SAWA UNIVERSITY

RADIOGRAPHIC TECHNIQUE-1

TIBIA AND FIBULA RADIOGRAPHY

Sawa University

College of health and medical techniques

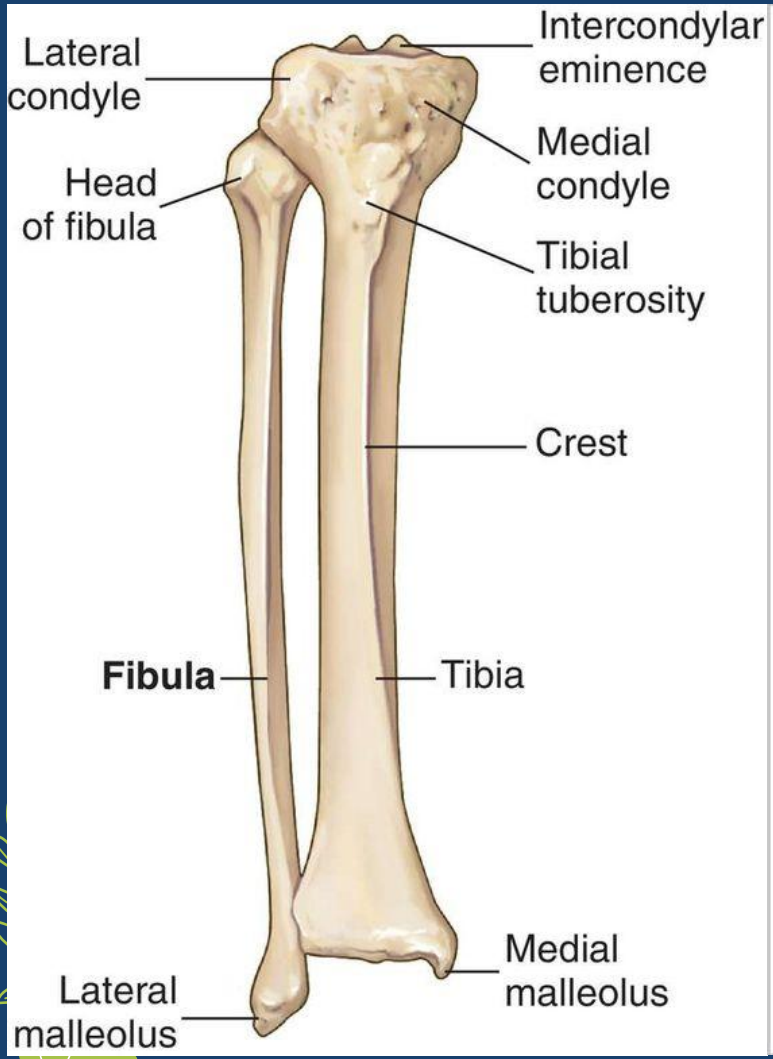
Department of Radiology Tech.

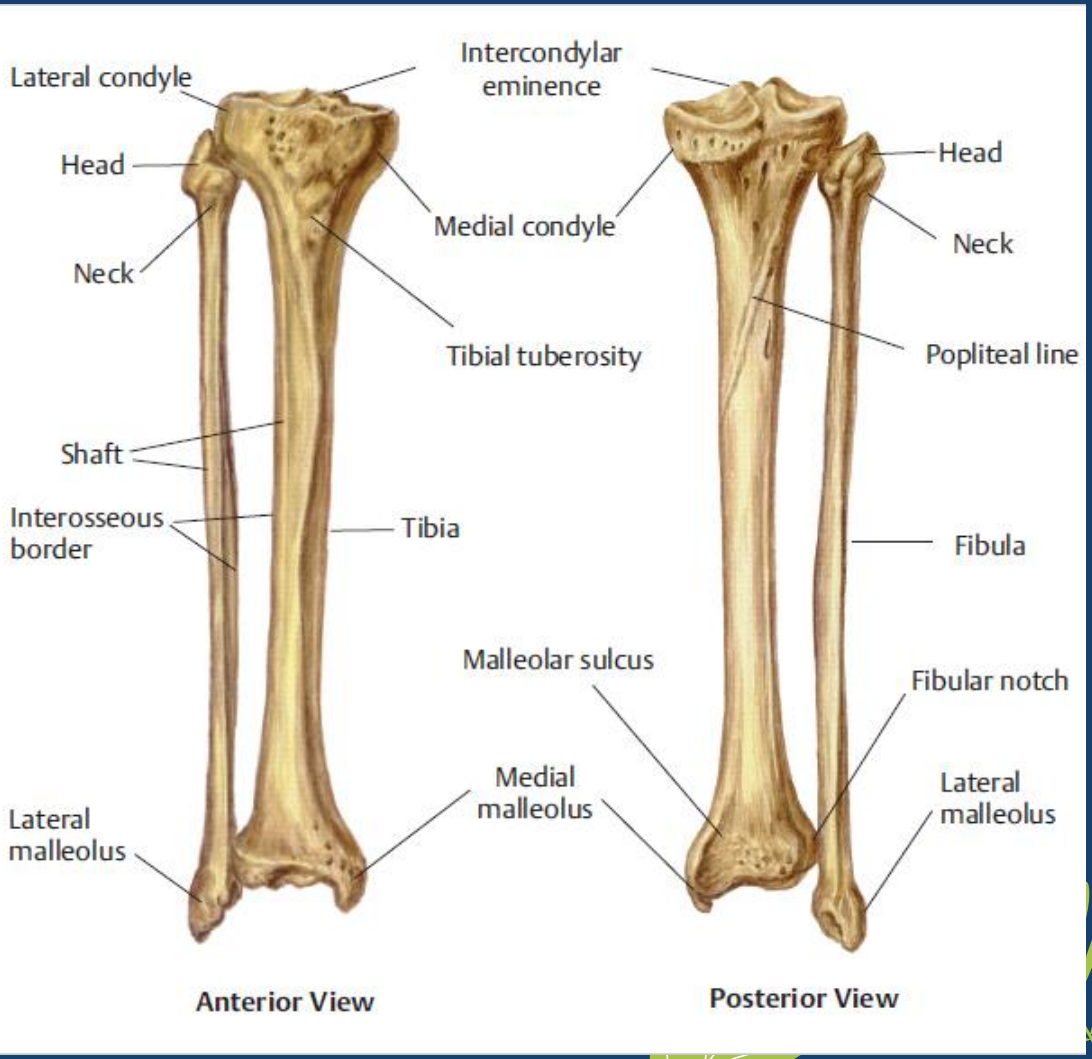
2nd Academic year

LEC.5

THEORTICAL

Milad Ali Talib
M.Sc Radiology Technology


Lateral condyle
Intercondylar eminence
Medial condyle
Head of fibula
Tibial tuberosity
Crest
Fibula
Tibia
Medial malleolus
Lateral malleolus


Lateral condyle
Intercondylar eminence
Head
Medial condyle
Neck
Tibial tuberosity
Shaft
Interosseous border
Tibia
Lateral malleolus
Anterior View
Head
Neck
Popliteal line
Fibula
Malleolar sulcus
Fibular notch
Medial malleolus
Lateral malleolus
Posterior View

Leg (Tibia and Fibula)

Routine projections:

- AP
- Lateral — Mediolateral Projection

AP projections

Clinical Indications:

Pathologies involving fractures, foreign bodies, or lesions of the bone

Position

- Supine, leg extended, ensure no rotation of knee, leg, or ankle.
- Flex the ankle until the foot is in the vertical position.
- Include 3cm beyond knee and ankle joints.

