SAWA UNIVERSITY

RADIOGRAPHIC TECHNIQUE-1

FOOT, PATELLA PROJECTIONS

Sawa University

College of health and medical techniques

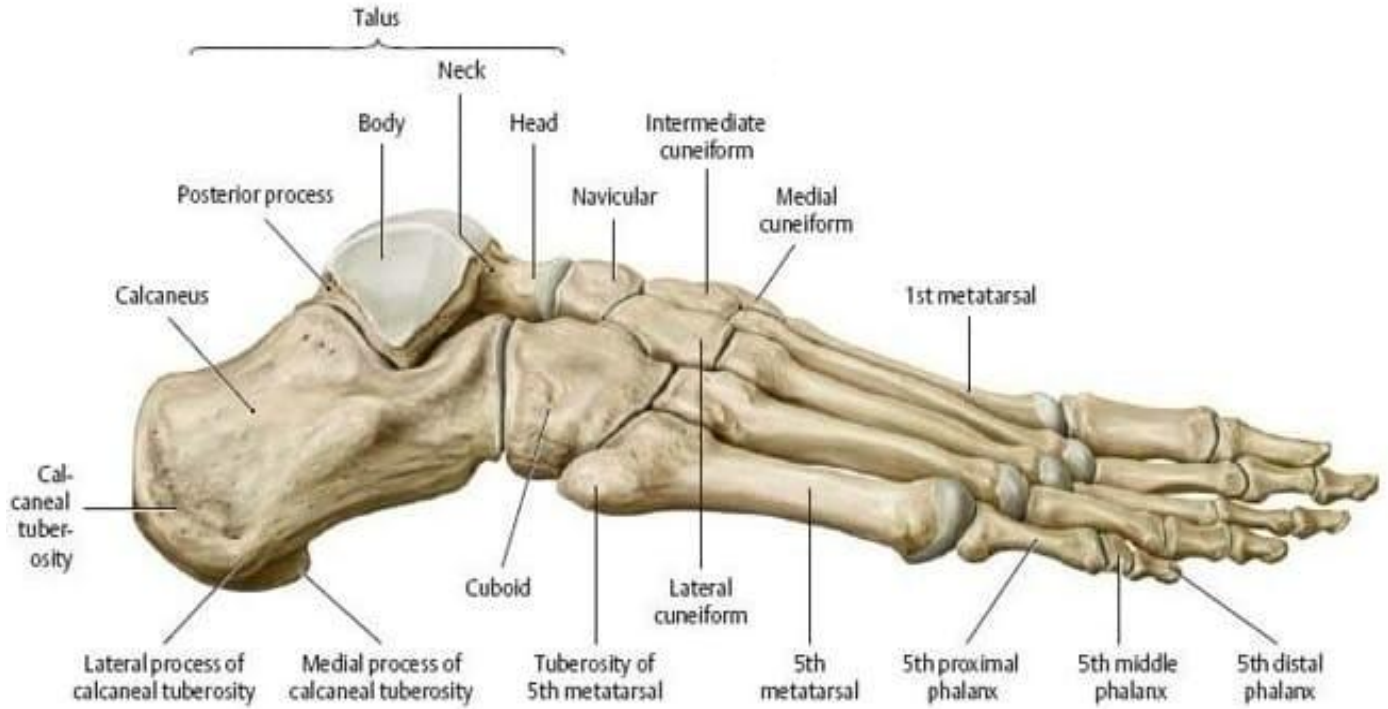
Department of Radiology Tech.

