

## Projections

Region	Basic projections	Additional / Modified projections
Feet	AP; Obl.	Lat.
Toes	AP; Obl.	
Big toe	AP; Lat.	
Ankle	AP; Lat.	Obls.
Calcaneum	Lat; Axial	
Heel	Lat.	
Lower leg	AP; Lat.	
Knee	AP; Lat	Tunnel's; obl.; standing AP
Patella	PA; Lat.; Skyline	Obls.
Femur	AP; Lat.	
Hip	AP; Lat.	
Pelvis	AP	Frog's; AP erect



## Pathological considerations

? arthritis; ? gout ; ? FB; ? hallux valgus; etc.

## **Radiographing techniques**

### ***Feet***

#### AP

The patient is seated on the couch with the knees flexed and the sole of the foot is rested on the cassette.

The ankle joint is extended to avoid obscuring the tarsal bones of the foot.

Center: cuboid-navicular region using a vertical beam

Collimation: from tips of toes to malleoli

#### Oblique

From AP position, the foot is rotated medially to 25° with the medial aspect of the foot is still in contact with the cassette.

Center: cuboid-navicular region using a vertical beam

Collimation: from tips of toes to the heel

### ***For foreign bodies***

#### Lateral

From AP position, the foot is externally rotated 90° until the lateral aspect of the foot is in contact to the cassette.

The knee and ankle are flexed 90°.

Center: navicular-cuneiform joint (halfway between the tip of the big toe and the heel) using a vertical beam

Collimation: from tips of toes to the heel and also the malleoli

### ***For Pes planus (flat feet)***

#### Lateral erect

The patient stands on the couch (pads), with the lateral aspect of the foot is in contact with the horizontally placed cassette.

The other leg is moved backward to avoid overlapping.

Exposed with the patient stands on the foot being radiographed.

Both feet are radiographed for comparison.

Center: the base of the 5<sup>th</sup> metatarsal using horizontal beam

Collimation: from tips of toes to the heel and also the malleoli

***For hallus vagus***

AP erect

Same as AP foot but the patient stands on the cassette on both feet.

***Toes***

AP; oblique

Same positioning as foot.

Center: metatarso-phalangeal joint of the particular toe using a vertical beam

Collimation: from tip of that toe to its corresponding metatarsal bone

***Big toe***

AP

Same positioning as AP foot.

Center: the 1<sup>st</sup> metatarso-phalangeal joint

Collimation: from tip of the toe to 1<sup>st</sup> metatarsal bone

**Lateral**

From AP position, the foot is rotated until the lateral aspect of the big toe is in contact with the cassette.

A wooden strip can be held by the patient to push the big toe out in order to clear from the other toes.

Center: the 1<sup>st</sup> metatarso-phalangeal joint

Collimation: from tip of the toe to 1<sup>st</sup> metatarsal bone

***Ankle***

AP

The patient lies supine on the couch with the legs extended.

The ankle joint is flexed 90° with the lower skin margin of the heel is placed at the bottom edge of the cassette.

The foot is internally rotated until the both malleoli are equidistant.

Center: halfway between the two malleoli using a vertical beam

Collimation: from the heel to the lower third of the lower leg

Lateral

The foot of the patient is rotated laterally until the two malleoli are superimposed.

Center: the medial malleolus using a vertical beam

Collimation: from the heel to the lower third of the lower leg

***For sub-talar joint, talo-calcaneal***

Lateral oblique

From AP ankle position, the foot is laterally rotated 45°.

Center: 2.5cm distal to the medial malleolus using a 15°cranially tube tilting beam

Collimation: from the heel to the lower third of the leg

Medial oblique

From AP ankle position, the foot is medially rotated 45°.

Center: 2.5cm distal to the lateral malleolus using 10°, 20°, 30°, 40° cranially tube tilting

Collimation: from the heel to the lower third of the leg

***Calcaneum***

Lateral

Same positioning as lateral ankle.

Center: 3cm distal to the medial malleolus using a vertical beam

Collimation: from the heel to the malleoli

Axial

Same positioning as AP ankle.

Center: midline in the plantar aspect of the foot at the level of two malleoli with a 40° cranially tube tilting

Collimation: from the heel to the malleoli

***Heel (look for calcaneal spur)***

Lateral

The patient is seated on the couch with the soles of feet are touching each other.  
The knees and ankles are flexed so that the lateral aspects of feet are in lateral.

Center: midway at the level of 5cm anterior to the posterior aspect of the heel using a vertical beam

Collimation: the heels

***Lower leg***

AP

Same positioning as AP ankle.

Center: midpoint of the lower leg using a vertical beam

Collimation: from ankle joint to knee joint

Lateral

From AP position, the body is rotated to the affected side.

The knee and the ankle are flexed 90° so that the lateral aspects of the foot and the knee are in lateral.

