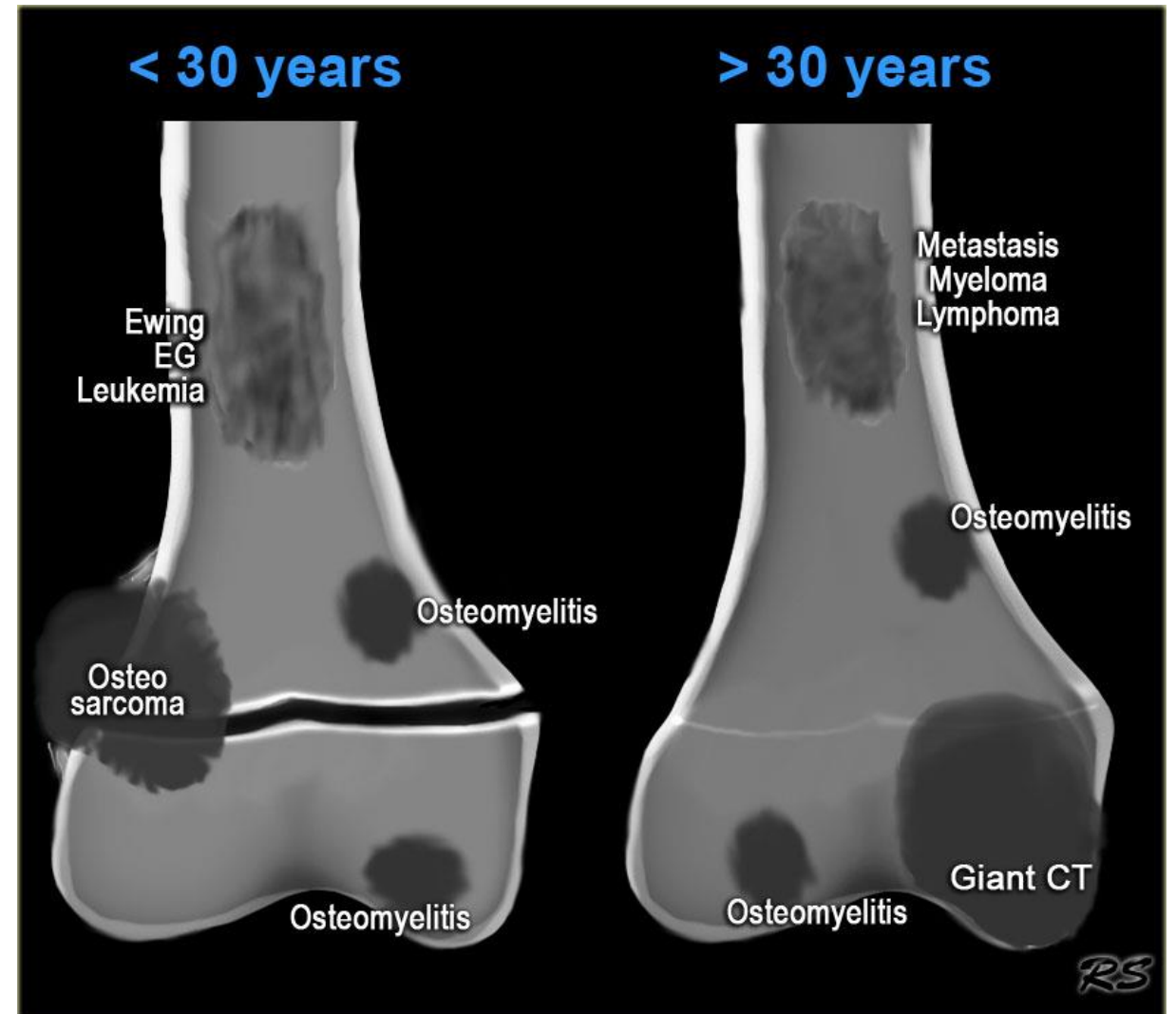


Bone tumours

π



**Ewing
sarcoma**



Knee joint

π

- Commonly used X Ray views
 - AP
 - Lateral - Horizontal Ray
 - Skyline
- The knee bones include the
 - Distal femur
 - Patella
 - Proximal tibia and fibula.

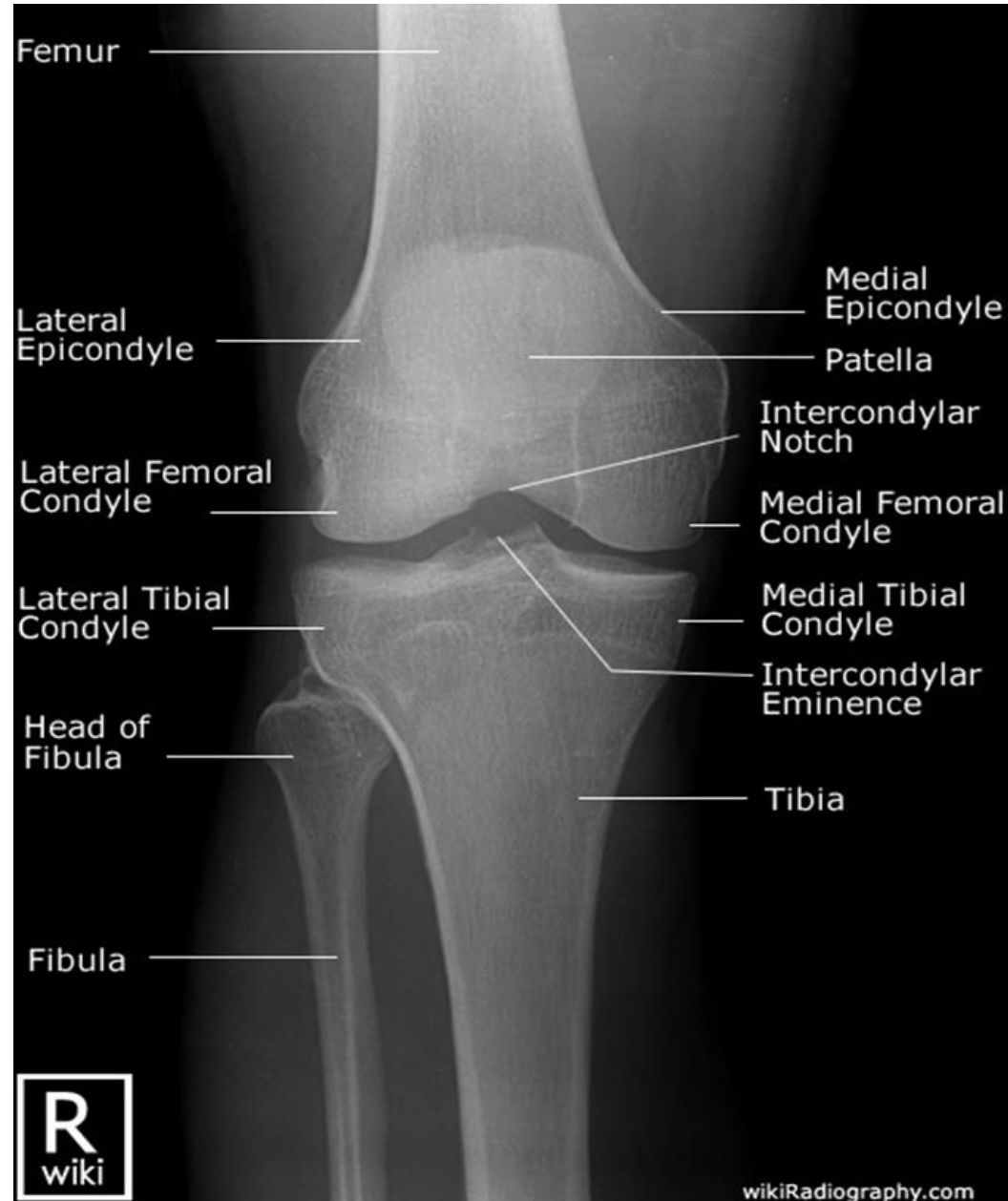
Knee-distal femur

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- Has lateral and medial condyles
- Articulate with the tibial plateau.
- The intercondylar fossa has attachment surfaces for the anterior and posterior cruciate ligaments (ACL and PCL).