2nd Academic year

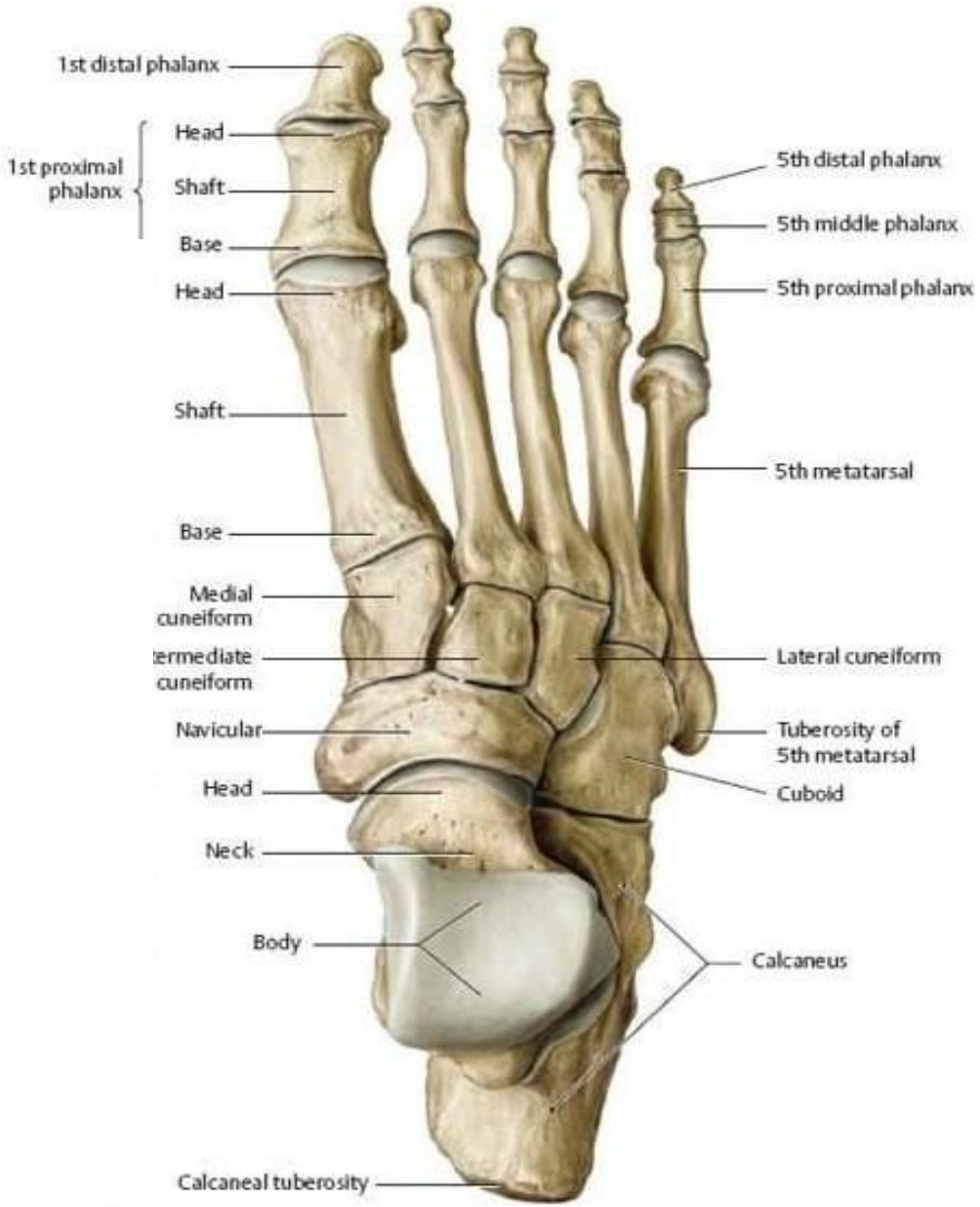
LEC.6

THEORTICAL

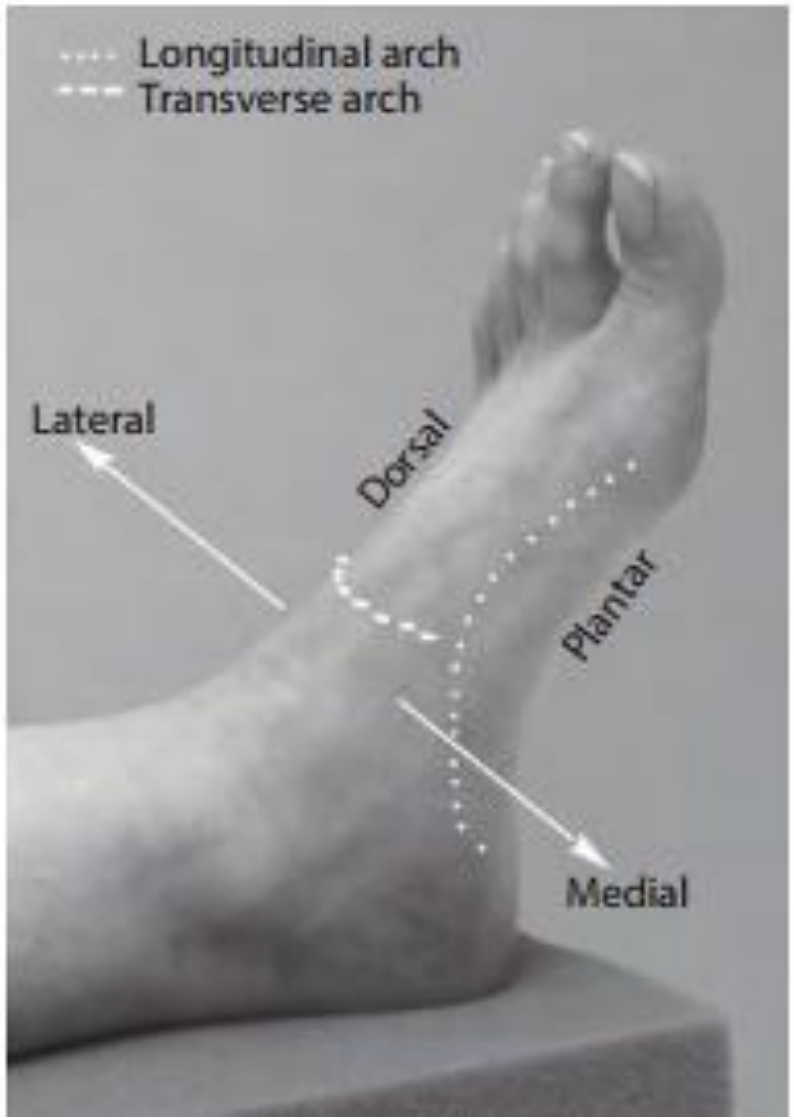
Milad Ali Talib
M.Sc Radiology Technology

