

Department of Radiology
Techniques
The Second Stage



Hand and Finger Positions

Lecture 2

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Basic Projections of Hand

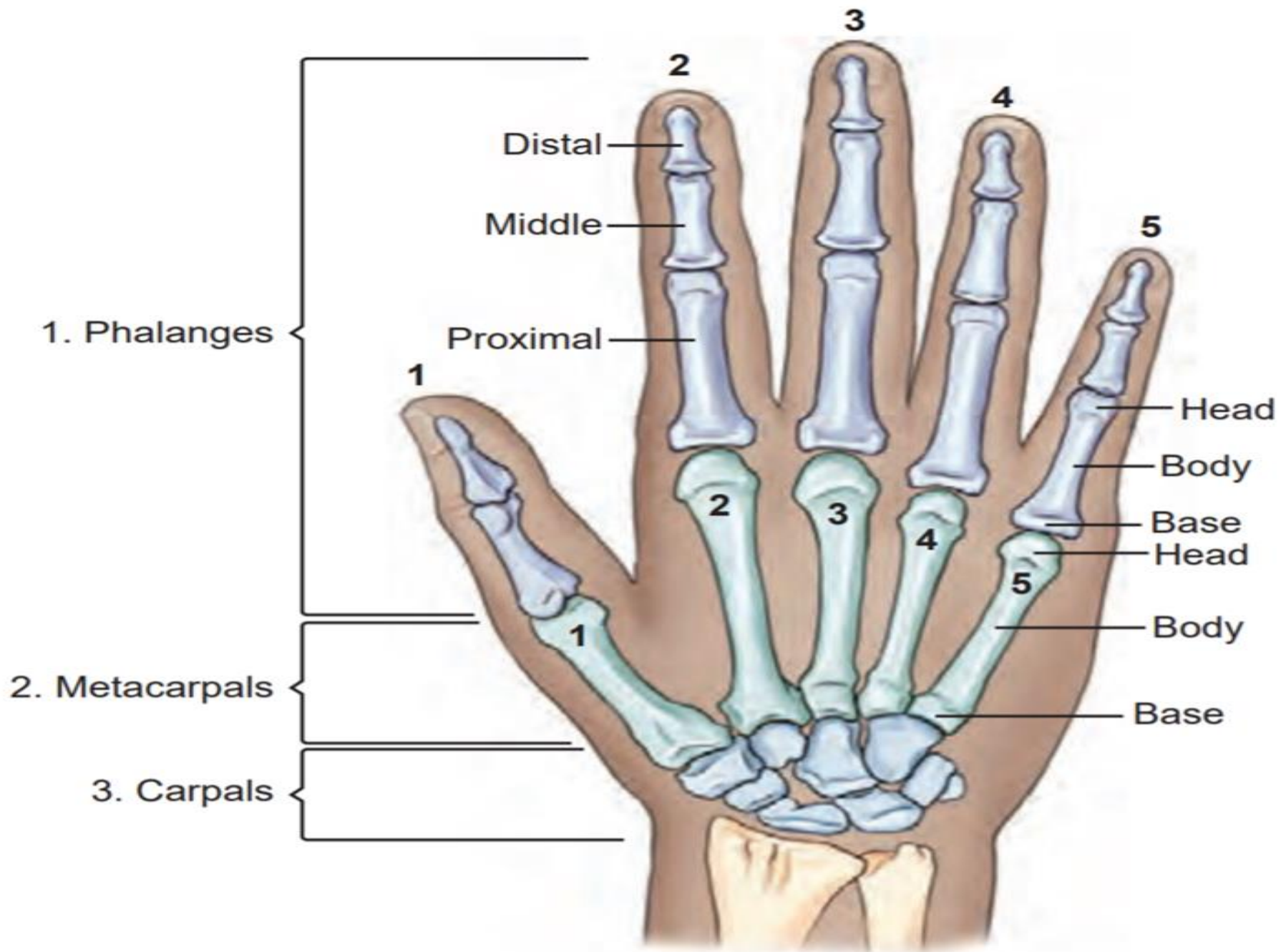
Three Positions

1- Posterior - Anterior (PA)

2- Anterior Oblique

3- Lateral

24 x 30-cm (10x12 inch) cassette size .