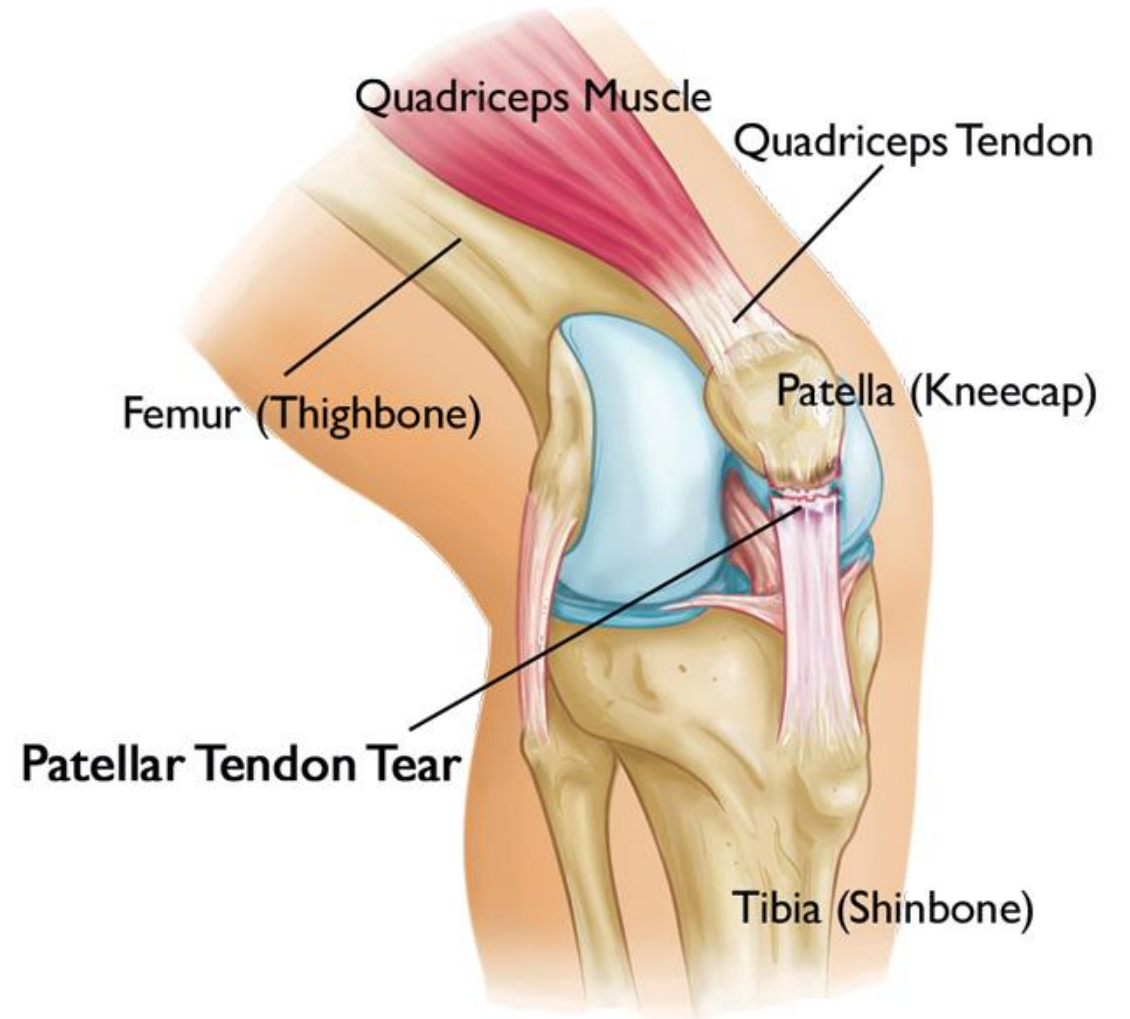
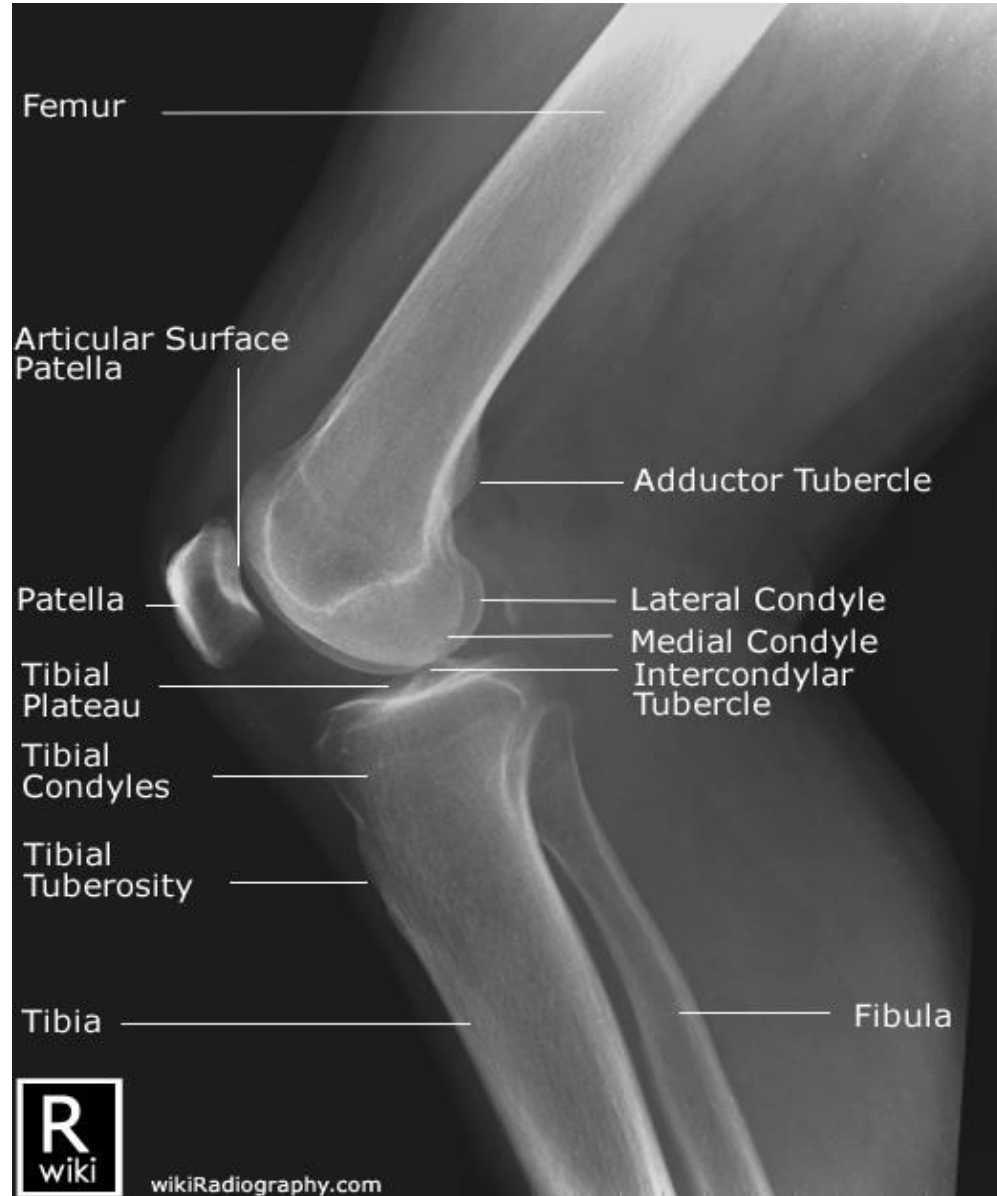
Knee joint-X Ray -AP