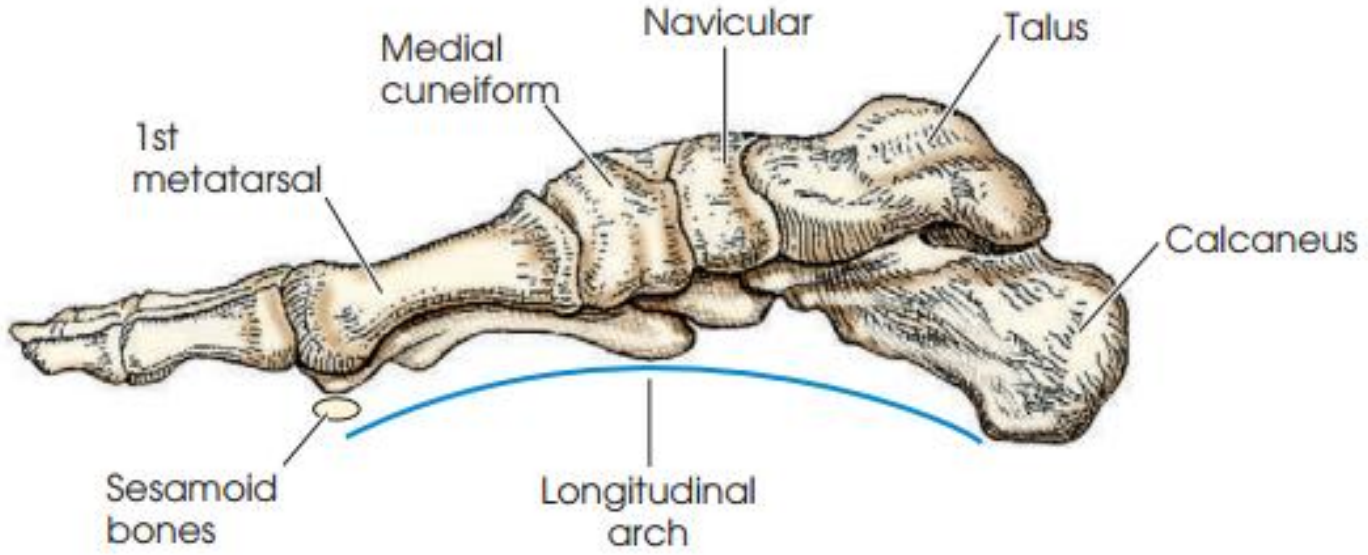


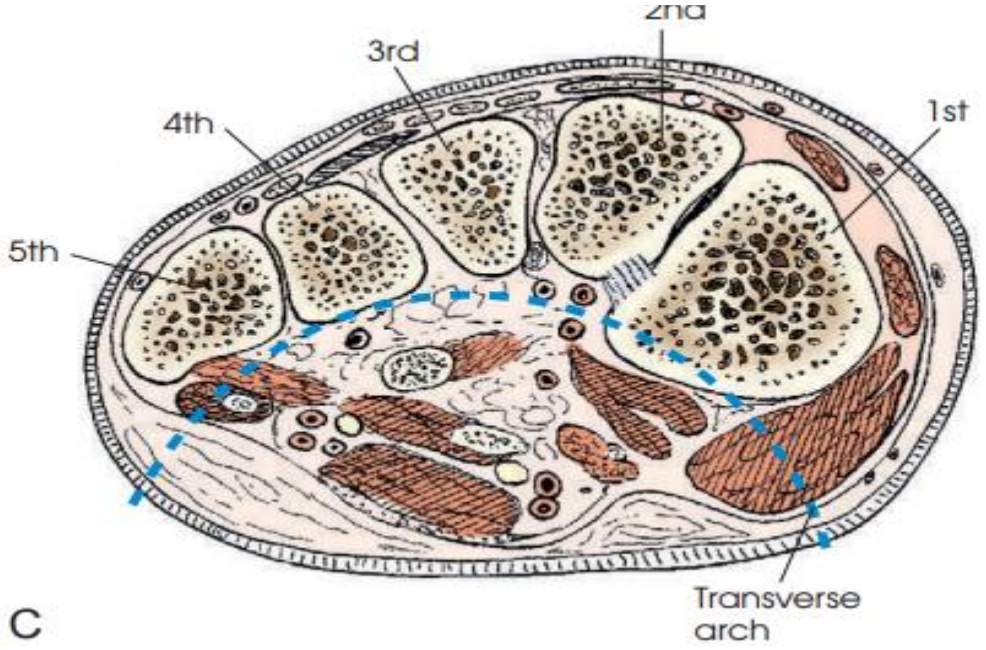
B Lateral view.



A Dorsal (superior) view.


Longitudinal arch
Transverse arch
Lateral
Dorsal
Plantar
Medial


Navicular
Talus
Medial cuneiform
1st metatarsal
Calcaneus
Sesamoid bones
Longitudinal arch


2nd
3rd
4th
1st
5th
Transverse arch
C


Hallux
PHALANGES
distal
middle
proximal
1st Metatarsal
META-
TARSALS
4 Medial cuneiform
5 Intermediate cuneiform
6 Lateral cuneiform
3 Navicular
7 Cuboid
1 Talus
2 Calcaneus
TARSALS
1 TIGER 2 CUBS 3 NEED 4 6 M I L C 5 7

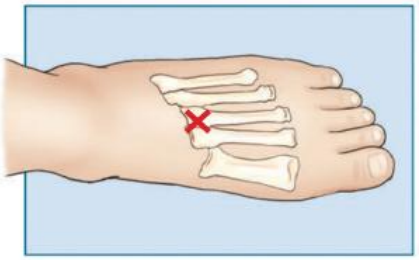
Foot Projections

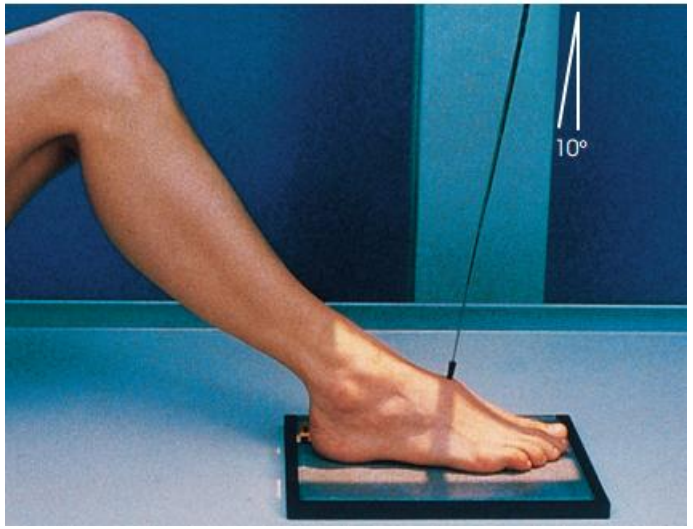
Routine projections:

- AP
- Oblique
- Lateral

Special projection

- Weight-Bearing Feet AP and Lateral





1. AP position(Dorsi-plantar)

Clinical indication:

- Location and extent of fractures and fragment alignments, joint space abnormalities, soft tissue effusions
- Location of opaque foreign bodies

Position

- Supine or seated with plantar surface of foot flat on IR.
- Flex the knee of the affected side enough to rest the foot firmly on the radiographic table.
- long axis of IR is parallel with the long axis of the foot
- Extend (plantar flex) foot by sliding foot and IR distally while keeping plantar surface flat on IR

1. AP position(Dorsi-plantar)

6-year-old patient. Note epiphyseal lines (arrows).