Central Ray: CR perpendicular to midshaft of leg.

Collimation: On four sides, to include knee and ankle joints.

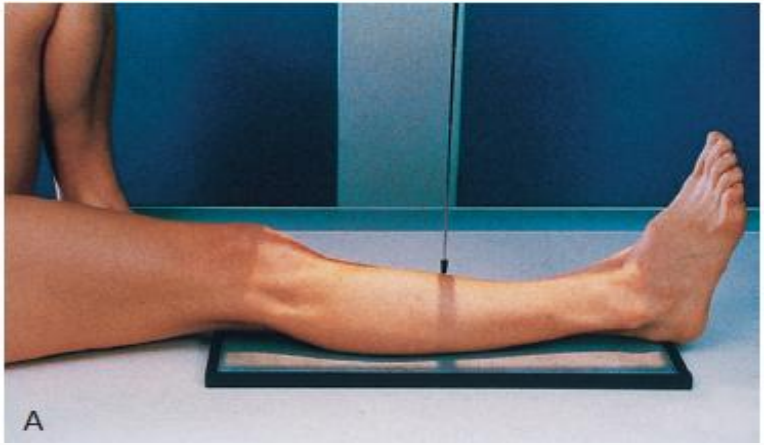
AP projections

Technique:

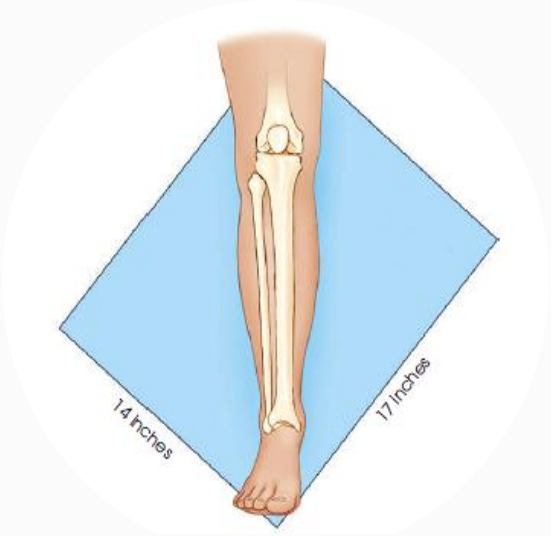
Correct use of anode heel effect results in an image with nearer equal density at both ends of IR.

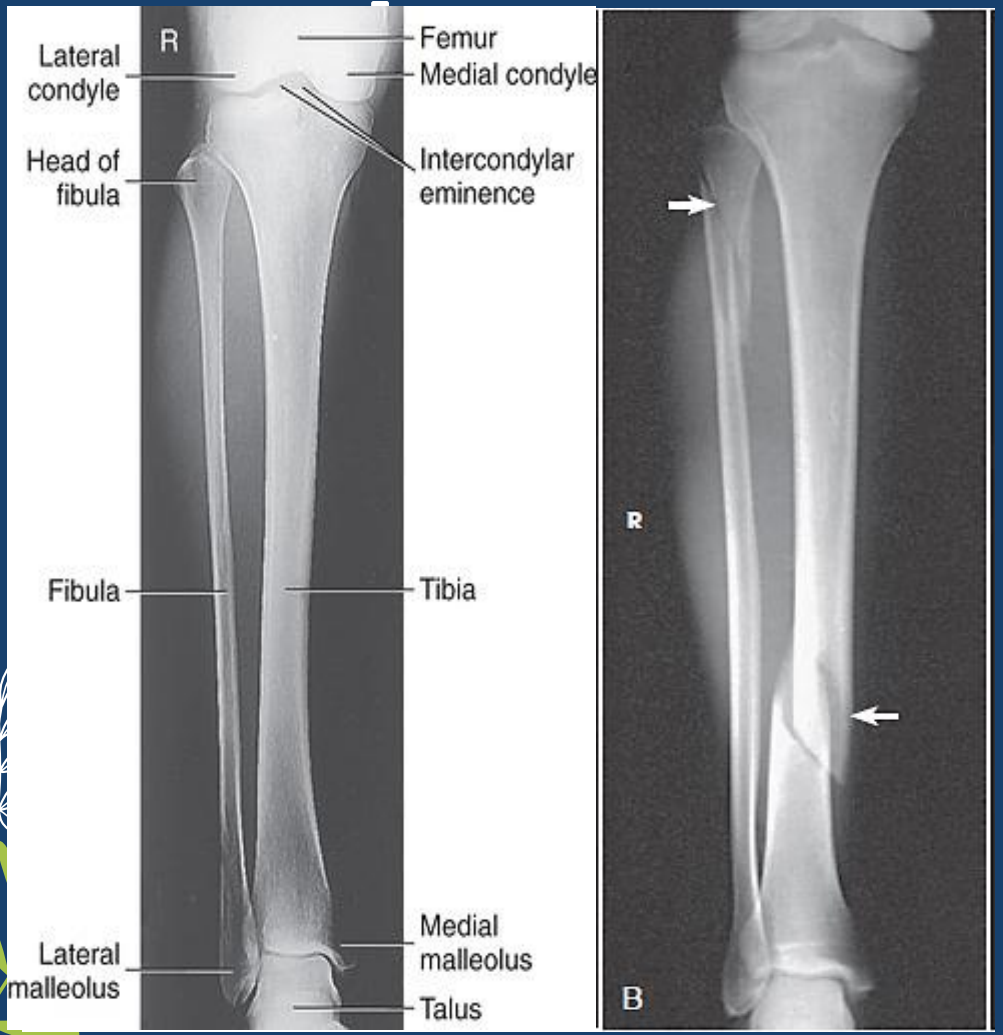
IR: 14 x17″ LW **Grid:** No if less than 10 cm **SID:** 102 cm

kVp: 50 **mAs**: 5



A, AP tibia and fibula.





