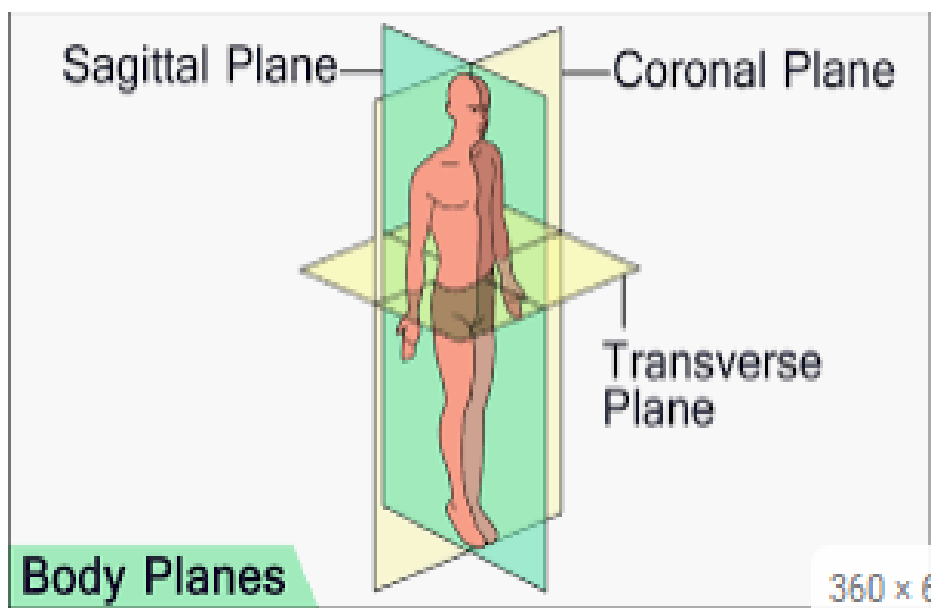


## Terminology

**Sagittal plane** : divides the body into Rt and Lt halves

**Axial (transverse)** divides the body into superior and inferior

**Coronal plane** :divided the body into anterior and posterior



**Body position**: the way the body is placed

Erect, supine, prone, lateral .....

**Aspect** : the way viewing the body

Anterior ( from front ), posterior ( from back ), lateral (from side)...

**Projection** : the direction of the central ray relative to aspects and planes of the body ex. Anteroposterior proj. , lat.proj.,.....

# Image quality

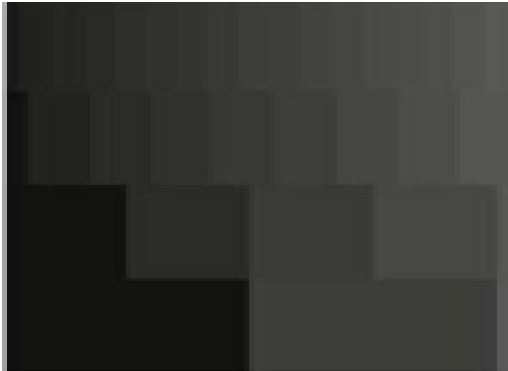
## 1. Exposure factor

The **kilo voltage (KV)** (higher kv = low contrast = wide latitude , while lower kv = high contrast = narrow latitude )

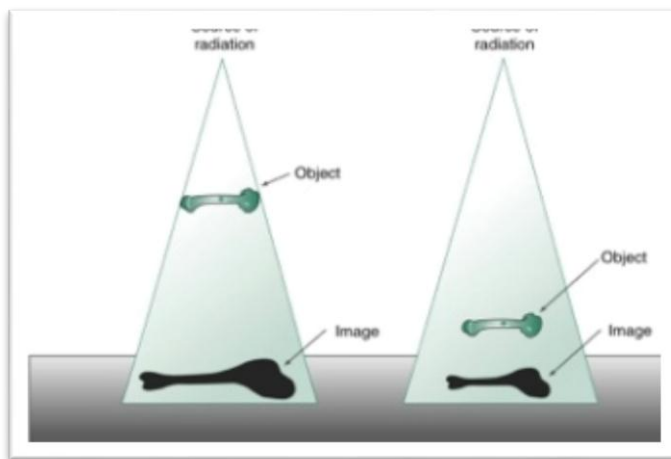
**MAs** (mill ampere per second)