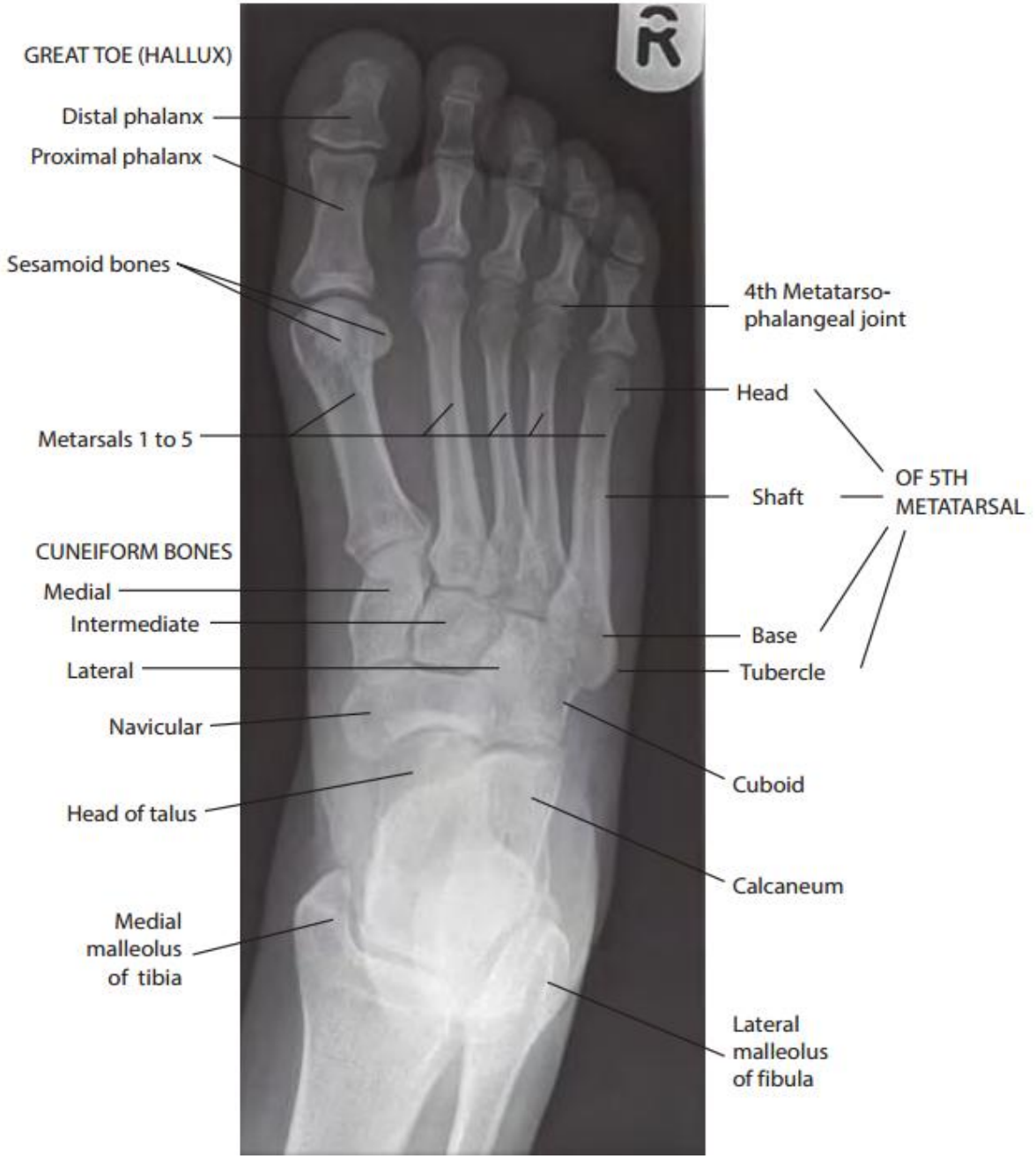
1. AP position(Dorsi-plantar)

Collimation: Four sides to margins of foot
Central Ray: CR ⊥, to metatarsals, which is about 10‘ posteriorly (toward heel), centered to base of 3rd metatarsal

Technique:

Compensating filter
This projection can be improved with the use of a wedge-type compensating filter because of the difference in thickness between the toe area and the much thicker tarsal area

IR: 12 x10″ LW **Grid:** Non **SID:** 102 cm
kVp: 65 **mAs:** 5



2. AP Oblique (Medial Rotation)

Clinical indication:

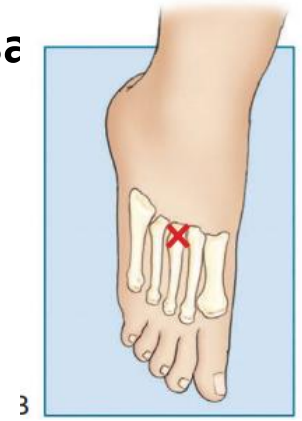
- Location and extent of fractures and fragment alignments, joint space abnormalities soft tissue effusions
- Location of opaque foreign bodies

Position

- Supine or seated with foot centered lengthwise to portion of IR being exposed
- Oblique foot 30°-40° medially, support with 45° radiolucent angle block to prevent slippage
- **Note 1:** A higher arch requires nearer 45° oblique and a low arch "flat foot" nearer 30°.
- **Note 2:** A 30° lateral oblique projection will demonstrate the space between 1st and 2nd metatarsals and between 1st and 2nd cuneiforms.

Collimation: Four sides to margins of foot and distal ankle

Central Ray: CR ⊥, centered to base of 3rd metatarsa



2. AP Oblique (Medial Rotation)

Technique:

IR: 12 x10″ LW **Grid:** Non
SID: 102 cm
kVp: 65 **mAs:** 5

3. Lateral projection (Mediolateral)

Clinical indication:

- Location and extent of fractures and fragment alignments, joint space abnormalities soft tissue effusions
- Location of opaque foreign bodies

Position

- Recumbent, turned on affected side, knee flexed with unaffected leg behind to prevent overrotation
- Place support under affected knee and leg as needed to place plantar surface of foot perpendicular to IR for a true lateral.

