X-Ray Interpretation

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How to Read an X-Ray

- Example:
  - This is a series of 3 weightbearing images of the ankle marked right in a skeletally mature patient. Included are AP, mortise and lateral views. On the AP view, I see evidence of a Weber B distal fibula fracture, which is displaced.
How do I know if it’s weightbearing?

- Obvious
- Less obvious (think of the small dots as where the floor is)

How do I know if it’s skeletally immature?

- Open growth plates

On any x-ray

- Comment on joint space
- Normal or narrowed

On any x-ray

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- Comment on alignment
- Normal, varus or valgus
On any x-ray
- Comment on joint space
  - Normal or narrowed
- Comment on alignment
  - Normal, varus or valgus
- Comment on any fractures or dislocations

Imaging - Shoulder
Views of the shoulder
- AP (standard vs. Grashey)
- Scapular outlet view
- Axillary

Upper Extremity Imaging
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**AP (in the plane of the scapula)**

- X-Ray plate
- X-Ray beam

**SOV (scapular outlet view or scap Y view)**

- X-Ray plate
- X-Ray beam

**Axillary**

- Coracoid is anterior
- X-Ray plate
- X-Ray beam

**Imaging - Elbow**

Views of the elbow
- AP
- Oblique
- Lateral
**Imaging - Wrist**

Views of the wrist
- PA (back to front)
- Oblique
- Lateral
- Scaphoid

**Views of the wrist**

- PA (back to front)
- Oblique
- Lateral
- Scaphoid
Lower Extremity Imaging

Views of the pelvis
- AP view
- Inlet view
- Outlet view

Radiographs
- Anteroposterior (AP)
- Inlet (40° caudal)
- Outlet (40° cephalad)
- CT scan
- Judet (acetabular fractures)

Imaging - Pelvis

Inlet View

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**Inlet (Caudad) View**
- Horizontal Plane Rotation
- Posterior Displacement
- Sacral ala

**Outlet View**

**Outlet (Cephalad) View**
- Sacrum
- Cephalad Displacement
- Sacral Foramina

**Imaging - Acetabulum**
Views of the acetabulum
- AP pelvis
- Judet views
  - Internal (obturator) oblique
  - External (iliac) oblique
1. Iliopectineal line (anterior column)
2. Ilioschial line (posterior column)
3. Teardrop
4. Sourcil (acetabular roof)
5. Anterior rim of acetabulum (anterior wall/column)
6. Posterior rim (posterior wall/column)

**Judet Oblique Radiographs**

**Internal (Obturator) Oblique**
- Injured side up 45 degrees
- Obturator foramen visualized fully
- Visualization of
  - Anterior column
  - Posterior wall

**External (Iliac) Oblique**
- Injured side down 45 degrees
- Iliac wing visualized fully
- Visualization of
  - Posterior column
  - Anterior wall

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**Obturator Oblique**

**Iliac Oblique**

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**Imaging - Hip**

Views of the hip
- AP
- Frog lateral
- Cross table lateral
- Better in non-trauma setting
- Better for trauma

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**AP**

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**Frog Lateral**

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**Cross Table Lateral**

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Views of the knee
- Prefer weight bearing
- AP (front to back)
- Lateral (side)
- Rosenberg
- Sunrise view

Rosenberg view = weightbearing surface of the knee

Rosenberg (notch view)
Views of the ankle
- Prefer weight bearing (if not traumatic)
- AP (front to back)
- Mortise (oblique)
- Lateral

Views of the foot
-prefer weight bearing (if not traumatic)
- AP (front to back)
- Oblique
- Lateral
Examples of Pathology

Osteoarthritis
4 key findings on x-rays (any joint):
- 1. Subchondral sclerosis
- Area of whiter area right under the cartilage surface
Osteoarthritis
4 key findings on x-rays (any joint):
1. Subchondral sclerosis
2. Joint space narrowing
3. Osteophyte formation
4. Cysts

Fractures
1. Displaced or not displaced
2. Intra- or Extra-articular
3. Morphology
   - Transverse
   - Vertical
   - Oblique
   - Spiral
   - Avulsion
   - Butterfly
   - Comminuted

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Dislocations
- Describe by the direction of the distal fragment
  ANTERIOR shoulder dislocation
  LATERAL midfoot dislocation

Let's practice!
Read these X-Rays

Case 1

Case 2