1- Posterior-Anterior (PA)

Position of Patient

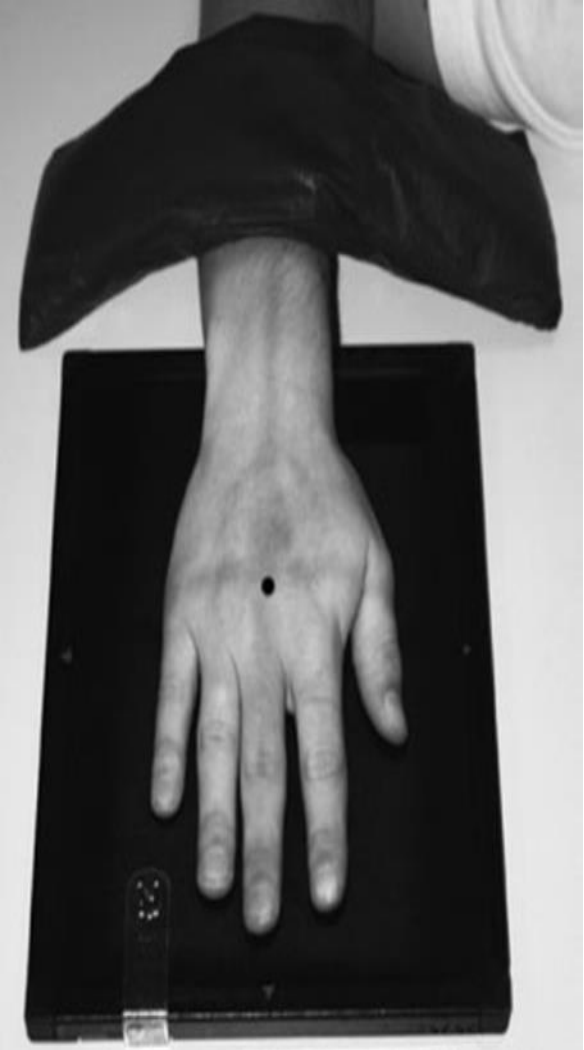
- The patient is seated alongside the table with the affected arm nearest to the table.
- The forearm is pronated and placed on the table with the palmer surface of the hand in contact with the cassette.
- The fingers are separated and extended but relaxed to ensure that they remain in contact with the cassette.
- A sandbag is placed over the lower forearm for immobilization.

Direction and centering of the X-ray beam

- The vertical central ray is centered **over the head of the third metacarpal**.

Essential image characteristics

- The image should demonstrate all the phalanges, including the soft-tissue fingertips, the carpal and metacarpal bones, and the distal end of the radius and ulna.
- The inter-phalangeal and metacarpo-phalangeal and carpometacarpal joints should be demonstrated clearly.
- No rotation.