Collimation: Four sides to margins of foot and distal ankle

Central Ray: CR ⊥, centered to area of base of third metatarsal

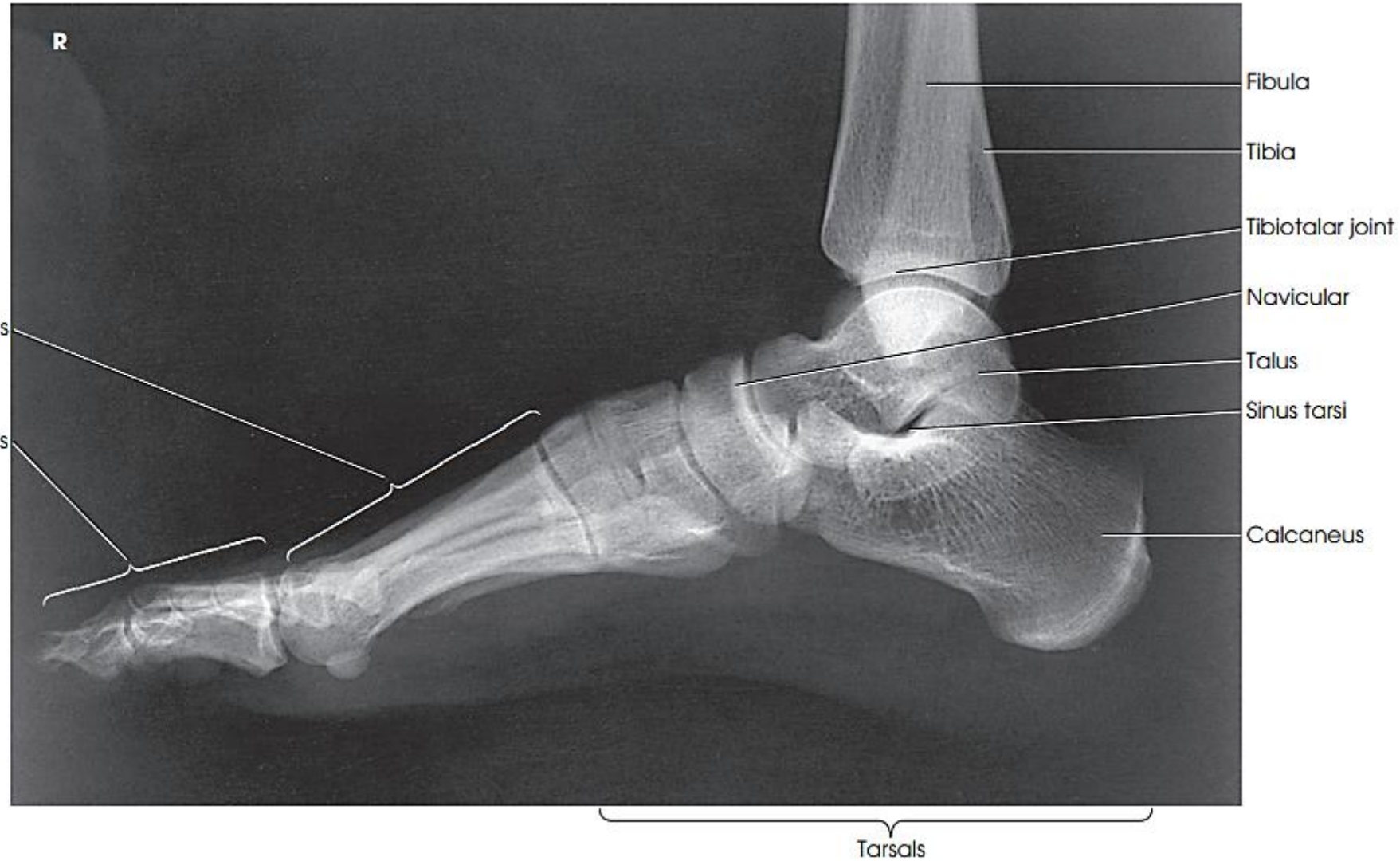
Technique:

IR: 12 x10″ LW **Grid:** Non

SID: 102 cm

kVp: 65 **mAs:** 5

3. Lateral projection (Mediolateral)



Weight-Bearing Feet AP and Lateral\ (Special projection)

Clinical indication:

- Demonstrate the bones of the feet to show the condition of the longitudinal arches under the full weighs of the body.
- Lateral projection is most common for longitudinal arch (flat feet), AP demonstrates alignment of metatarsals and phalanges.

Position:

- **AP:** Erect, weight evenly distributed on both feet, on one IR
- **Lateral:** Erect, full weight on both feet, vertical IR between feet, standing on blocks, high enough from floor for horizontal CR (R and L feet taken for comparison)

Central Ray:

- **AP:** CR 15° posteriorly, CR to level of base of 3rd metatarsal, midway between feet
- **Lateral:** CR horizontal, to base of 5th metatarsal

Collimation: : Four sides to outer skin margins of the feet

B AP-both feet CR 15° posteriorly.

Weight-Bearing Feet AP and Lateral\ (Special projection)

Technique:

IR: 12 x10″ LW, C.W. (14 × 17″) for bilateral study **Grid:** Non

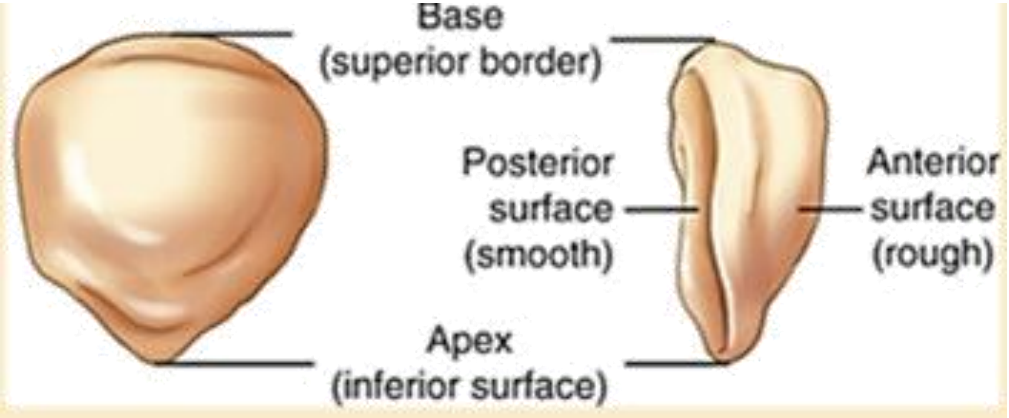
SID: 102 cm **kVp:** 65 **mAs:** 5

Weight-bearing AP both feet, standing

Weight-bearing lateral foot showing centimeter measuring scale built into standing platform.

Lateral projection

Patella projections



Routine projections:

- PA
- Lateral
- Skyline projection

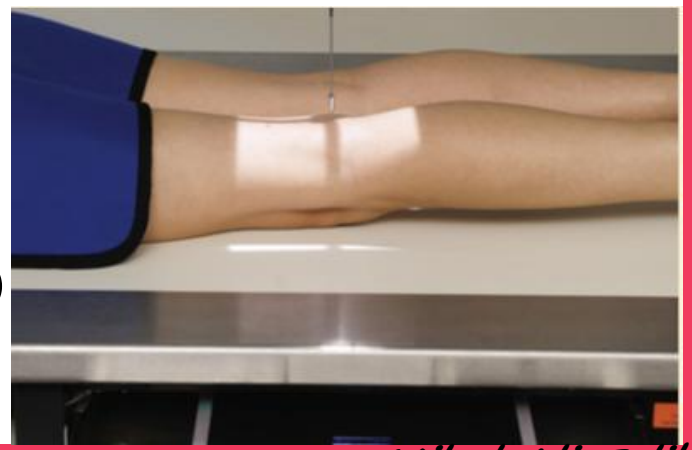
1. postero-anterior, PA

Clinical indication: Evaluation of patellar fractures before the knee joint is flexed for other projections

Position:

- Prone, knee centered to CR and midline of table or IR
- If patella area is painful, place pad under thigh and leg to prevent direct pressure on patella.
- Rotate anterior knee approximately 5° internally or as needed to place an imaginary line between the epicondyles parallel to the plane of the IR. Center IR to CR.