π



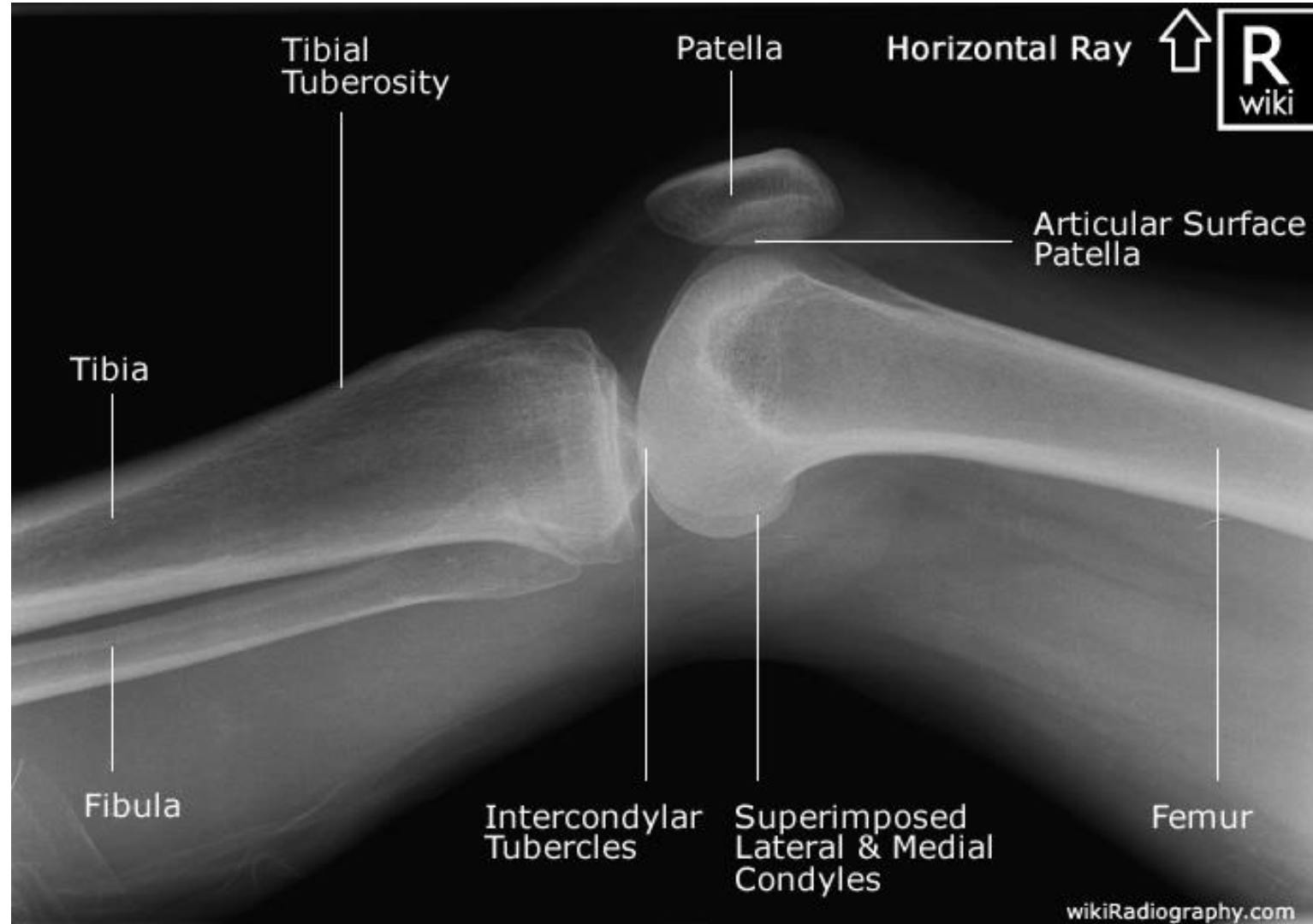
Knee joint-X Ray

π



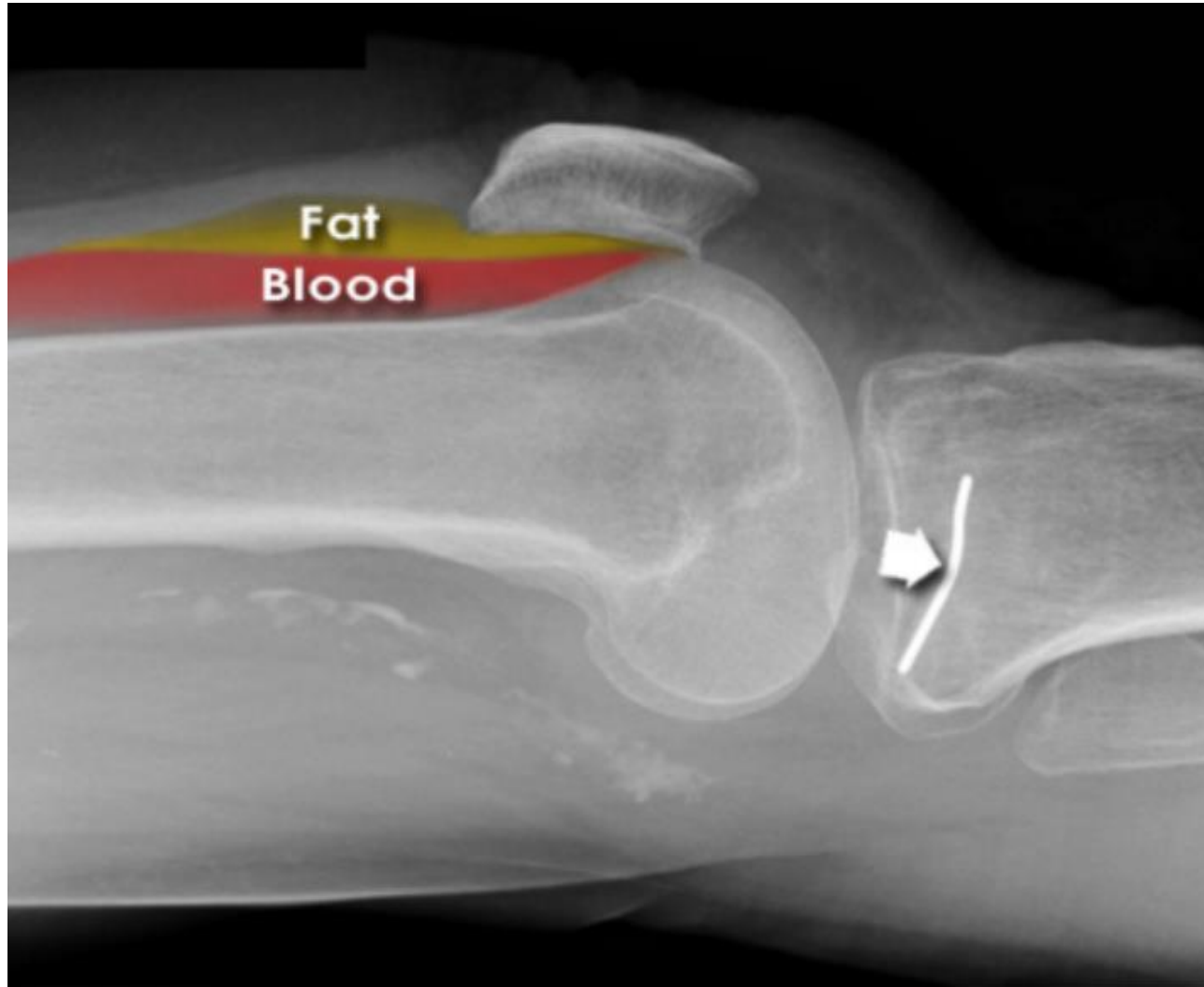
Knee joint- Horizontal Ray Lateral View

π



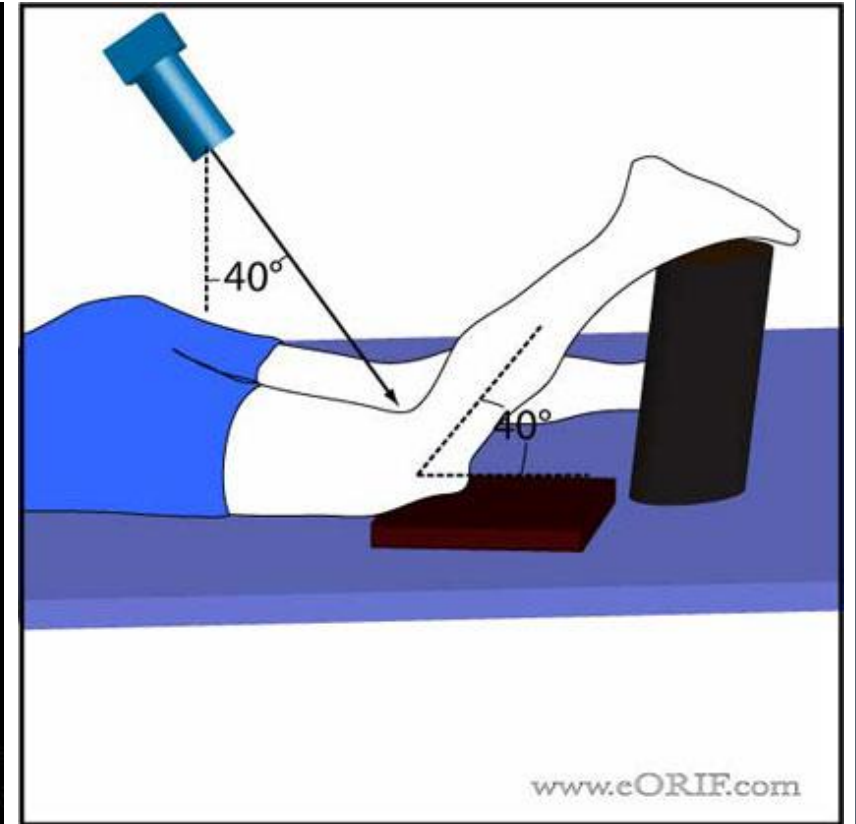
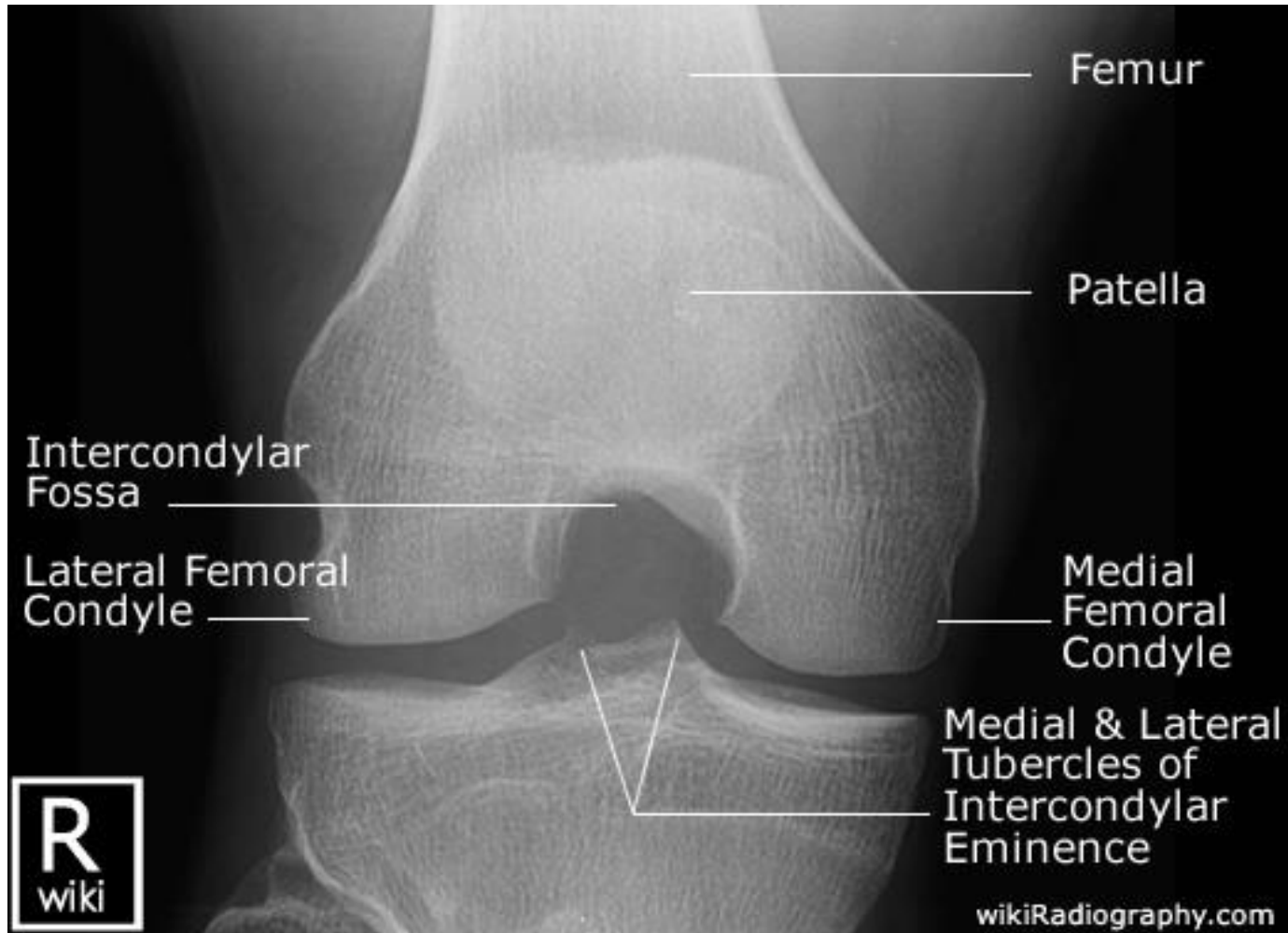
Adult Knee (trauma) - Horizontal Ray Lateral View

π



Tunnel view intercondylar view

π



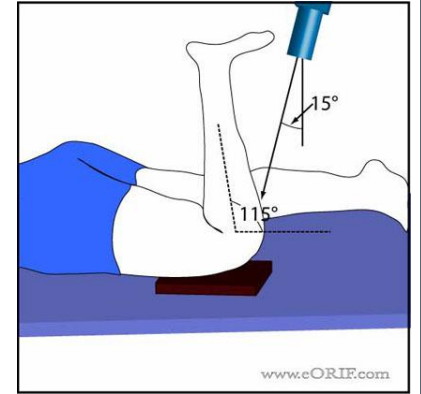
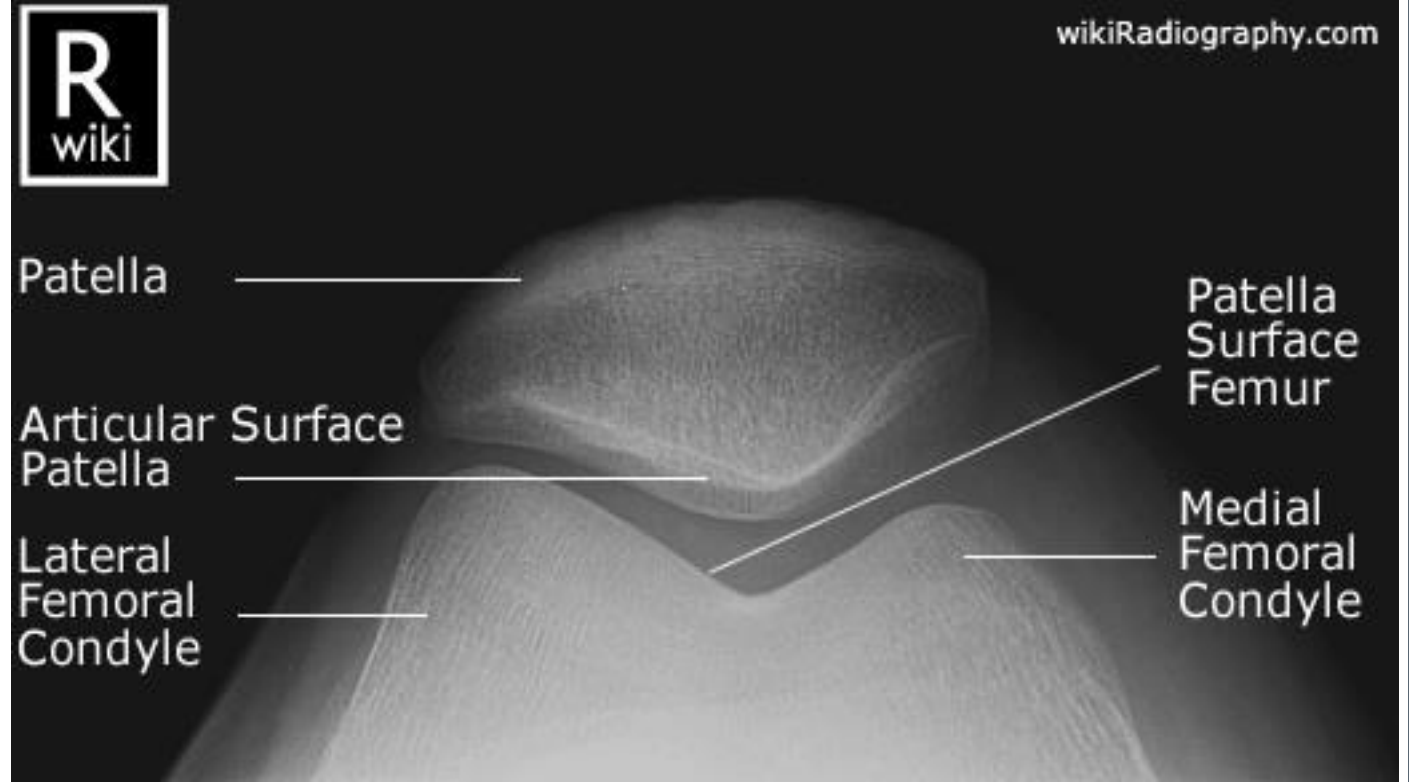
Knee-patella

π

- Largest sesamoid bone of the body.
- It overlies the superior aspect of the articular surface of the distal femur
- Articulates with the femur at the patellofemoral joint.