A. Normal leg bones.
B. Spiral fracture of distal tibia with accompanying spiral fracture of proximal fibula (*arrows*)

Lateral — Mediolateral Projection

Clinical Indications:

- Localization of lesions and foreign bodies and determination of extent.
- Demonstrate alignment of fractures.

Position

- Recumbent, affected side down
- Place unaffected limb behind patient to prevent over-rotation.
- Ensure a true lateral position of foot, ankle, and knee. (plane of patella should be perpendicular to IR)
- Include 3cm beyond knee and ankle joints

Central Ray: CR ⊥, to midshaft of leg

Collimation: On four sides, to include knee and ankle joints

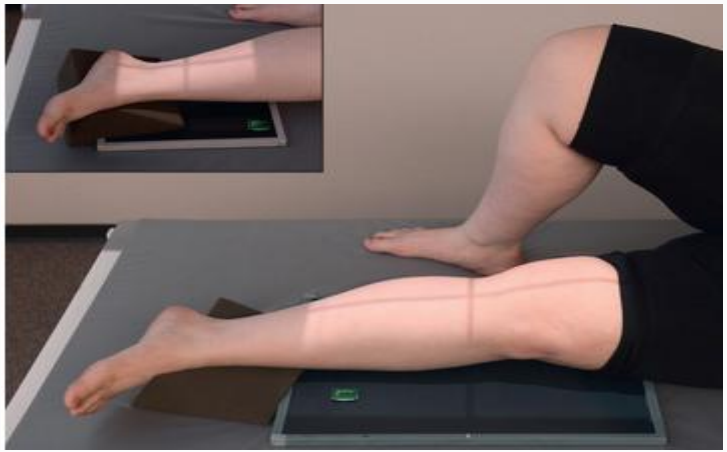
Lateral — Mediolateral Projection

Technique:

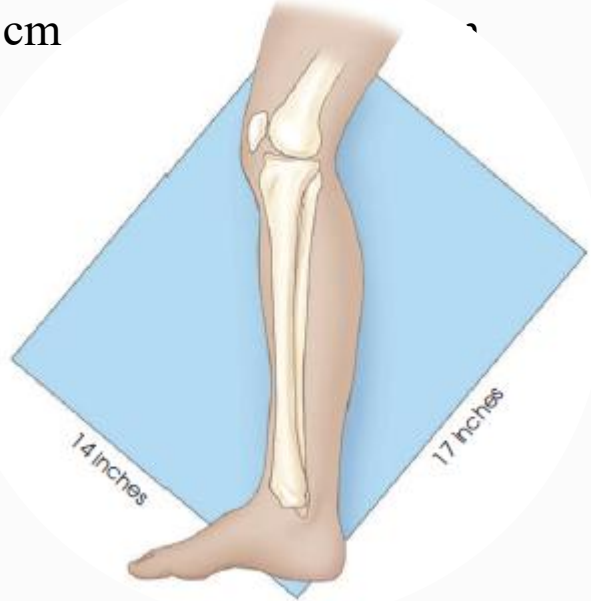
Correct use of anode heel effect results in an image with nearer equal density at both ends of IR.

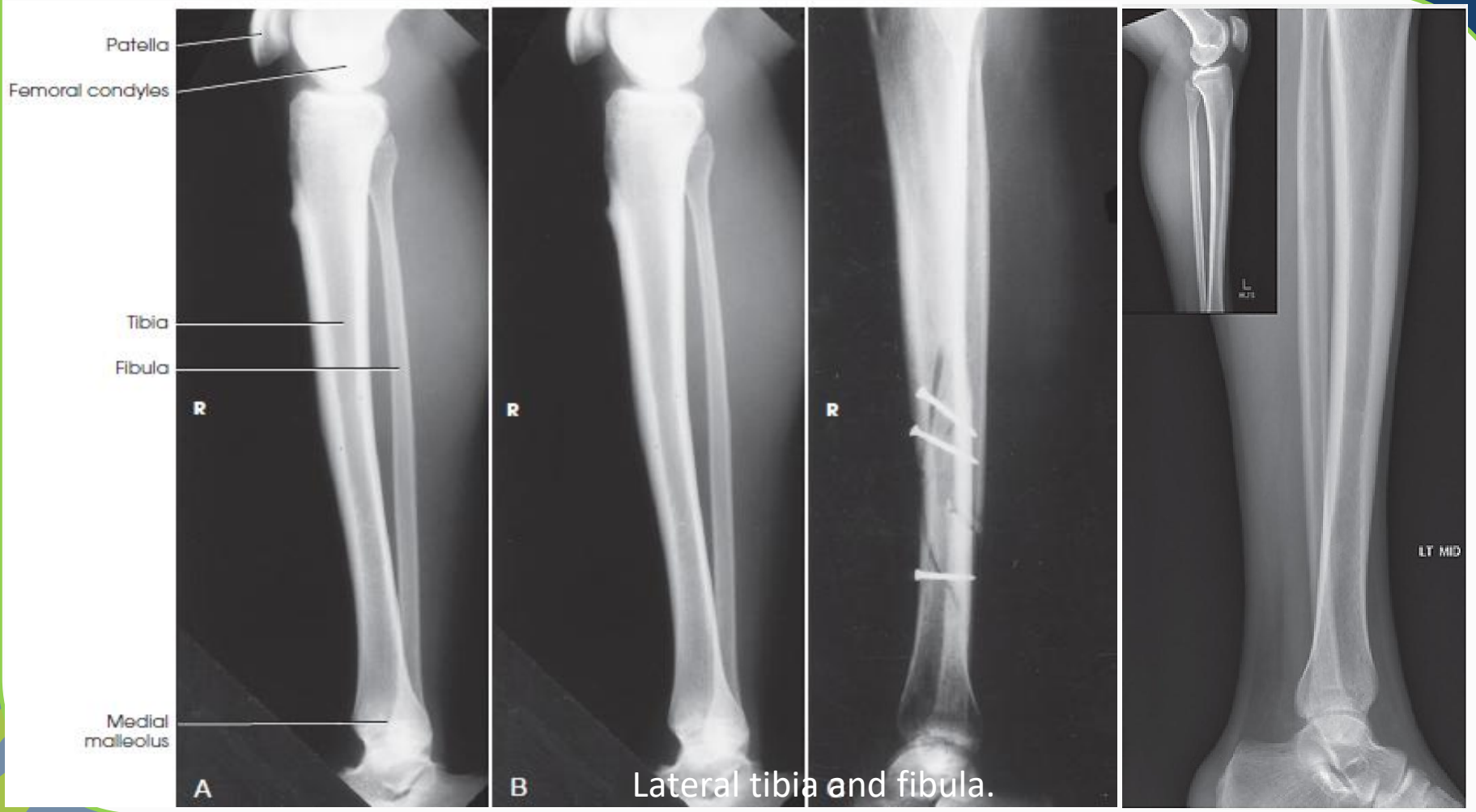
IR: 14 x17″ LW **Grid:** No if less than 10 cm