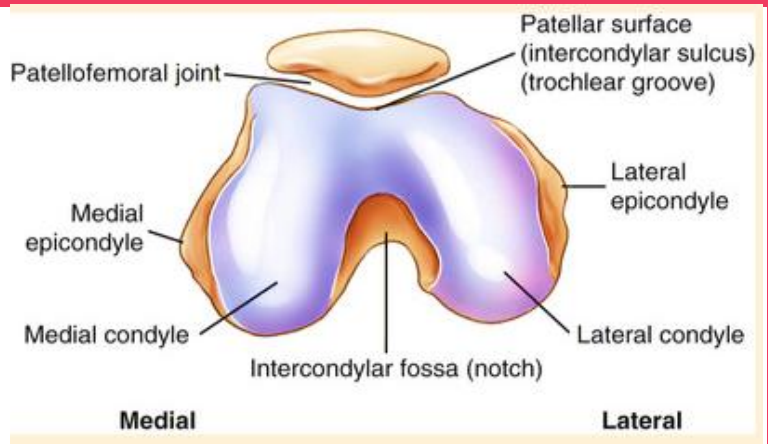
NOTE: An alternative standing PA projection could be considered if the patient is unable to tolerate lying prone on the table.



Central Ray: CR ⊥, centered to central patella region (at midpopliteal crease)

Collimation: To area of patella and knee joint

1. (postero-anterior, PA)



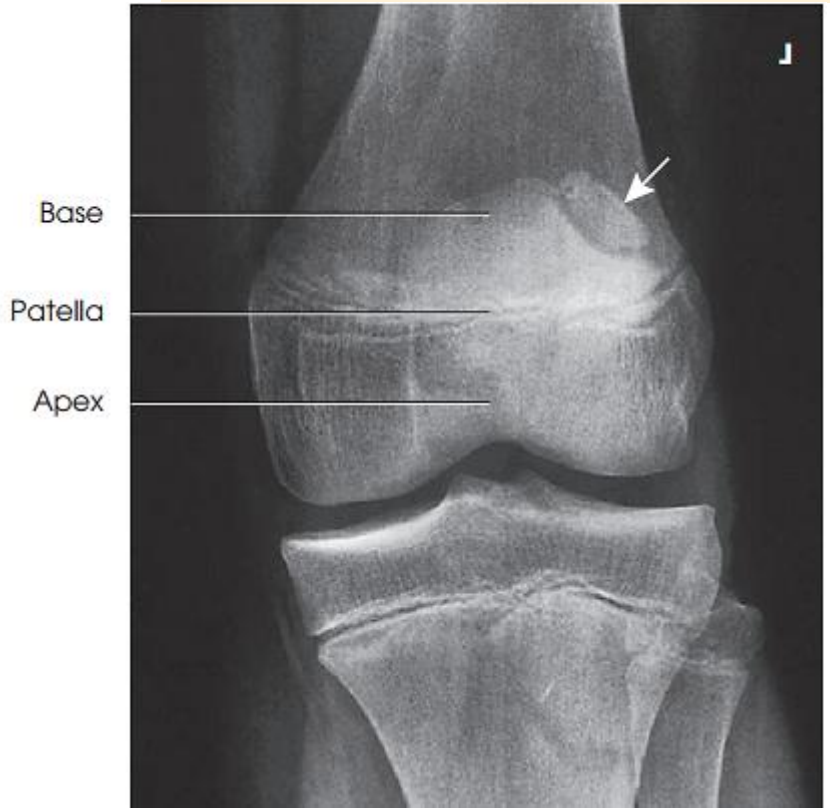
Technique:

IR: 8 x10" LW, **Grid:** Non if thickness < 10cm

SID: 102 cm **kVp:** 70 **mAs:** 5

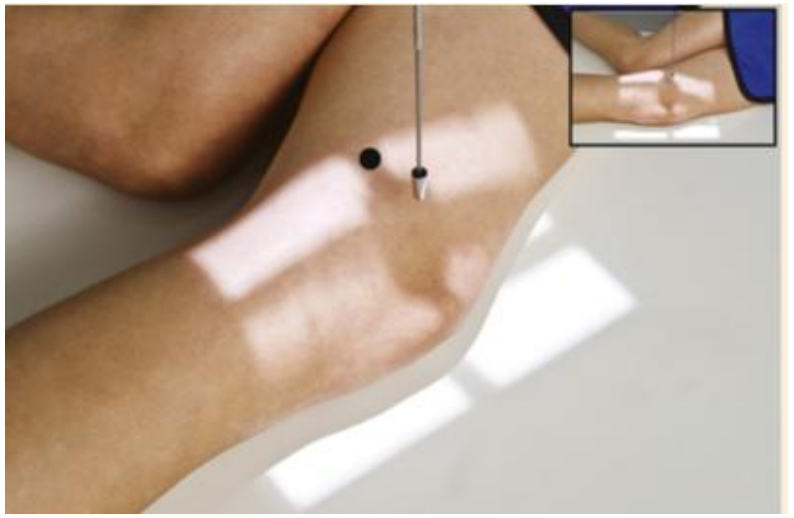
Normal PA radiograph of patella

PA of patella, transverse fracture



AP patella showing fracture (arrow).

2. Lateral



Clinical indication: Evaluation of patellar fractures in conjunction with the PA• Abnormalities of patellofemoral and femorotibial joints

Position:

- Recumbent on affected side, opposite knee, and leg behind to prevent over-rotation
- Flex knee only 5°-10° to prevent separation of fractured fragments if present.
- Patellofemoral joint area centered to CR and midline of IR.

Central Ray: CR ⊥, centered to mid-patellofemoral joint space

Collimation: To area of knee joint, patella, and patellofemoral joint

Technique:

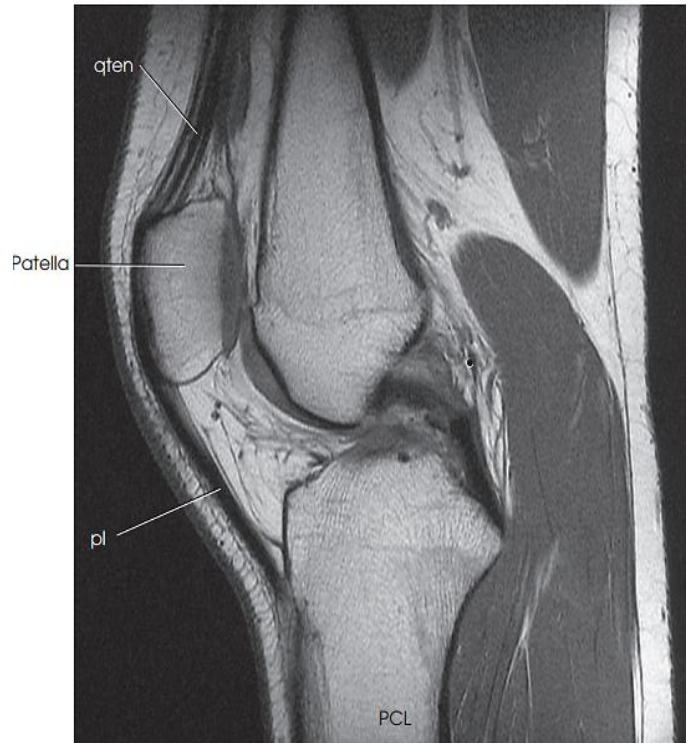
IR: 8 x10" LW **Grid:** Non if thickness < 10cm