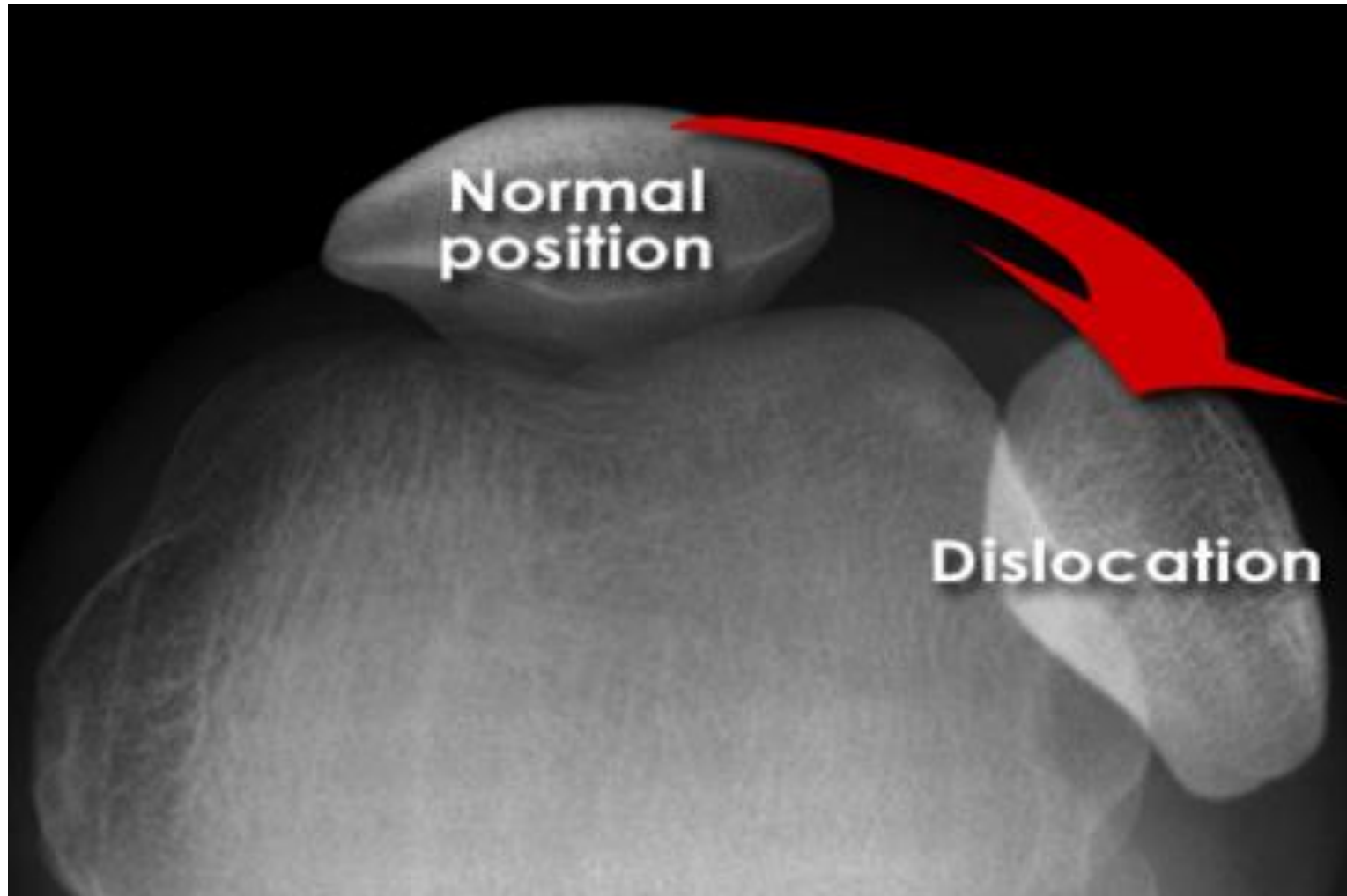
Patella-lateral and sky line view

π



Sky line view

π



Knee-proximal tibia

π

- This has a **plateau** divided into medial and lateral compartments by the anterior and posterior tibial spines
- Attachment points for the cruciate ligaments.
- The **tibial tuberosity** lies on the anterior proximal tibial surface - the patellar tendon attaches.

Knee-proximal tibia

π



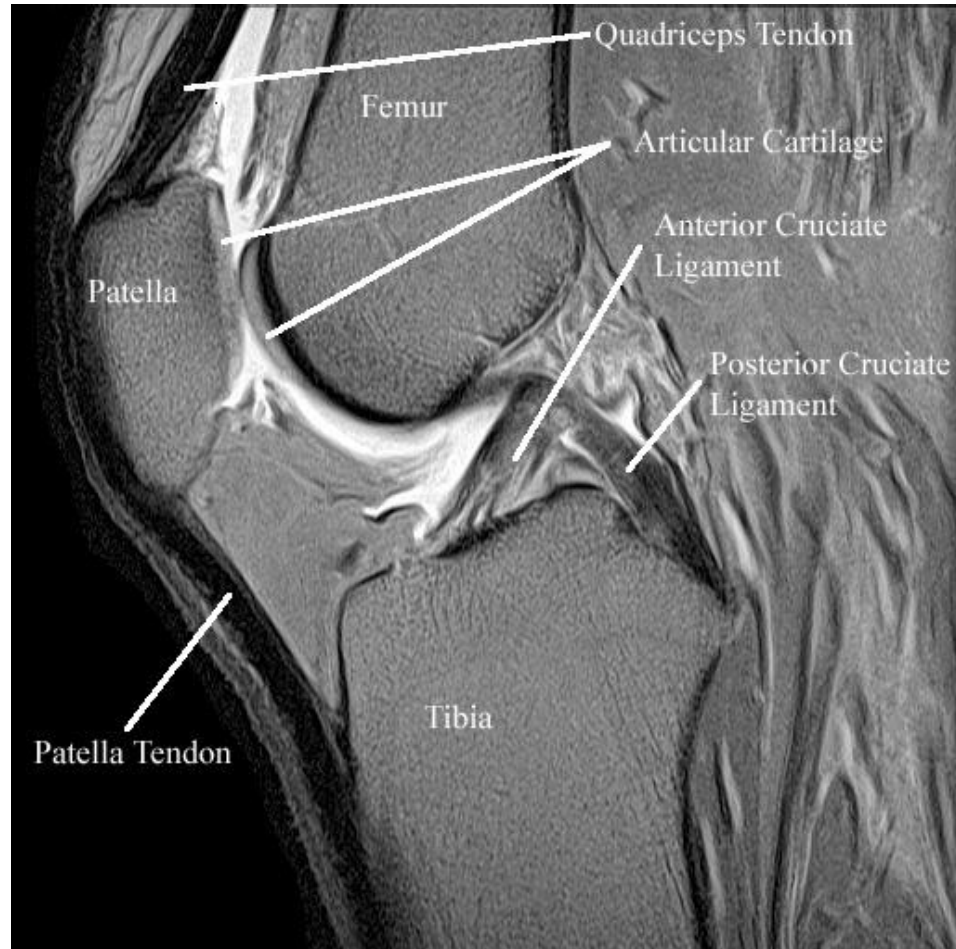
Indications for Knee MRI

π

- **Meniscal disorders:** nondisplaced and displaced tears, discoid menisci, meniscal cysts
- **Ligament tears:** cruciate, collateral, retinacular
- **Extensor mechanism abnormalities:** quadriceps tendon, patellar tendon, patella
- **Osteochondral and articular cartilage abnormalities:** osteochondral fractures, osteochondritis dissecans, degenerative chondrosis, chondromalacia, chondral fissures, fractures, flaps and separations
- **Loose bodies:** chondral, osteochondral, osseous
- **Synovial-based disorders:** symptomatic plicae, synovitis (including pigmented villonodular synovitis), bursitis, and popliteal cysts
- **Marrow abnormalities:** avascular necrosis, marrow edema syndromes, and stress fractures
- **Muscle and tendon disorders:** strains, partial and complete tears, tendonitis, tendonopathy, infiltration
- **Neoplasms** of bone, joint or soft tissue
- **Infections** of bone, joint or soft tissue
- **Congenital and developmental conditions:** Blount disease, dysplasia, normal variants
- **Vascular conditions:** entrapment, aneurysm, stenosis, occlusion, cystic change
- **Neurologic conditions:** entrapment, compression, denervation, and peripheral neuritis