Normal Postero-Anterior radiograph of left hand



Postero-Anterior radiograph showing fractures of fourth and fifth metacarpals

2- Anterior Oblique

Position of Patient

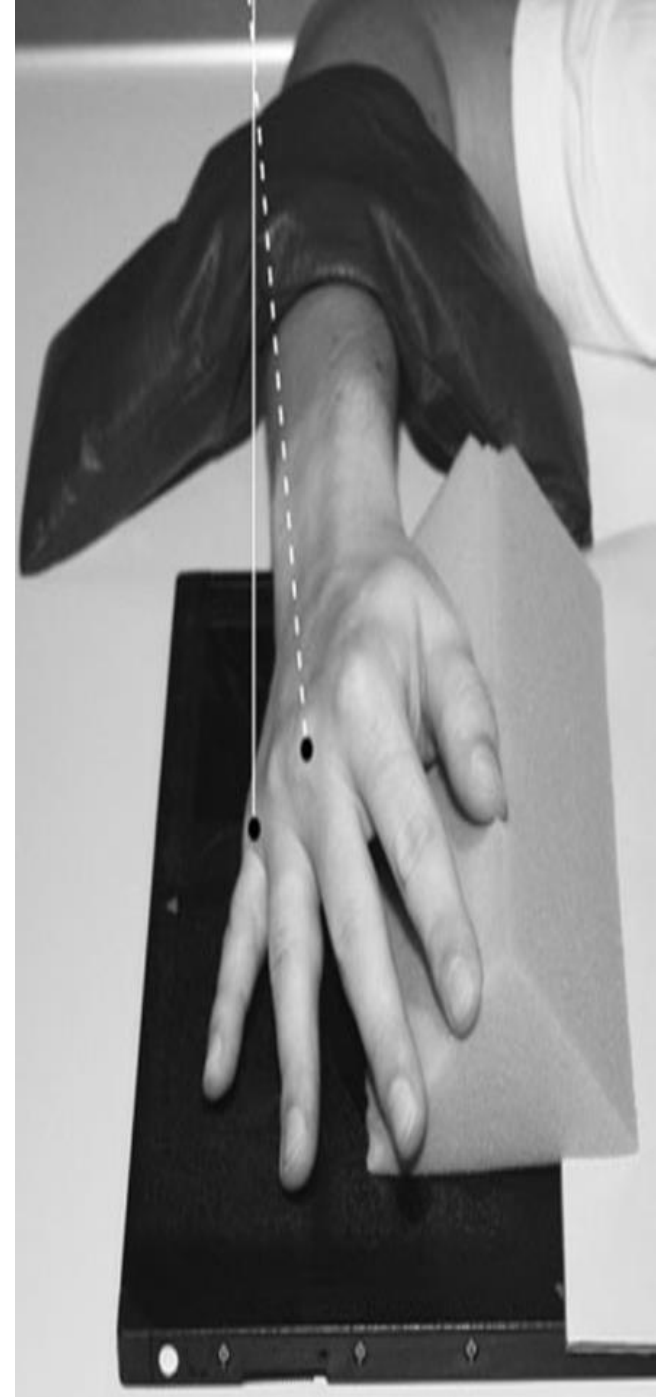
- From the basic postero-anterior position, the hand is externally rotated 45 degrees with the fingers extended.
- The fingers should be separated slightly and the hand supported on a 45-degree non-opaque pad.
- A sandbag is placed over the lower end of the forearm for immobilization.

Direction and Centering of the X-ray beam

- The vertical central ray is centered over the **head of the fifth metacarpal**.
- **The tube is then angled** so that the central ray passes through **the head of the third metacarpal**, enabling a reduction in the size of the field.

Essential Image Characteristics

- The image should demonstrate all the phalanges, including the soft-tissue of the fingertips, the carpal and metacarpal bones, and the distal end of the radius and ulna.
- The correct degree of rotation has been achieved when the heads of the first and second metacarpals are seen separated those of the fourth and fifth are just superimposed.





Normal Anterior Oblique radiograph of left hand

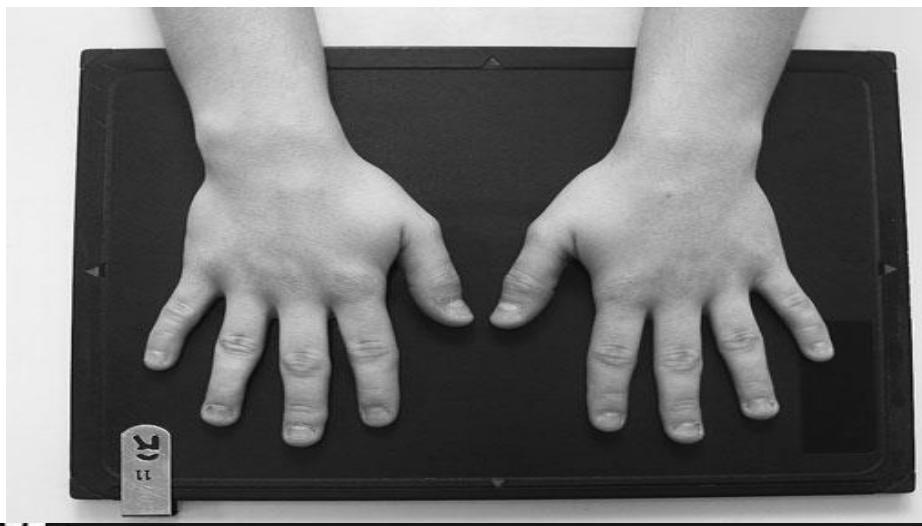
Anterior Oblique radiograph of right hand showing fracture neck of fifth metacarpal (Boxer's fracture)

Posterior-Anterior – Both hands

This projection is often used to demonstrate early rheumatoid arthritis and to monitor the progress of the disease.

Direction and Centering of the X-ray beam

- The vertical central is centered over a point midway between the inter-phalangeal joints of both thumbs.