SID: 102 cm **kVp:** 70 **mAs:** 5

3. Skyline projection

Clinical indication:

- Assess the retro-patellar joint space for degenerative disease.
- Determine the degree of any lateral subluxation of the patella with ligament laxity.
- Diagnose chondromalacia patellae
- Confirm the presence of a vertical patella fracture in acute trauma.



Sagittal MRI shows patella, patellofemoral joint, and surrounding soft tissues. Quadriceps tendon (qten) and patellar ligament (pl) are shown on this image

A. Supero-inferior

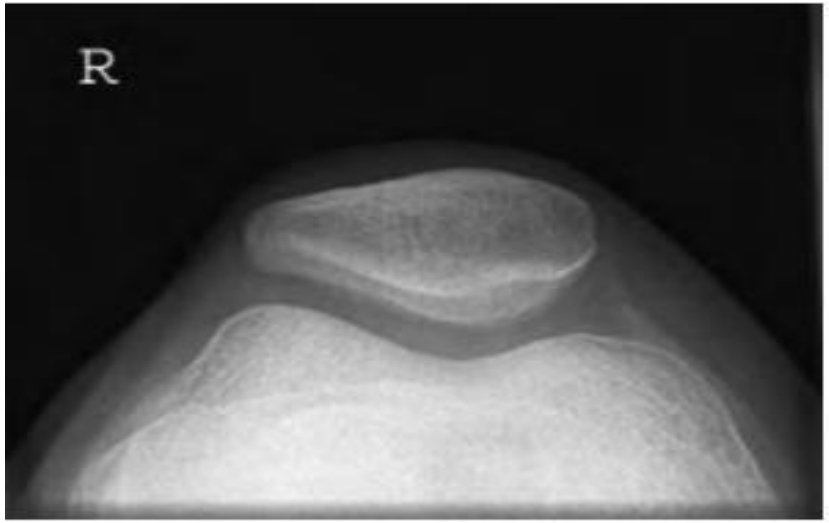
Position:

- Patient sits with the affected knee flexed at 45° over the side.
- A cushion may be used for optimal positioning.
- The IR is horizontally on a stool at the inferior tibial tuberosity level.
- IR is positioned horizontally with the patient seated on a chair

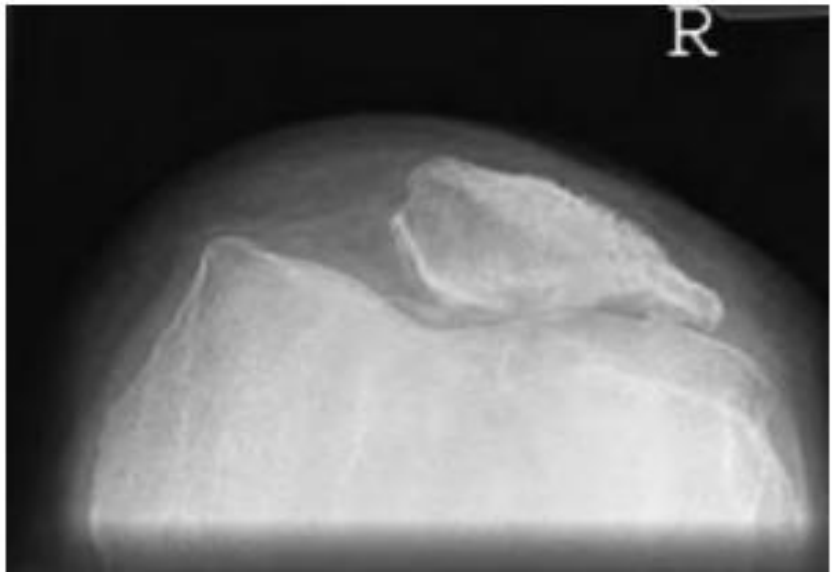
Central Ray: The vertical central beam is directed at the posterior aspect of the proximal patella.

Collimation The beam is parallel to the patella's long axis and collimated to include the patella and femoral condyles.

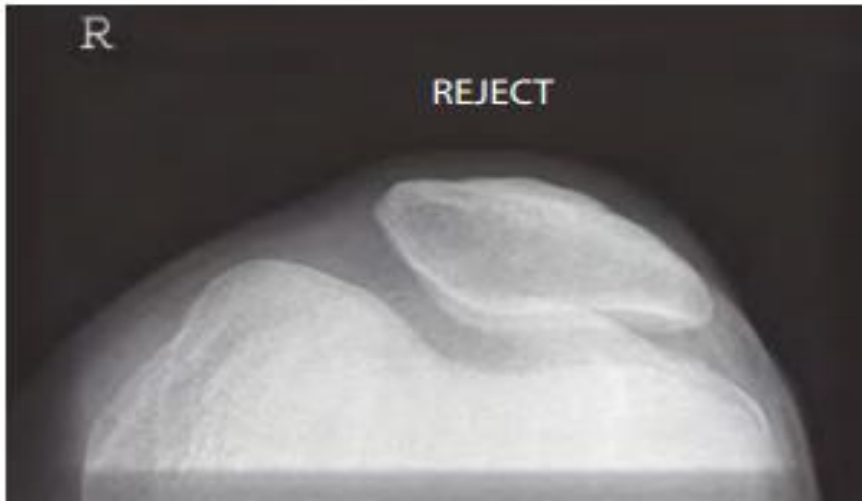
A. Supero-inferior



Normal skyline of knee



Supero-inferior image, advanced degenerative changes; the knee has been flexed too much, giving the appearance of lateral subluxation.



Too little flexion, causing the tibia to be projected over the patella.