Knee joint- MRI

π

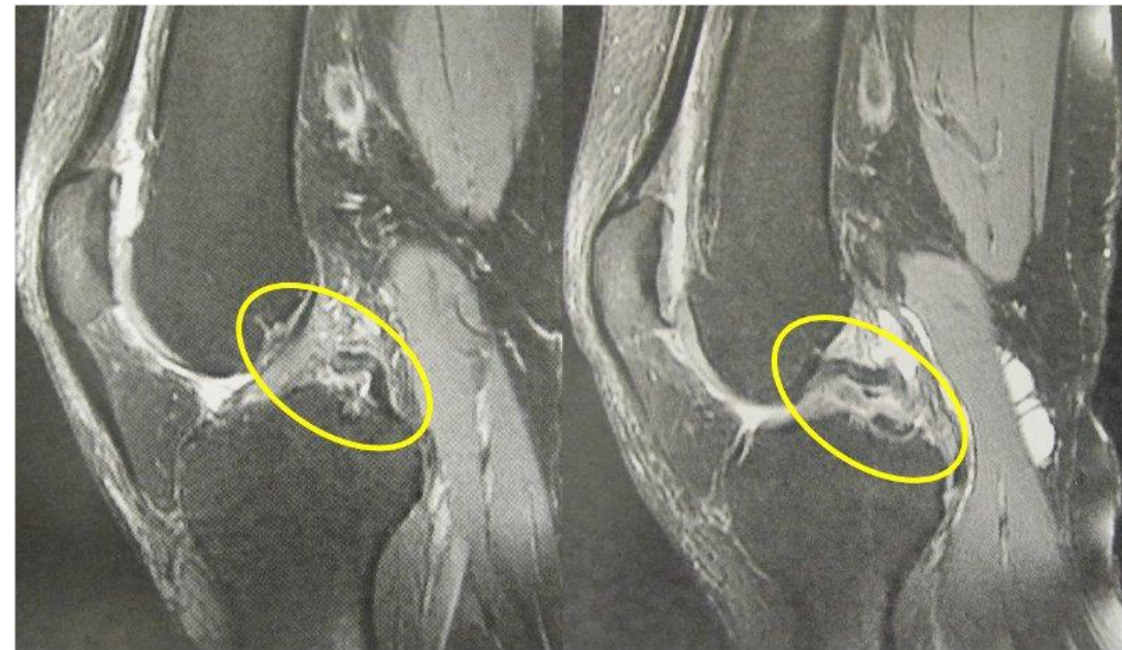


Knee joint- MRI

π



ACL Tear



PCL Tear

Knee joint- MRI

π



Meniscal tear

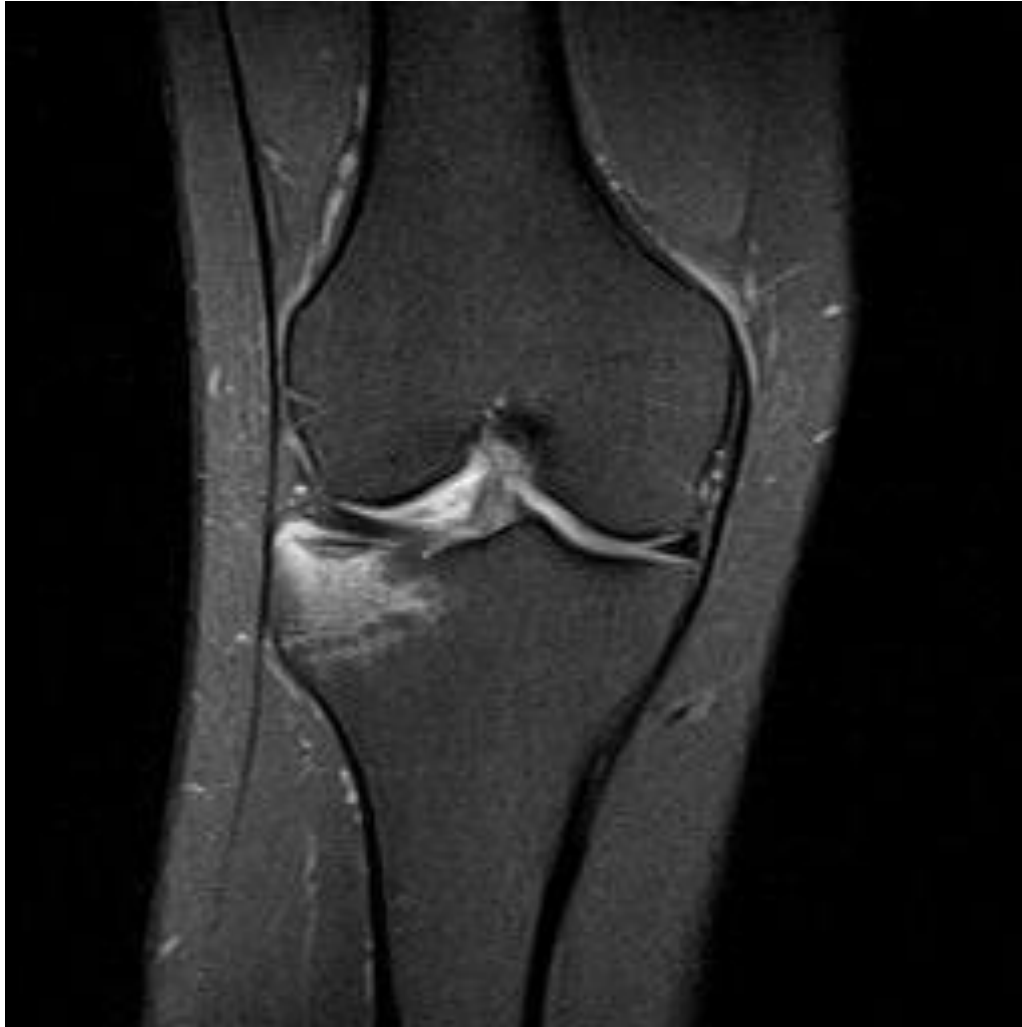
Grade III
MCL tear



MCL tear

Knee joint- MRI

π



Tibial plateau fracture



Osteosarcoma

Ankle joint

π

- AP view
- Lateral view
- Mortise view

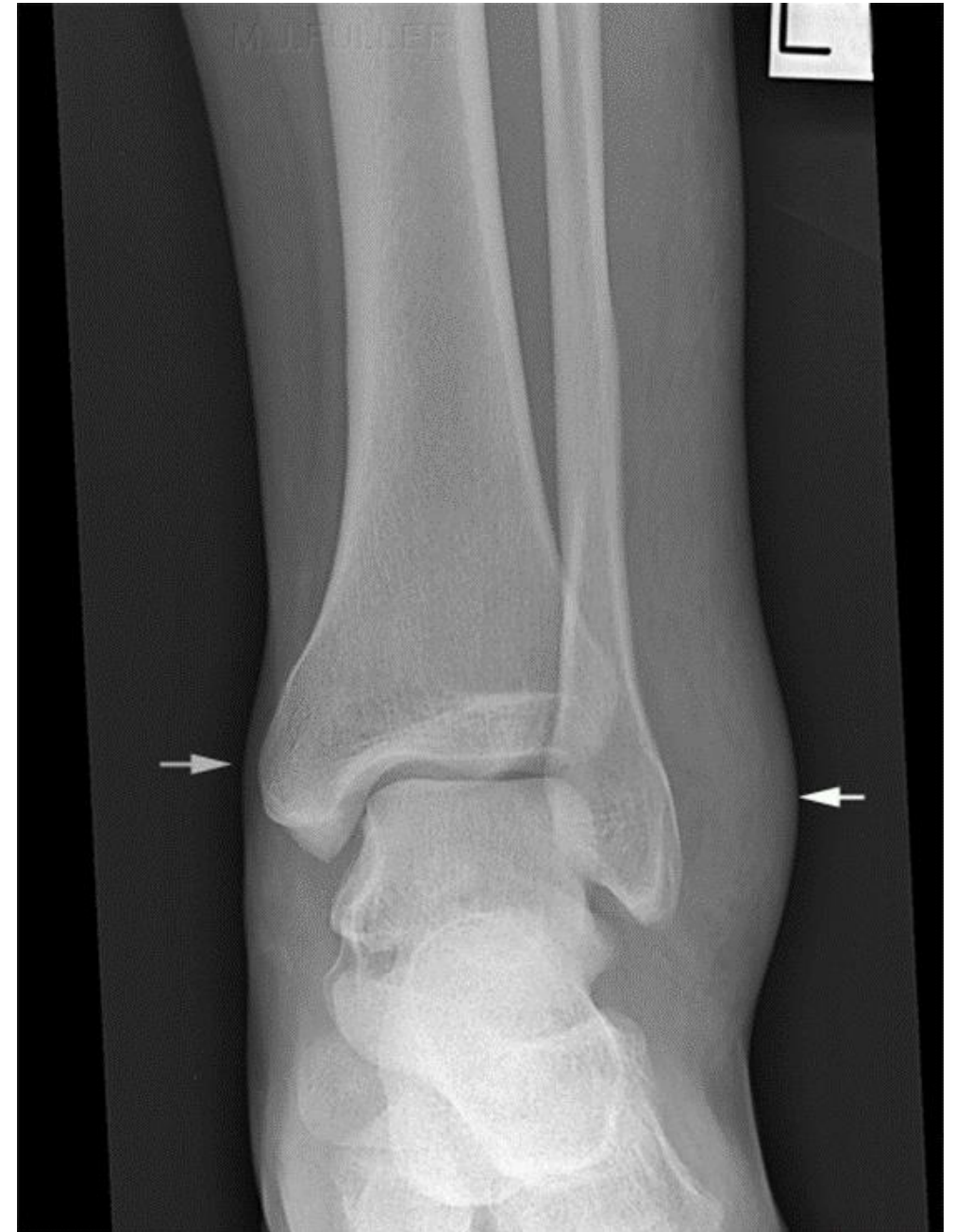
The ankle bones include

- Distal tibia
- Distal fibula
- Talus.

Ankle-malleoli

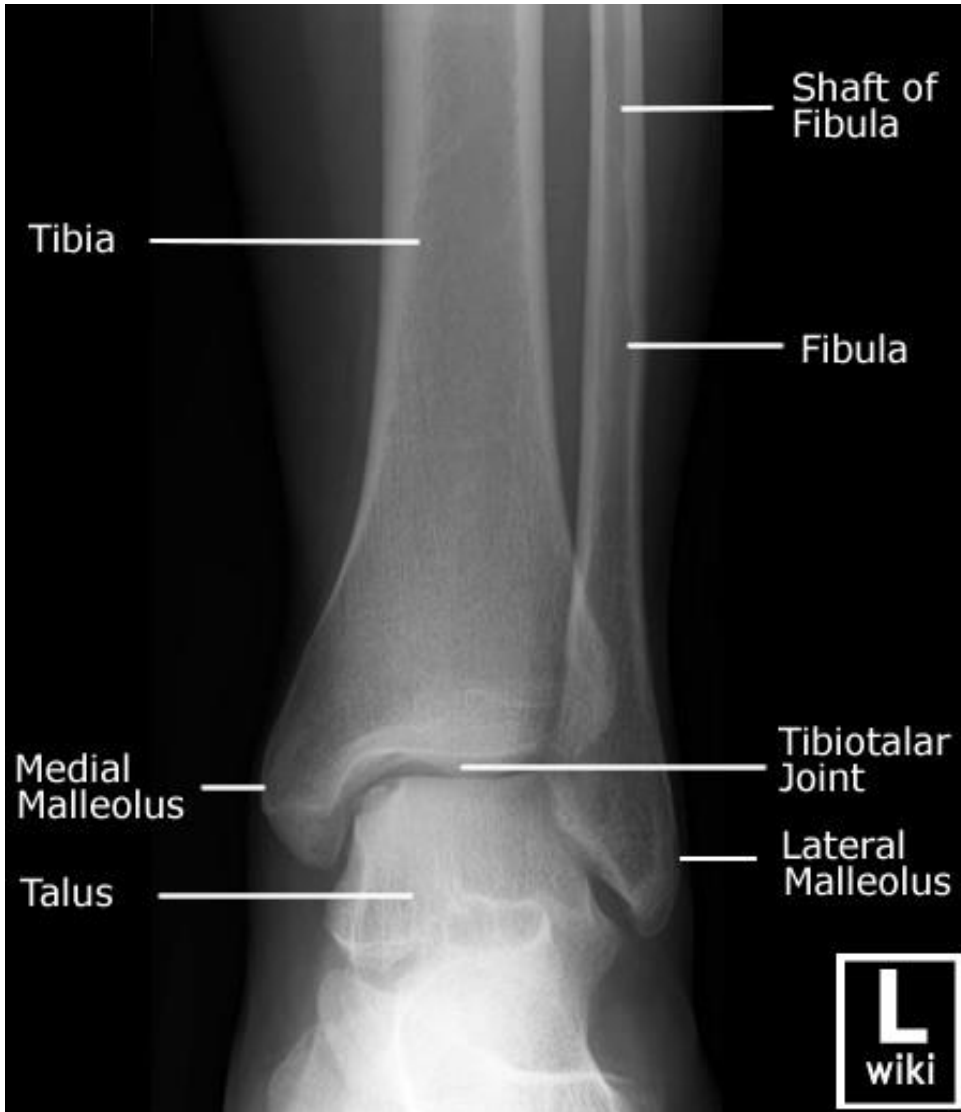
π

- Medial malleolus - medial edge of the distal tibia.
- Lateral malleolus - distal fibula.
- Dome of the talus lies within the mortise, a formed by the distal tibia and fibula