The **FFD** (focus to film distance) mostly 100 cm

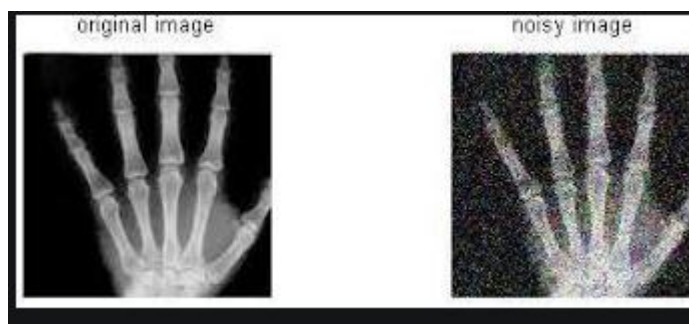
## 2. contrast resolution : (visibility of details )



## 3. Distortion : variation in size or shape of the object



## 4. Noise: fog



# Upper limb

## Hand PA and lat..

Structure shown : carpals' metacarpals and phalanges (distal radius and ulna should be visible )

\* 8\*10 inch /non grid.:

\* Kv range :analog=50\_55 kv                      digital=55\_60kv

**PA position** Pt seated, hand on table, long axis of hand parallel to edge of IR

\*Central ray (CR) to 3<sup>rd</sup> MCP joint

**LAT** .:pt seated , hand on table in lateral position thumb side up

\*Central ray :to 2<sup>nd</sup> MCP joint

\*Kv range :analog=60\_65 kv                      digital=65\_70 kv

## Wrist PA and lat.

\*8\*10 inch/non grid

**AP** :Position pt seated , arm on table , hand and wrist parallel to edge of IR, lower shoulder rest arm on table to insure no rotation of wrist

\*Central ray (CR) centered to midcarpals

\*KVrange :analog=60\_65 kv                      digital=65\_70kv (for both views)

**Lat.:** pt seated , arm on table elbow flexed sholder dropped to place humerus ,forearm and wrist on same horizontal plane ,hand and wrist parellale to IR,place hand and wrist in true lateral position

\*CR=centered to midcarpales

**Scaphoid views** : **PA(AP)with ulner deviation – modified stecher (scaphoid)**

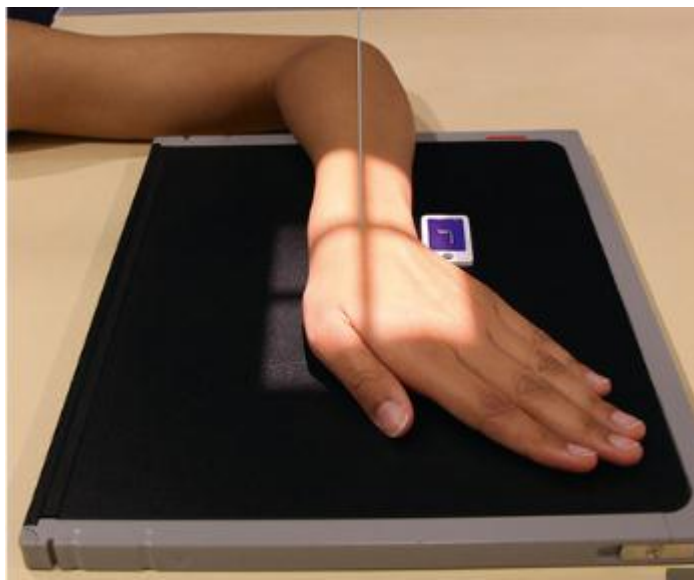
**If pt cannot ulner deviate wrist ,elevate hand on 20 degree angle sponge**

\*8\*10 inch /non grid

**Position from PA position gently elevate wrist toward ulnar side as far as pt can tolerate**

**Note:** four projection series with CR at 0 ,10,20,and 30 degree may required

\* Kv range :analog =60\_65 kv                      digital=65\_70kv



PA with ulnar deviation

)

## Forearm

### AP

\* 14\*17 inch or 11\*14 (for smaller PT)/non grid

Position :pt seat at end of table with arm extended and supinated , ensure that post wrist and elbow J. are included (use as large an IR asrequired to iclude both )

Pt lean laterally as needed for atrue AP of forearm

CR:centered to midpoint of forearm

\* Kv range : analog=60\_70 kv                      digital=70\_75 kv

Fractures radius : distal fracture with dislocation (**collies and reversed collies**)

Fracture proximal radius with ulnar dislocation (**Galeazzi fracture**)

Fracture ulna shaft with radial dislocation (**monteggia fracture**)

## Elbow joint : **(AP, LAT(the elbow flexed 90 degree ). Oblique view**

**Shown structures** :proximal forearm ,distal 3<sup>rd</sup> humerus , elbow j. , and soft tissue of elbow

\* 10\*12 inch

\*Kv range : analog=70\_75 kv                      digital=75\_80 kv\*.