kVp:50 **mAs:** 5

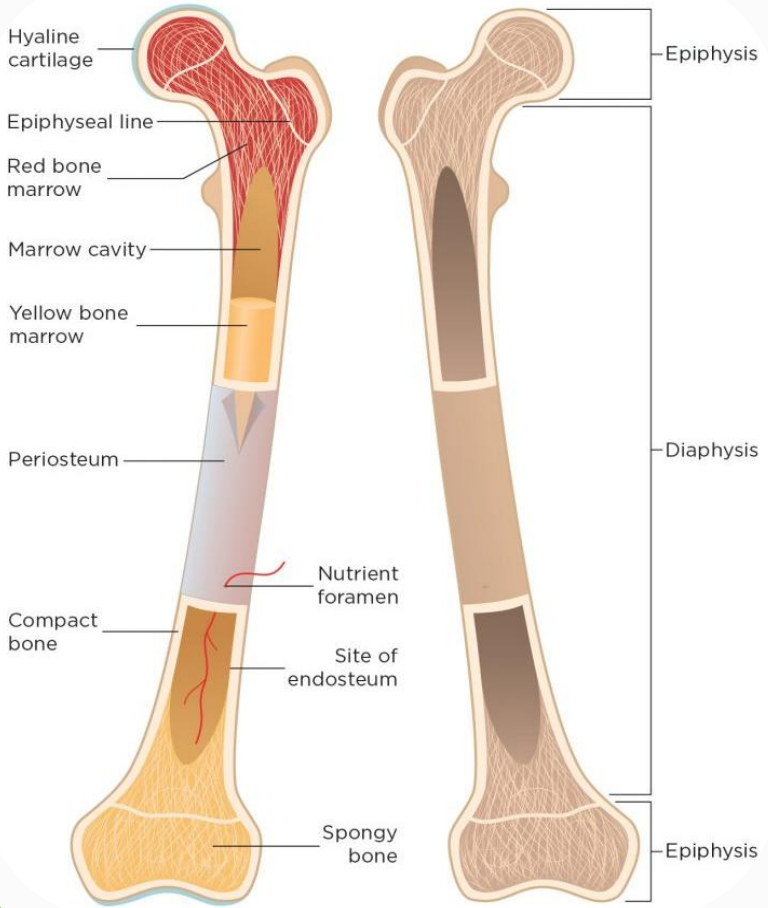


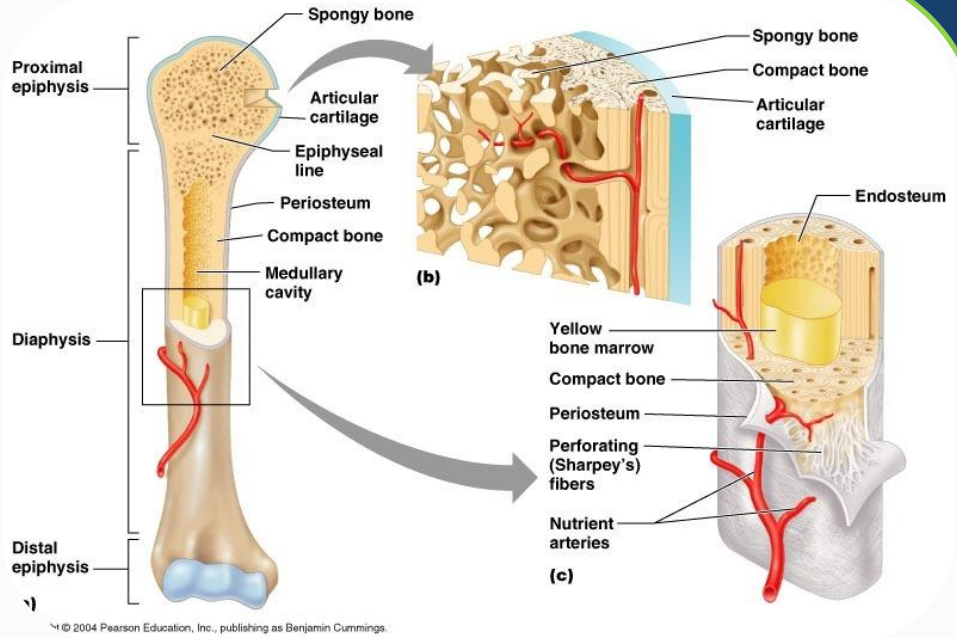
Lateral tibia and fibula.





Lateral tibia and fibula.

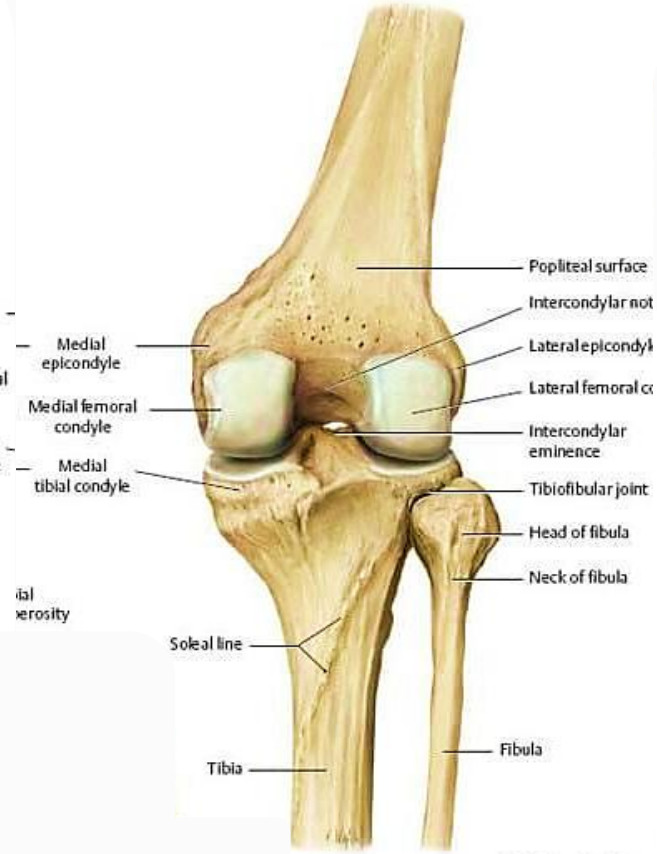




Lateral tibia and fibula.