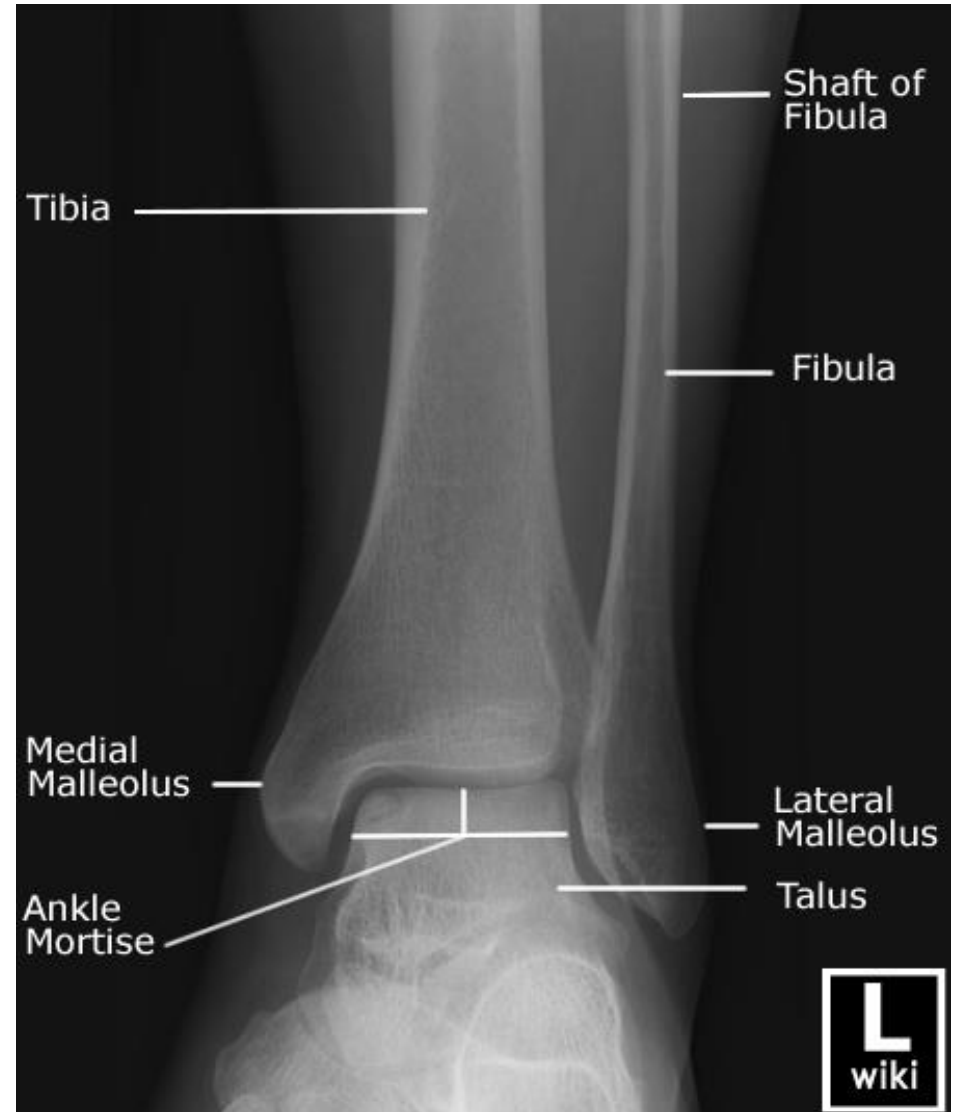


Ankle joint -X Ray

π

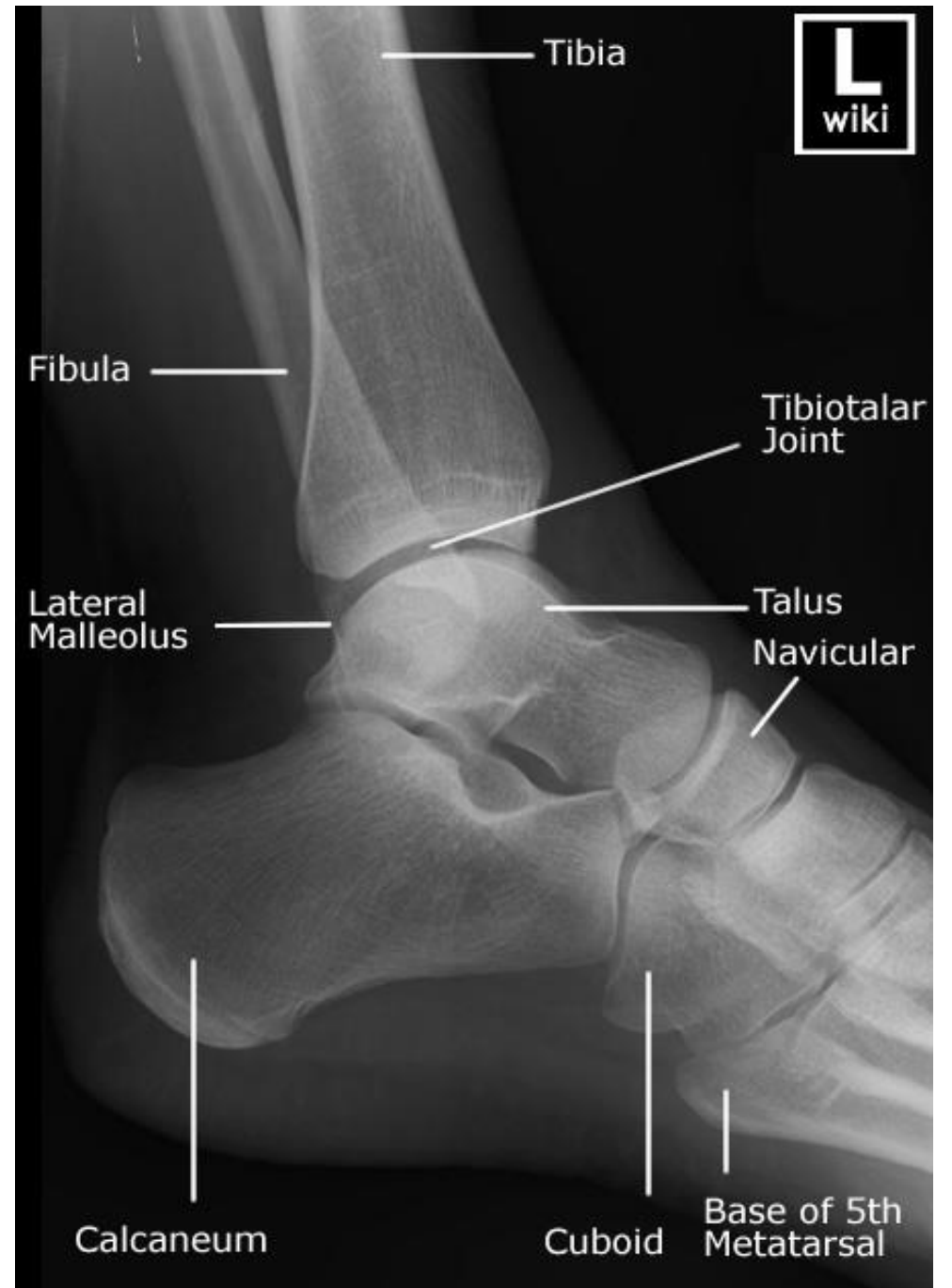


AP -View



Ankle - Mortise View

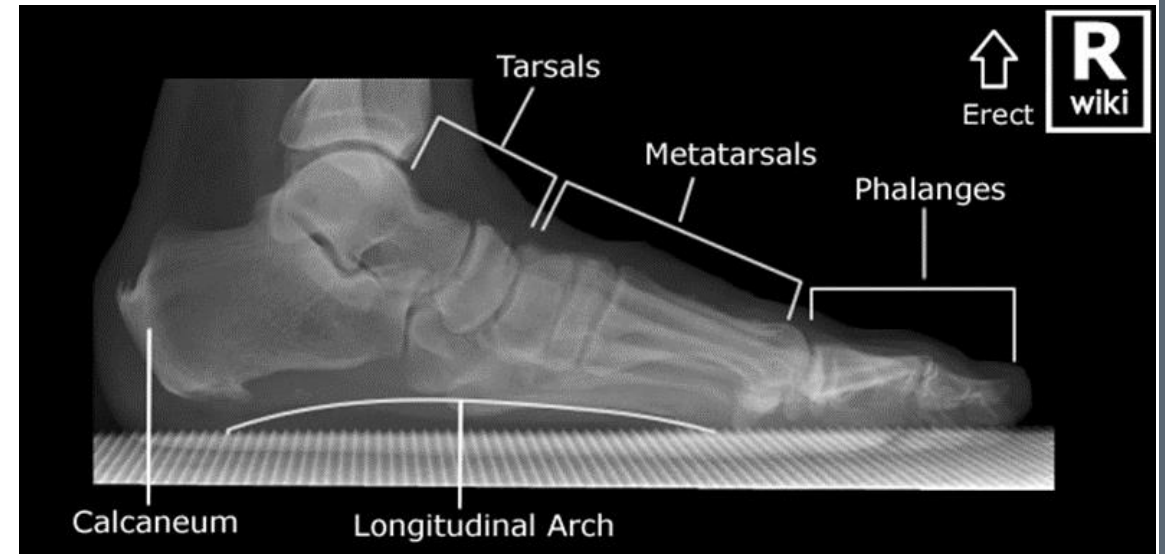
Ankle joint -X Ray lateral



X Ray -foot

π

- The foot bones include the
 - Anterior margin of calcaneus
 - Head of talus,
 - Mid foot bones (navicular, cuboid and cuneiforms),
 - Metatarsals and phalanges.