**AP: position** :pt. seat alongside with affected side near the table , the posterior aspect of the humerus is placed on the

table with palm of hand facing upward the forearm on the cassette with elbow j at its center , the medial and lateral epicondyle of humerus must be equidistant from the film , the limb is supported and immobilized at this position

*\*CR: centered midway between epicondyle of the humerus*

**Lat. position:** Patient seated alongside of table with affected side nearest the table ,flexed elbow 90 degree, and the palm is at 90 degree on the table the humerus and elbow joint at same plane , half of the cassette is under the elbow j

*\*R: centered over lateral epicondyle of humerus*

## **Humerus bone: (AP ,LAT.)**

**AP position :**the pt sit or stand with back and posterior aspect of upper arm incontact with IR

CR: the horizontal central ray is directed at right angle to the shaft of humerus and centered midway between the shoulder and the elbow

**Lat position :** usually taken in standing position ,( it also can take in supine position ) pt stand facing the IR( which placed on erect holder ) with an affected side close to the IR , then rotate , the lateral aspect of an injured arm is on contact with IR , the arm internally rotated and abducted and the elbow flexed 90 degree

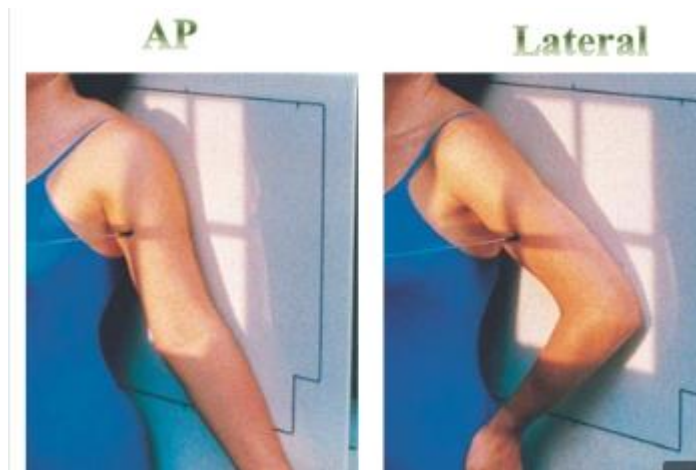
Fracture of proximal part

Fracture shaft

*\* 8\*10 inch /grid*

*\*Kv range : analog=75\_80 kv*

*digital=80\_85 kv*



### Shoulder joint:

**AP (glenohumeral ):** the pt stand the affected shoulder against the IR, and rotated 30 degree, the arm supinated and abducted , the upper border of IR is at least 5cm above the shoulder .

8\*10 inch /grid

\*Kv range : analog=75\_80 kv      digital=80\_85 kv

\*CR : the horizontal ray is centered to the palpable corocoid process of the scapula , the primary beam is collimated to include the head of humerus , with the lateral aspect of scapula , and the distal end of clavicle .



**LAT oblique:** the patient stand or sit with lateral aspect of injured arm against IR and and adjusted so the the axilla is in the center , the unaffected shoulder is raised to make angle between the trunk and IR is ,60 degree , aline joining the medial and latreral borders of the scapula is at

*RT angle to the IR, superior border of scapular should be included .*

*\*CR : the horizontal ray is directed towards the medial border of scapula and centered to the head of humerus*



***SUPEROINFERIOR (axial)***: patient seat at side of table wich is lowered to waist level ,the arm abducted,over the IR and , the pt lean forward to reduce to ensure glenoid cavity included in the image .the elbow can remain flexed

*\*CR: the vertical central ray is directed through the proximal aspect of humeral head , with some tube angulation towards the palm of the hand*

*\* Kv range : analog=75\_80 kv                      digital=80\_85 kv*

*\* 8\*10 inch or 10\*12 inch /grid*