Knee Joint

Anterior view.



B Posterior view.

C Lateral view.

Knee Joint Projections

Routine projections:

- AP
- Lateral
- Oblique

Special projection:

- AP bilateral weight-bearing

AP projections

Clinical Indications:

- Fractures, lesions, or bony changes related to degenerative joint disease involving the distal femur, proximal tibia and fibula, patella, and knee joint arthritis.

Position:

- Patient in supine, or seated on table, with leg extended and centered to CR and midline of IR
- Rotate leg slightly inward as needed to place knee and leg into a true AP.
- Center IR to CR.

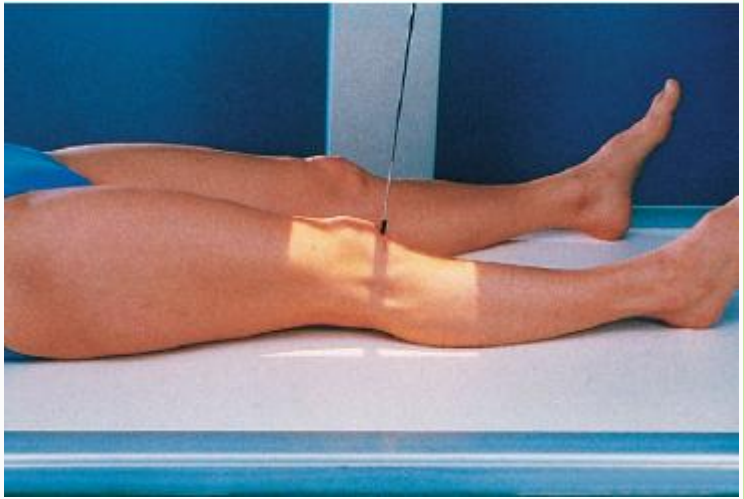
AP projections

Central Ray: CR perpendicular to 1.25 cm inferior to apex of patella.

Collimation: On four sides, to include knee joints.

NOTE: A suggested guideline for determining that CR is parallel to articular facets (tibial plateau) for open joint space is to measure distance from anterior superior iliac spines (ASIS) to tabletop (TT) to determine CR angle as follows:

- <19 cm → 3-5 degrees *caudad* (thin pelvis)
- 19-24 cm → 0 degrees
- >24 cm → 3-5 degrees *cephalad* (large pelvis)



AP projections

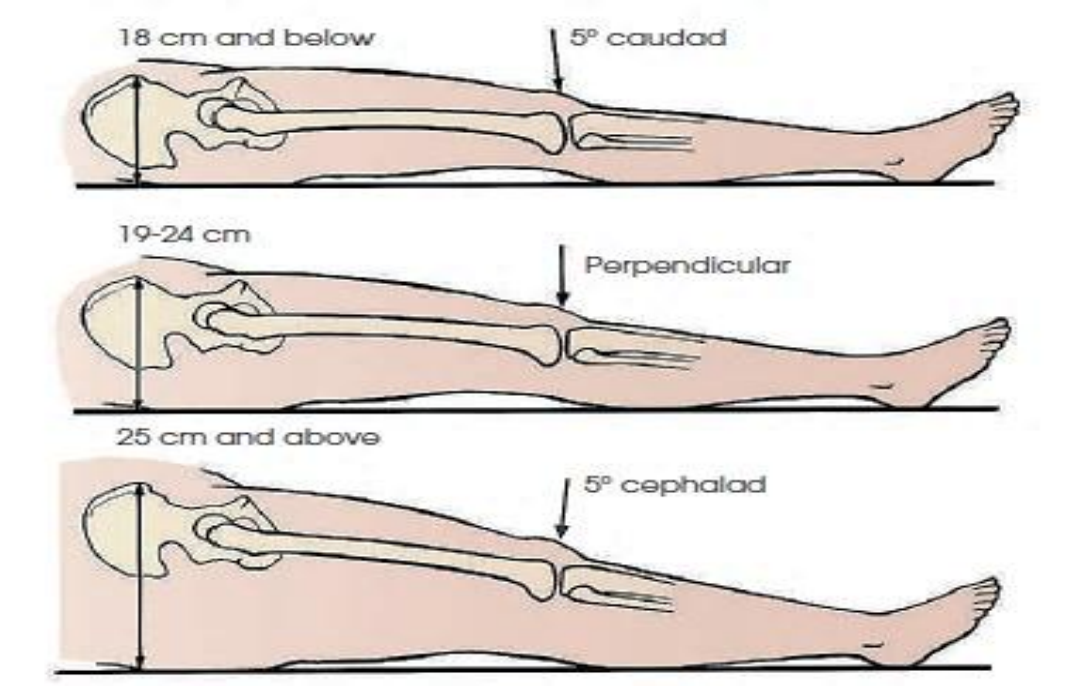
Technique:

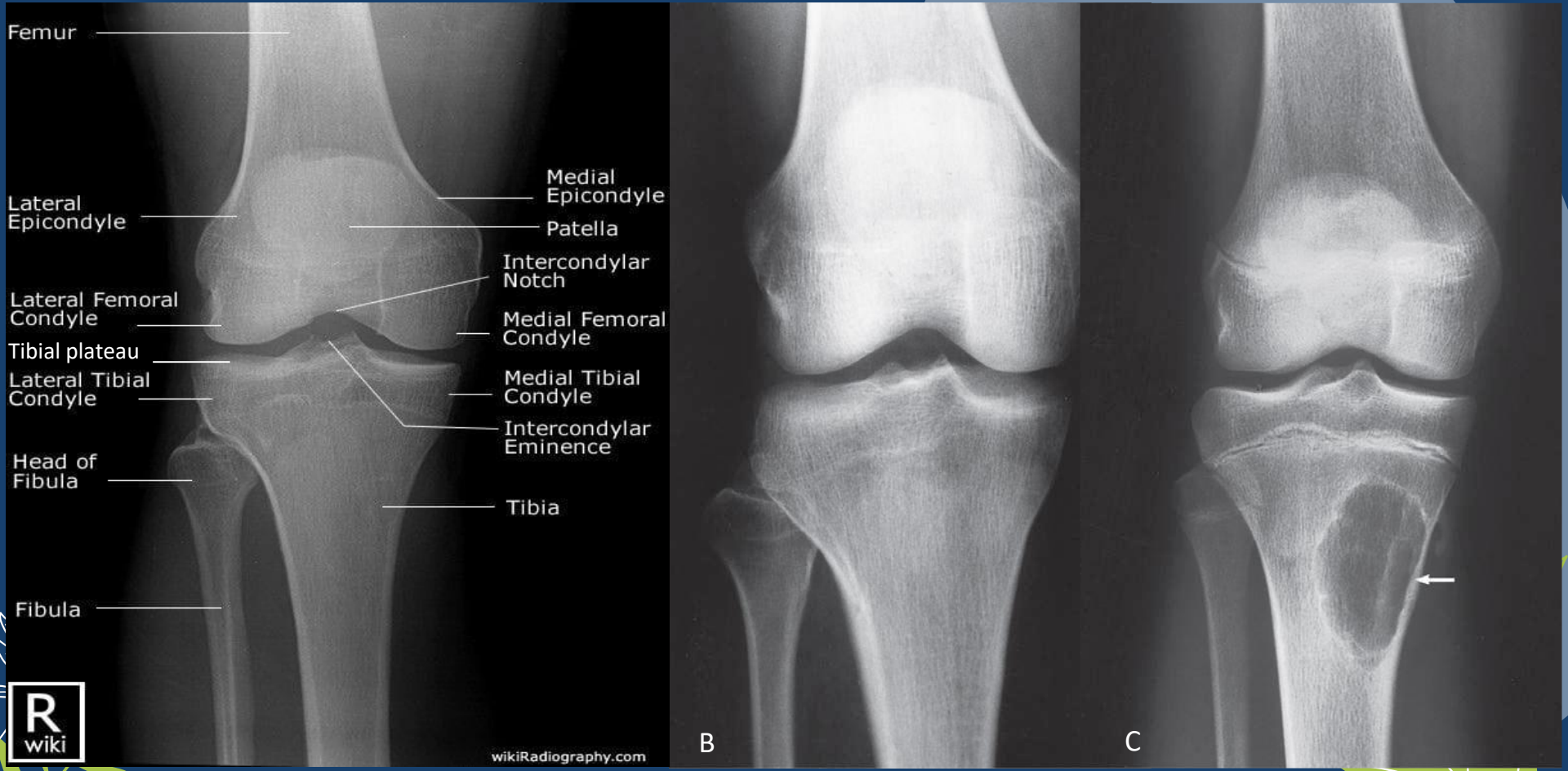
Correct use of anode heel effect results in an image with nearer equal density at both ends of IR.

IR: 12 x10″ LW **SID:** 102 cm

kVp:60 **mAs:** 8

Grid: No if less than 10 cm





A, AP knee with CR angled 5 degrees cephalad. Patient's ASIS-to-tabletop distance was greater than 25 cm.
B, Same patient as in A with CR perpendicular. Note that joint space is not opened as well.
C, AP knee on a 15-year-old. *Arrow* is pointing to a benign lesion in the tibia.

Lateral — Mediolateral Projection

Clinical Indications: Fractures, lesions, ligament injury, arthritis, degenerative joint disease, and joint space abnormalities

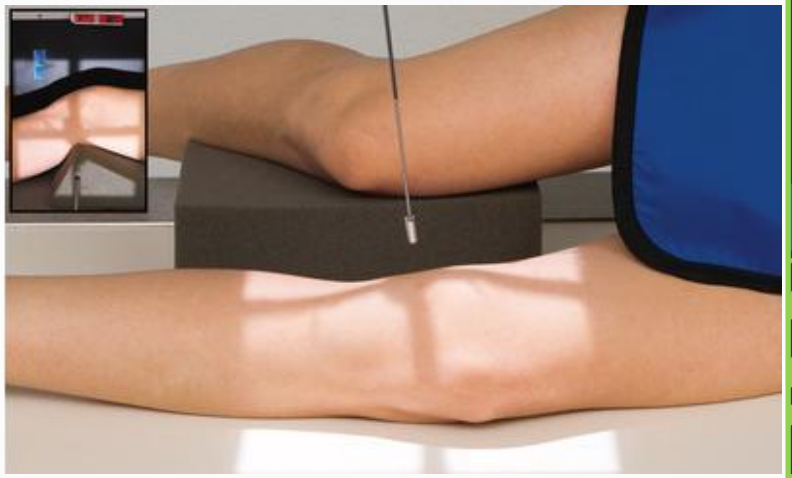
Position

- Patient on affected side, knee flexed ≈20° centered to CR and midline of IR
- Unaffected leg and knee placed behind to prevent over-rotation
- Place support under affected ankle and foot if needed. Center IR to CR.

Central Ray: CR 5°-7° cephalad, CR centered to 2.5 cm distal to medial epicondyle

Collimation: Sides to skin borders, ends to borders of IR

Note: CR parallel to articular facets (tibial plateau)



Lateral — Mediolateral Projection

Technique:

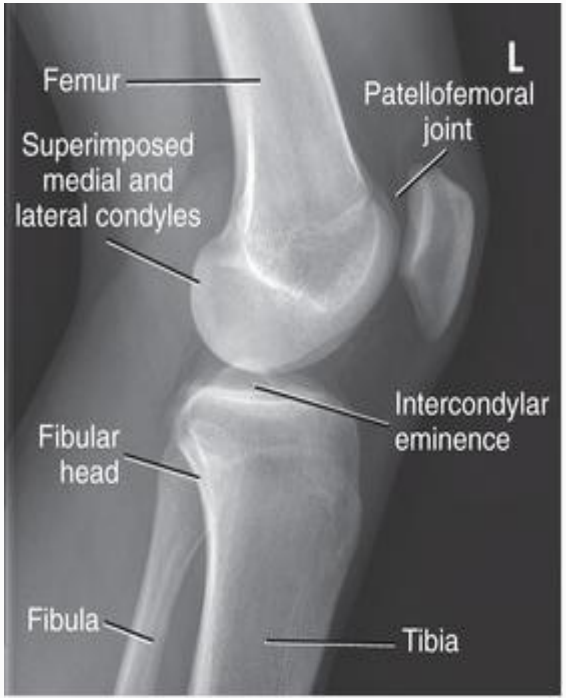
Correct use of anode heel effect results in an image with nearer equal density at both ends of IR.