X Ray foot –Common views

π

- Dorsal planter view
- Oblique view
- Lateral view
- Weight Bearing view

Dorsal planter view

π



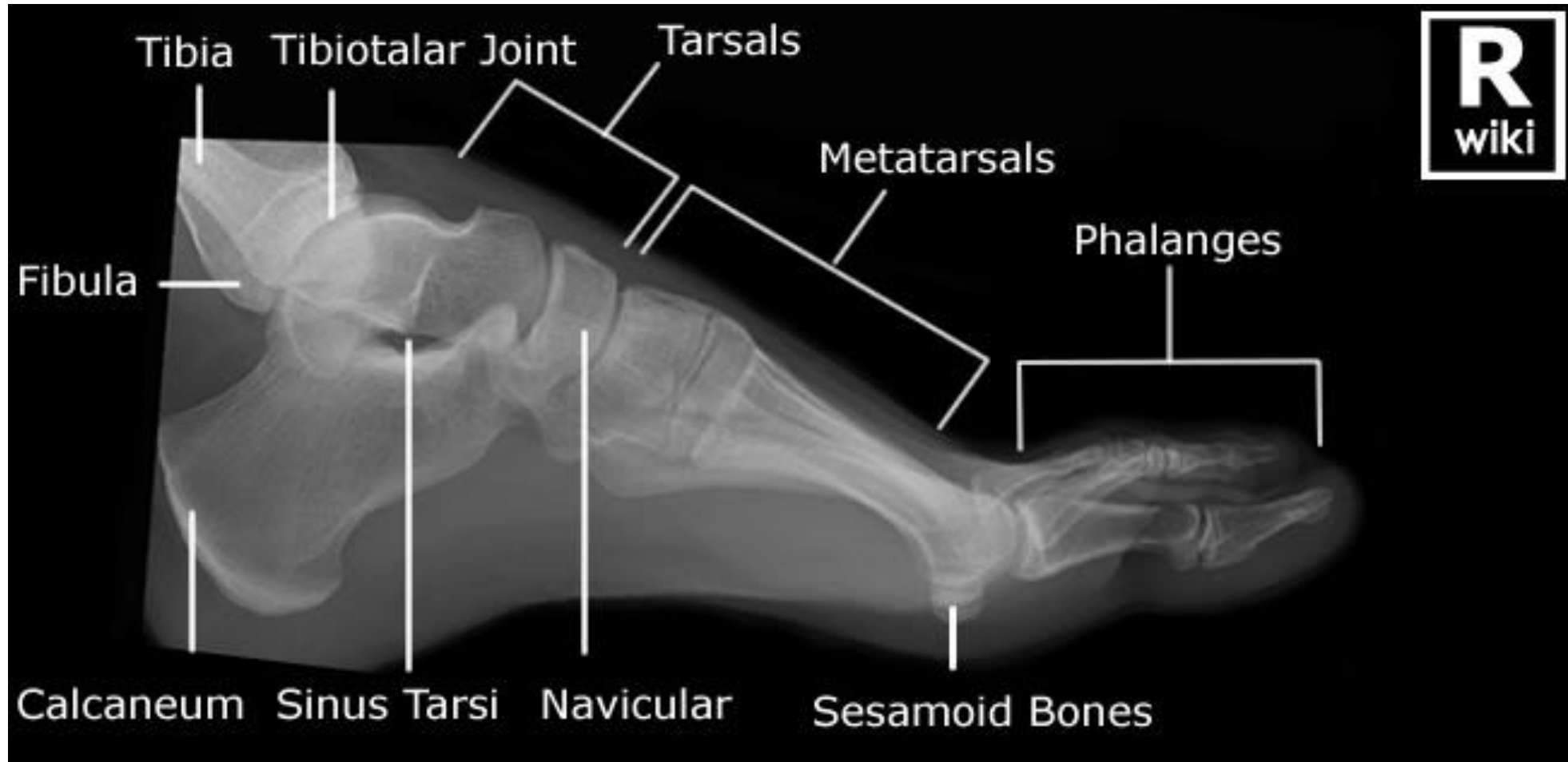
Oblique view

π



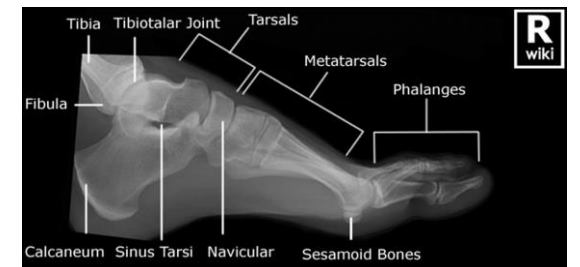
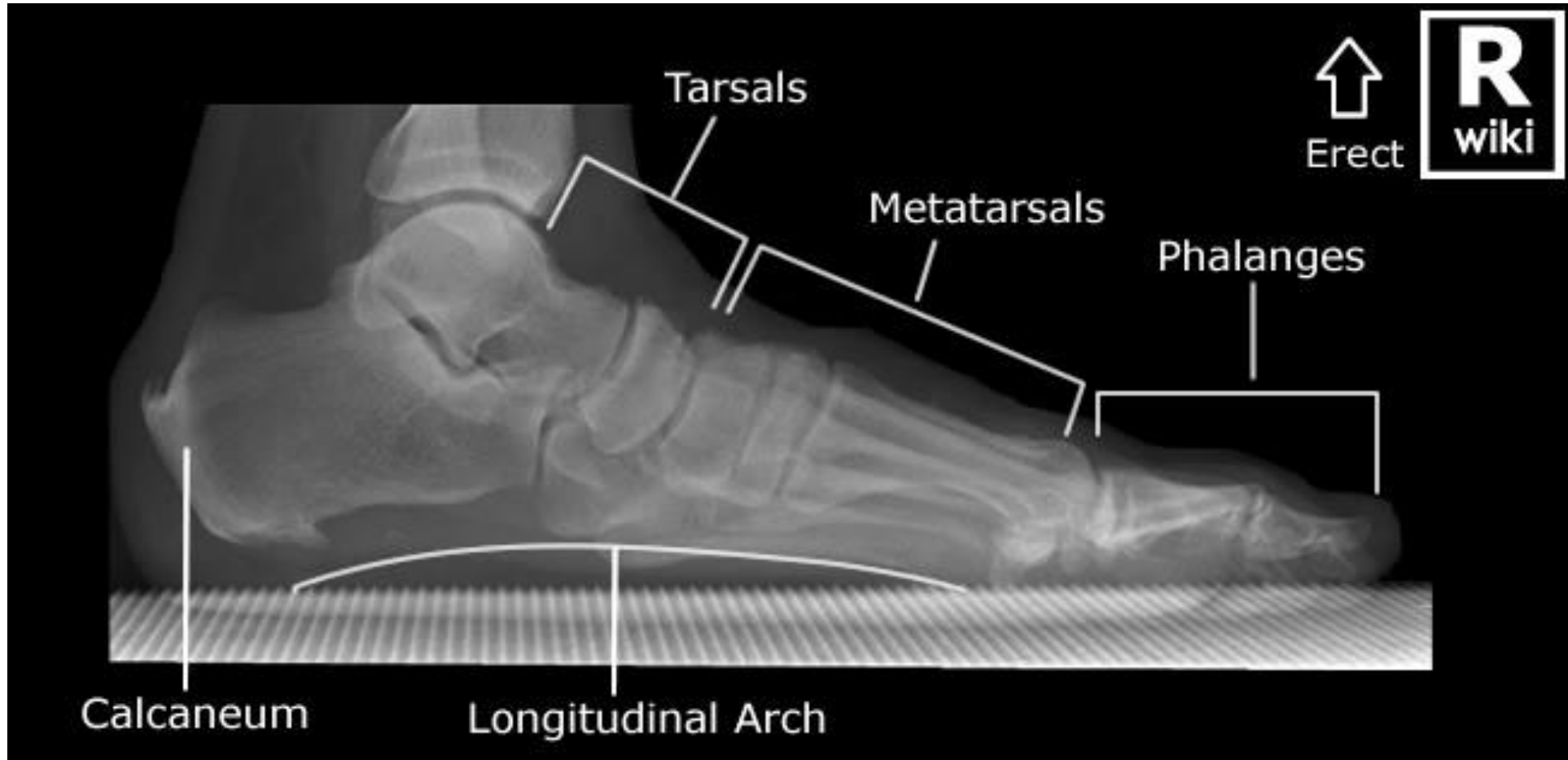
Lateral view