Normal Postero-Anterior radiograph, both hands



Postero-Anterior radiograph of both hands showing severe erosive disease

**Posterior oblique – Both Hands
(ball catcher’s or Nørgaard projection)**

This projection may be used in the diagnosis of rheumatoid arthritis. It can also be used to demonstrate a fracture of the base of the fifth both hands are rotated internally (medially) 45 degrees into a ‘ball-catching’ position metacarpal

Centering of the X-ray beam

- To a point midway between the hands at the level of the fifth metacarpo-phalangeal joints.



severe erosive disease



Normal

3- Lateral

This Position used to locate a foreign body. It may also be used to demonstrate a fracture or dislocation of the carpal bones

- From the posterior-anterior position, the hand is externally rotated 90 degrees.
- The palm of the hand is perpendicular to the cassette, with the fingers extended and the thumb abducted and supported parallel to the film on a non-opaque pad.
- The radial and ulnar styloid processes are superimposed.

Direction and centering of the X-ray beam

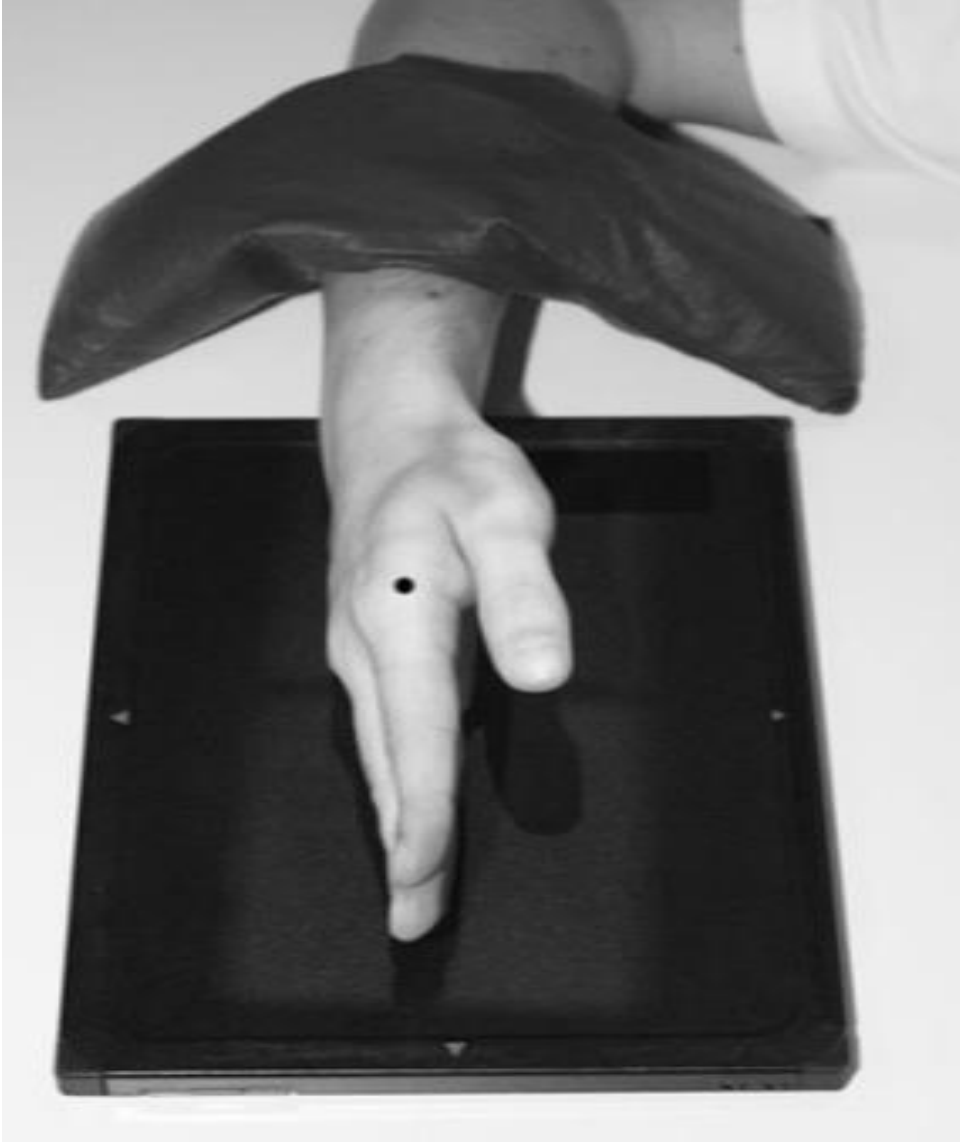
- The vertical central ray is centered over the head of the second metacarpal.