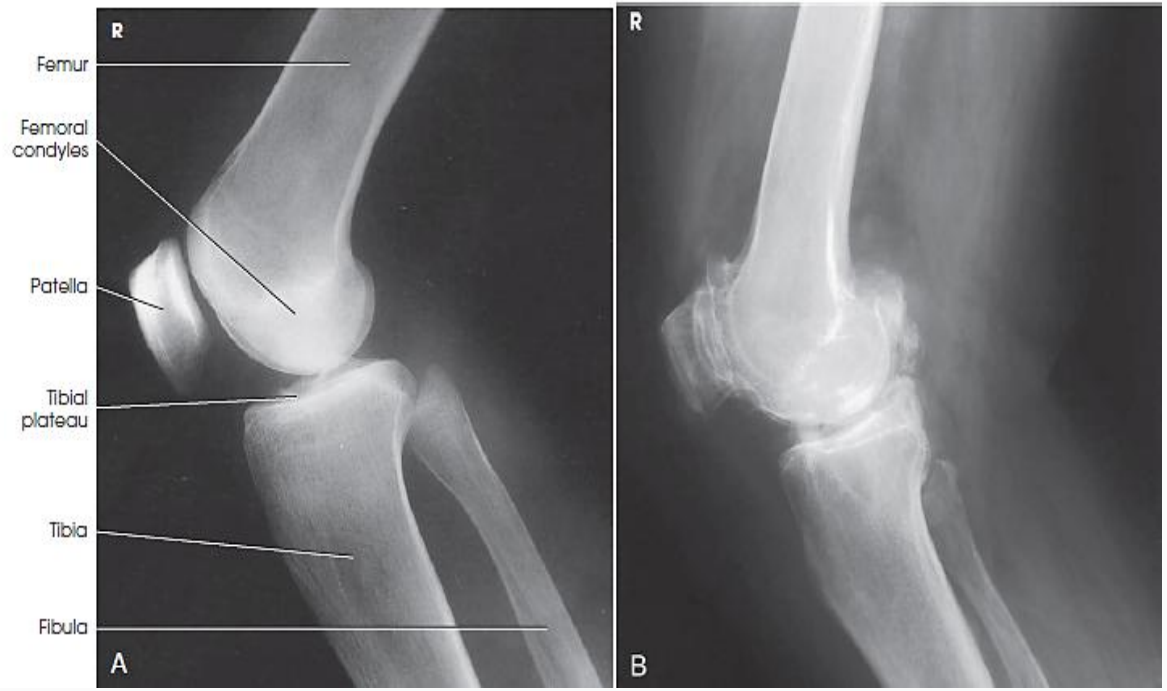
IR: 12 x10″ LW **SID:** 102 cm

kVp: 62 **mAs:** 8

Grid: No if less than 10 cm

Lateral — Mediolateral Projection





Lateral knee.

B, Lateral knee showing severe arthritis

AP bilateral weight - bearing

Clinical Indications: Femorotibial joint spaces of the knees demonstrated for possible cartilage degeneration or other knee joint pathologies

Note: Bilateral knees included on same exposure for comparison

Position

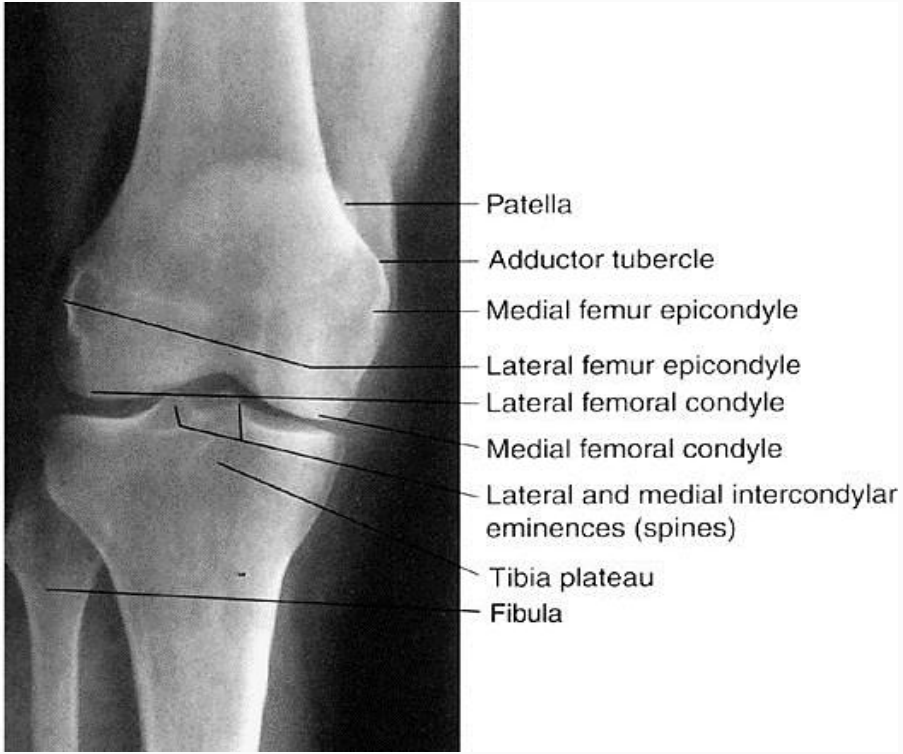
- Erect, standing on footboard as needed (high enough to get x-ray tube low for horizontal beam)
- Feet straight ahead, knees straight, weight distributed evenly on both feet. Have patient hold onto table handles for support.

Central Ray: CR to midpoint between knee joints, at level of 1.25 cm distal to apex of patellae