B. Infero-superior

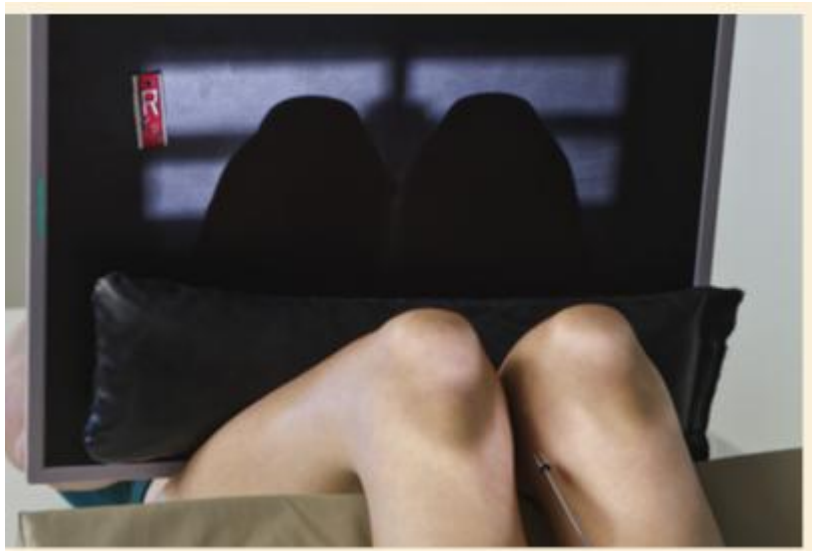
Patient Positioning

- Patient sits on the X-ray table with the knee flexed 30–45°, supported by a pad.
- The IR is held against the anterior distal femur, supported by a non-opaque pad on the thigh.

Central Ray: The X-ray tube is positioned horizontally, avoiding the feet.

- The CR is directed cranially through the apex of the patella, parallel to its long axis, with a 5–10° cranial angle if needed.

Collimation: Focuses on the patella and femoral condyles to minimize scatter radiation.

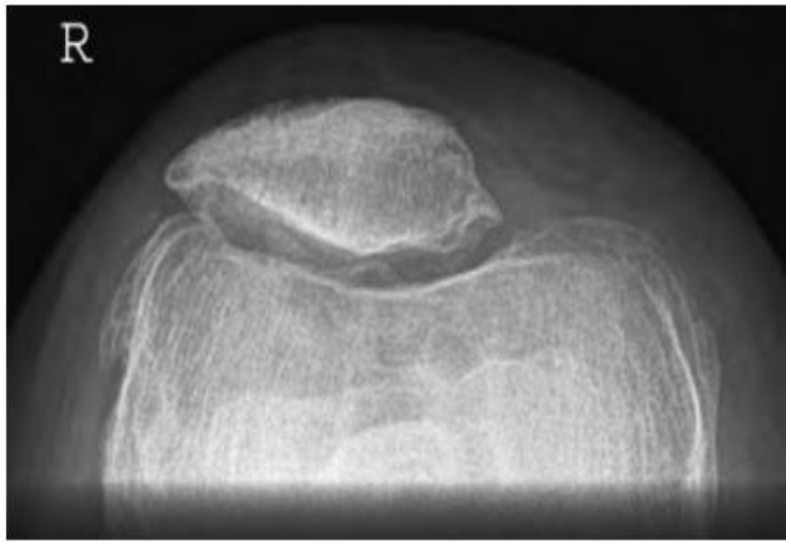


B. Infero-superior

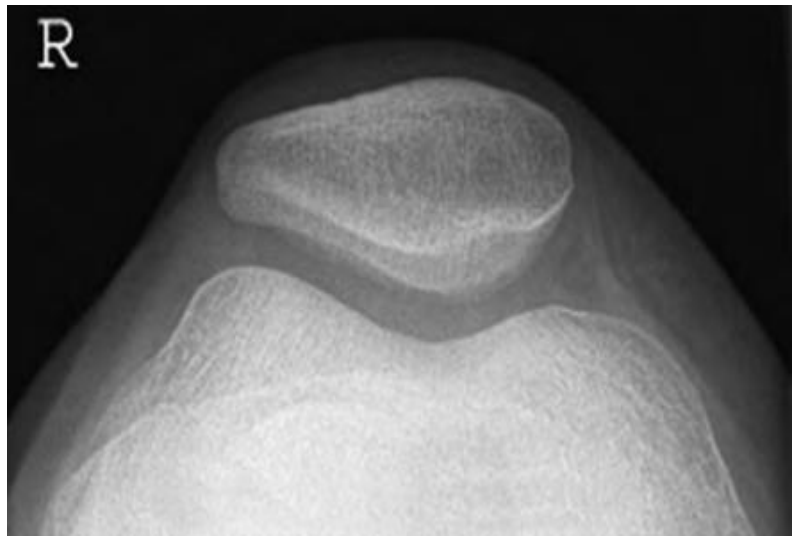
Technique:

IR: 12 x10" LW, C.W. (14 × 17") for bilateral study **Grid:** Non

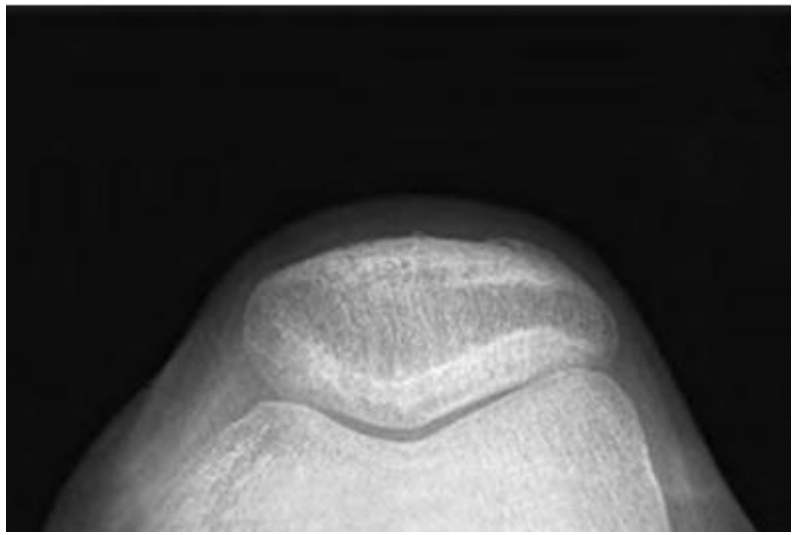
SID: 102 cm **kVp:** 65 **mAs:** 5



Infero-superior, demonstrating good position, osteophytosis affecting the retro-patellar joint.



Infero-superior projection, 30° flexion



Infero-superior projection, 60° flexion

Thank you