Essential image characteristics

- The image should include the fingertips, including soft tissue, and the radial and ulnar styloid processes.
- The heads of the metacarpals should be superimposed.
- The thumb should be demonstrated clearly without super imposition of other structures.

Notes

- If the projection has been undertaken to identify the position of a foreign body, the kVp should be lowered to demonstrate or exclude its presence in the soft tissues. A metal marker placed adjacent to the puncture site is commonly used to aid localization of the foreign body.



Lateral radiograph of hand with foreign body marker. There is an old fracture of the fifth metacarpal

Fingers Basic projections

It is common practice to obtain two projections, **Posterior-Anterior** and **lateral (10x12 inch) cassette size** .

Posterior-Anterior

Position of patient and cassette

- The patient is positioned seated alongside the table as for a posterior-anterior projection of the hand.
- The forearm is pronated with anterior (palmer) aspect of the finger(s) in contact with cassette.
- The finger(s) are extended and separated.
- A sandbag is placed across the dorsal surface of the wrist for immobilization.

Direction and centering of the X-ray beam

- The vertical central ray is centered over the proximal interphalangeal joint of the affected finger.

Essential image characteristics

- The image should include the fingertip and the distal third of the metacarpal bone.



Postero-anterior radiograph of the index and middle fingers

Lateral – index and middle fingers

Position of patient and cassette

- The patient is seated alongside the table with the arm abducted and medially rotated to bring the lateral aspect of the index finger into contact with the cassette.
- The raised forearm is supported.
- The index finger is fully extended and middle finger slightly flexed to avoid superimposition.
- The middle finger is supported on a non-opaque pad.
- The remaining fingers are fully flexed into the palm of the hand and held there by the thumb.

Direction and centering of the X-ray beam

- The vertical central ray is centered over the proximal interphalangeal joint of the affected finger.

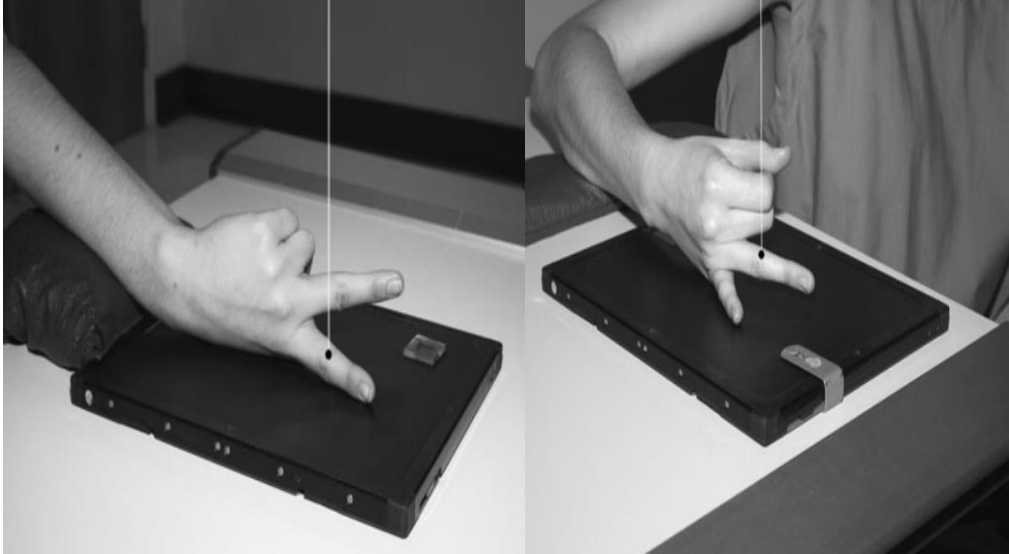
Essential image characteristics

- The image should include the fingertip and the distal third of the metacarpal bone.
- The condyles should be superimposed to avoid obscuring a volar plate fracture

R



Normal lateral radiograph of ring and little fingers



L



Lateral radiograph of middle finger showing a fracture of the middle phalanx

R



Lateral radiograph of little finger showing dislocation of the distal interphalangeal joint

R



Lateral radiograph of index and middle fingers

Thanks