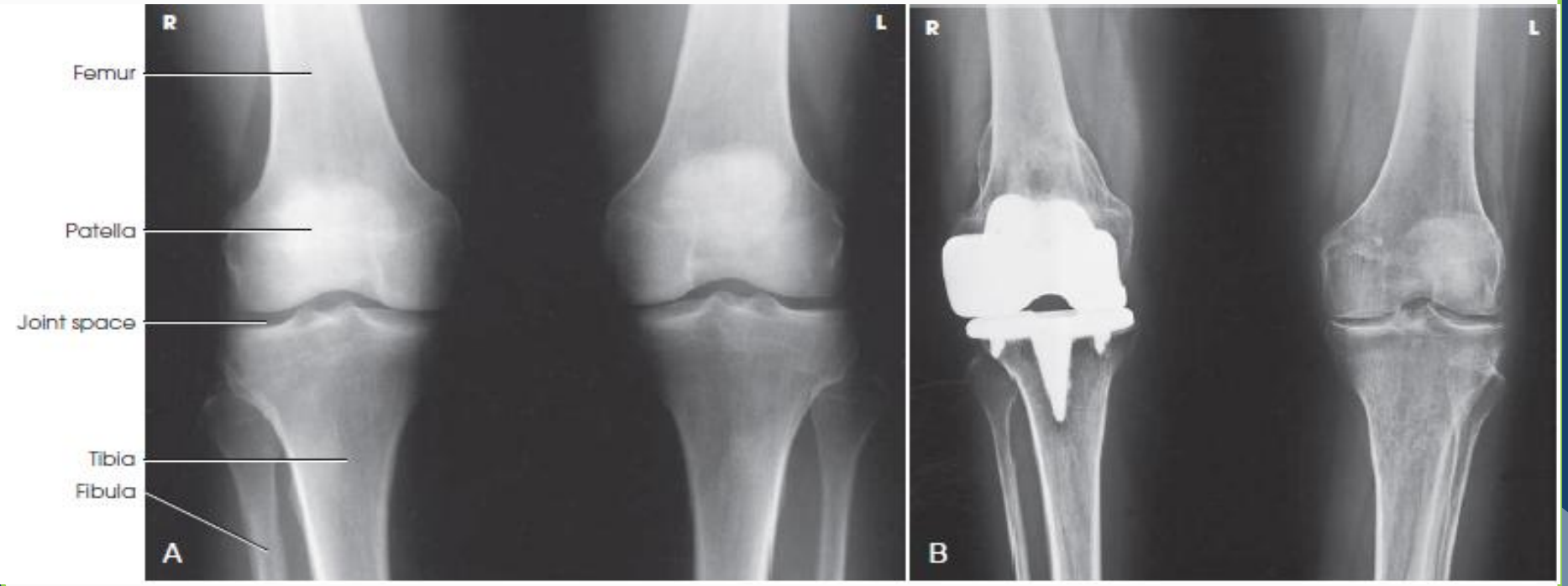
AP bilateral weight - bearing

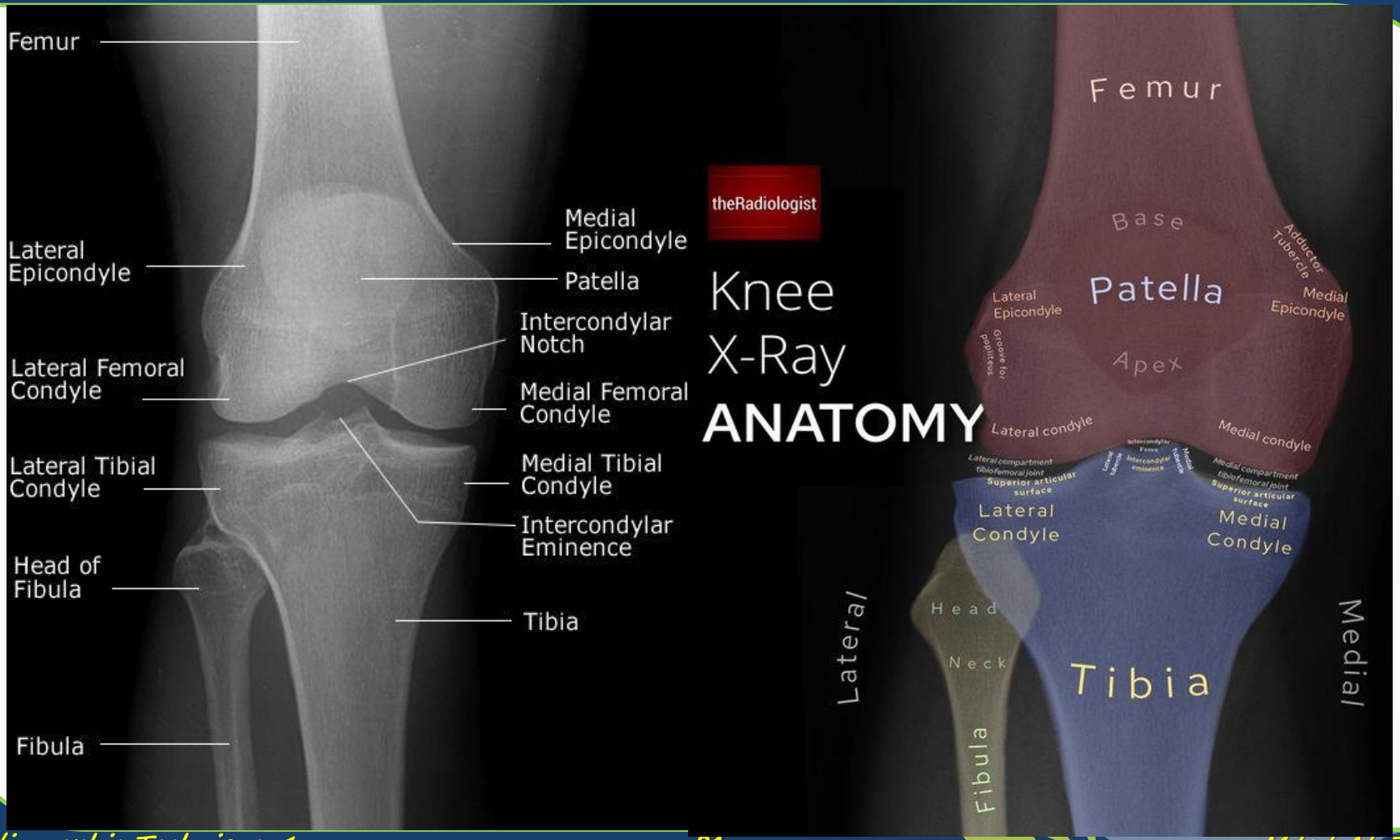
AP: CR horizontal, ⊥ to IR on average patient
PA: CR 10° caudad
Collimation: To bilateral knee joint region

Technique:
IR: 14 x17″ LW **SID:** 102 cm
kVp: 66 **mAs**: 12
Grid: YES



AP bilateral weight - bearing




Femur
Lateral Epicondyle
Lateral Femoral Condyle
Lateral Tibial Condyle
Head of Fibula
Fibula
Medial Epicondyle
Patella
Intercondylar Notch
Medial Femoral Condyle
Medial Tibial Condyle
Intercondylar Eminence
Tibia
theRadiologist
Knee
X-Ray
ANATOMY
Femur
Base
Adductor Tubercle
Lateral Epicondyle
Patella
Medial Epicondyle
Groove for popliteus
Apex
Lateral condyle
Medial condyle
Lateral compartment tibiofemoral joint
Superior articular surface
Intercondylar Fossa
Medial compartment tibiofemoral joint
Superior articular surface
Lateral Condyle
Medial Condyle
Lateral
Head
Neck
Tibia
Medial
Fibula


fibrous dysplasia
Ewing sarcoma
osteochondroma
pedunculated
sessile
cauliflower
enostosis/bone island
enchondroma
chondroblastoma
osteomyelitis or
other aggressive lesion
osteosarcoma
simple/unicameral
bone cyst
aneurysmal bone cyst
non-ossifying fibroma
osteoid osteoma

Don’t stop until you’re proud