Center: midpoint of the lower leg using a vertical beam

Collimation: from ankle joint to knee joint

***Knee***

AP

Same positioning as AP ankle.

The knee should be fully extended.

The leg is rotated until the patella is equidistant between the epicondyles.

Center: 2.5cm distal to the apex of the patella using a vertical beam

Collimation: from lower third of the femur to the upper third of the leg

Lateral

The patient lies on the affected side with the knee flexed slightly.

The other leg is brought forward.

A soft pad is placed under the ankle of the affected side in order to bring the broad plane of the patella perpendicular to the cassette.

Center: 2.5cm distal to the apex of the patella using a vertical beam

Collimation: from lower third of the femur to the upper third of the leg

***For proximal talo-fibular joint***

Lateral oblique

Same positioning as lateral knee.

The patient is rotated laterally further until the head of fibula is in profile.

Center: head of fibula using a vertical beam

Collimation: from lower third of the femur to the upper third of the leg

***For arthritis of knees***

AP erect

Same as AP knee but with the patient standing instead.

***For intercondylar notch***

Tunnel's view

Method A:

The patient lies prone on the couch.

The patient raises himself onto all four (hands and knees).

The affected leg is angled 45° behind the patient.

Center: 2.5cm below the crease in the midline of the knee using a vertical beam

Collimation: from lower third of the femur to the upper third of the leg

Method B:

The patient lies prone on the couch.

The leg is raised 45° and rested on a soft pad.

Center: 2.5cm below the crease in the midline of the knee with 45° caudal tube tilting

Collimation: from lower third of the femur to the upper third of the leg

***Patella***

PA

The patient lies prone with the leg fully extended.

The leg is rotated until the patella is centralised within the femoral condyles.

Center: the middle of the crease of the knee using a vertical beam

Collimation: from lower third of the femur to the upper third of the leg

Lateral

Same as lateral knee.

Skyline's view

The patient is seated on the couch.

The knee is flexed about 40°.

The leg is rotated to centralised the patella over the femur.

The film is held by the patient on the anterior aspect of the thigh.

Center: apex of the patella (this will normally require cranial tube tilting from the horizontal)

Collimation: the patella and the proximal end of the leg

Obliques

The patient lies prone on the couch.

The affected knee is rotated 45° externally and internally in turn.

Center: to the condyle nearer to tube using a vertical beam

Collimation: from lower third of the femur to the upper third of the leg

***Femur***

AP

Same position as AP knee.

Center: midshaft of the femur using a vertical beam

Collimation: from the hip joint to the knee joint

Lateral

The patient is rotated to the affected side with the hip and the knee flexed slightly until the knee is in lateral.

The other limb is abducted to avoid overlapping.

Center: midshaft of the femur using a vertical beam

Collimation: from the hip joint to the knee joint

**Hip**

AP

Same positioning as AP femur.

The leg should be in internal rotation position.

Center: 2.5cm distally along the perpendicular bisector of the line joining the ASIS and the upper border of the symphysis pubis using a vertical beam

Collimation: from ASIS to upper third of femur

Lateral

Same positioning as lateral femur.

Center: 2.5cm distally along the perpendicular bisector of the line joining the ASIS and the upper border of the symphysis pubis using a vertical beam

Collimation: from ASIS to upper third of femur

**Pelvis / Hips**

AP

Same positioning as AP hip.

Center: to the midline at the level midway between the ASIS and upper border of the symphysis pubis using a vertical beam

Collimation: from iliac crest to upper third of femur



Frog's view (lateral)

The patient lies supine on the couch.

The hips and knees are flexed and then rotated laterally to maximum extent with both soles of the feet are keep in close contact.

Center: to the midline at the level midway between the ASIS and upper border of the symphysis pubis using a vertical beam

Collimation: from iliac crest to upper third of femur

***For subluxation of symphysis pubis***

AP erect

Same position as AP pelvis instead the patient is standing.

The arms of the patient is placed over the shoulders.

Two exposures are made on one leg on weight in turn.

Center: the symphysis pubis using horizontal beam

Collimation: from hips to upper third of femur

***Lengthening of lower limbs***

In childhood, abnormality of the long bones of lower limb may lead to a severe handicap due to shortening of a limb. Treatment to prevent disability due to the limbs being of unequal length usually involves surgical lengthening of the shorter limb or occasionally the surgical insertion of staples about the epiphyseal line of femur to limit the growth of the sound limb. It is necessary to record the progress. Three different techniques can be used.

Single exposure from hips to ankles

The patient stands facing the tube and the cassette is placed just behind the lower limbs.

The shortened limb is well supported by a certain thickness of wood.

The legs are slightly rotated to achieve an AP position.

Center: in the midline at the level of knee joints using a horizontal beam at 180cm FFD

Collimation: from hips to ankles

Localised exposure

Exposures are made over hips, knees, and ankles with a lead-scaled ruler projected on films.

CT scanogram