π



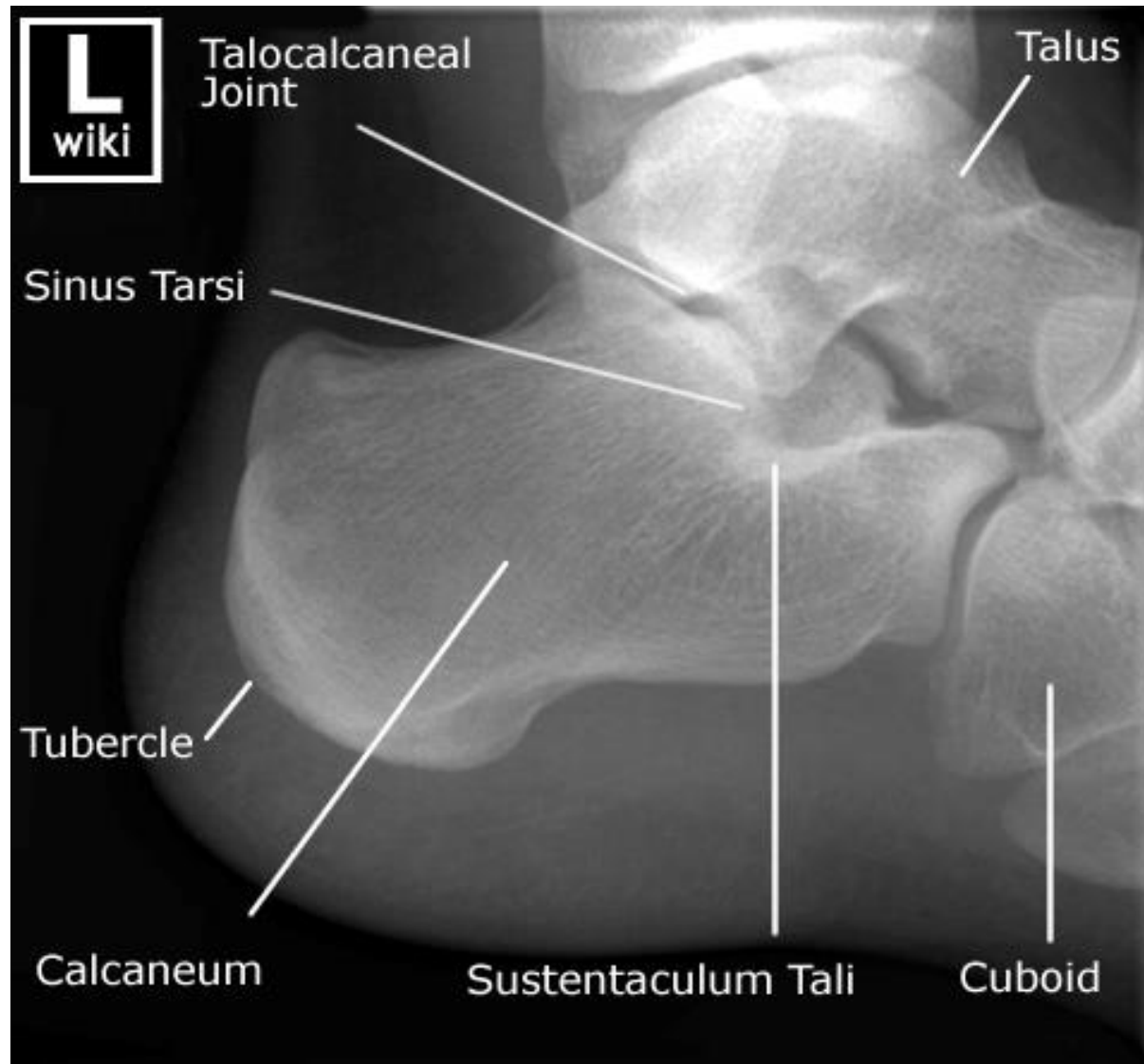
Weight Bearing view

π



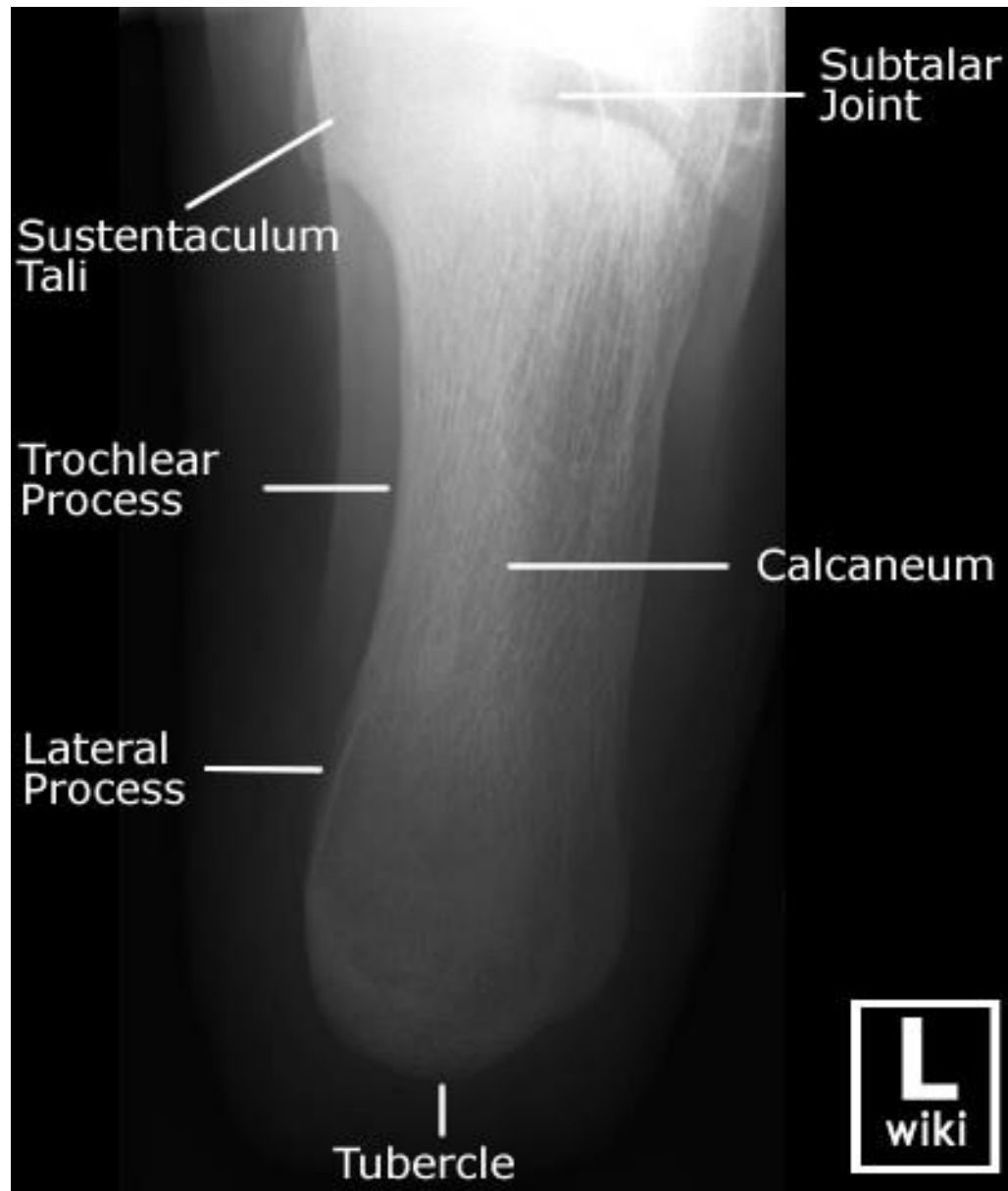
Adult Calcaneum - Lateral View

π



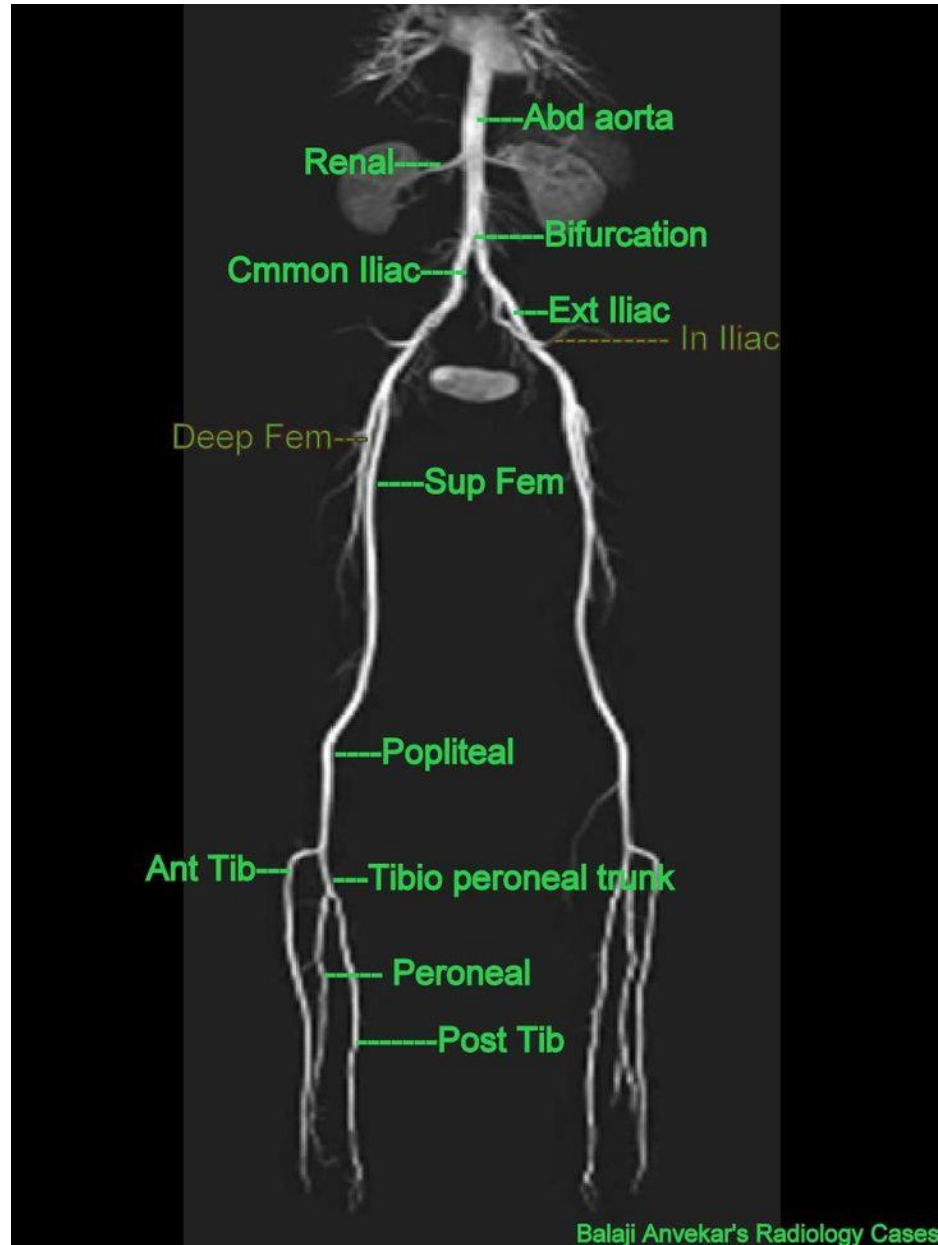
Adult Calcaneum - Axial View

π



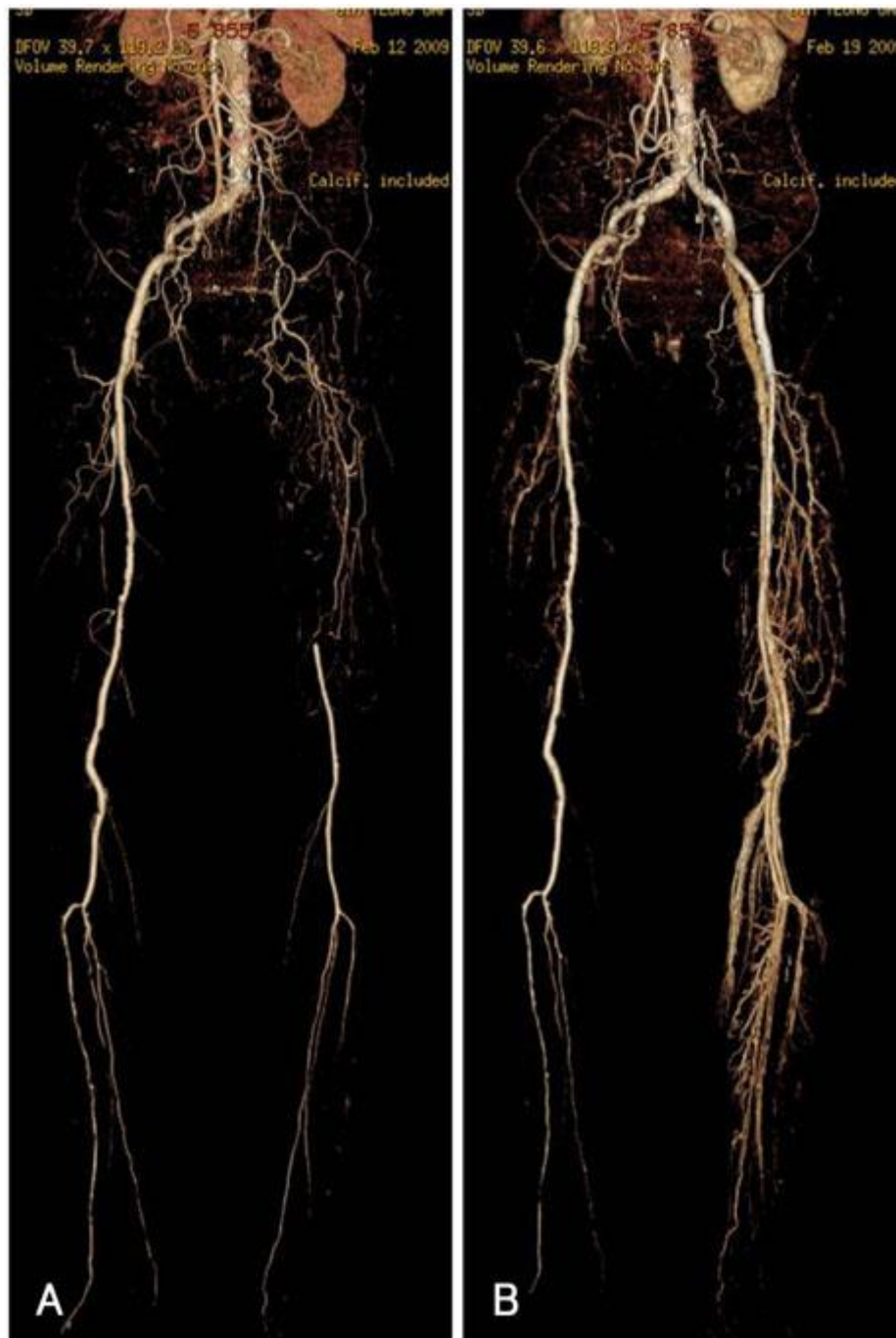
Lower Limb Angiogram

π



π

CT-Lower Limb Angiogram



Bone scans



THANK YOU.....!

