Fractures

Normal Bone and Normal Ossification
Bone Terms

- Epiphysis
- Epiphyseal Plate (physis)
- Metaphysis
- Diaphysis
## Fracture Classifications

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<td>Longitudinal</td>
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<td>Transverse</td>
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<tr>
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<td>Oblique</td>
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<td>D</td>
<td>Spiral</td>
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<td>E</td>
<td>Incomplete</td>
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<tr>
<td>F</td>
<td>“T” fracture</td>
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<tr>
<td>G</td>
<td>Impacted, compressed</td>
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<tr>
<td>H</td>
<td>Comminuted</td>
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<td>I</td>
<td>Pathological</td>
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<td>J</td>
<td>Closed fracture</td>
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<tr>
<td>K</td>
<td>Open fracture</td>
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<tr>
<td>L</td>
<td>Avulsion fracture</td>
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### Diagram of Fracture Classifications

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Fracture Position

Distal Relationship to Proximal

- Displacement
- Angulation
- Shortening
- Rotation
- Dislocation (complete loss of continuity at a joint)
- Subluxation (partial loss of continuity at a joint)
- Fracture-dislocation (same bone with a fracture and a dislocation)

Fracture Evaluation

- X-ray films should be taken in at least 2 projections usually AP and lateral view
- X-ray films should be large enough to include one end of joint and adjacent soft tissue
Fracture Evaluation

- In a child, the healthy opposite side occasionally is examined for comparison
- For special questions, some special studies
  - Oblique view
  - Stress film
  - Flexion and extension views
  - Delayed films

Lower Leg Fracture

- Frontal view
- Oblique fracture tibia
- Angulation convex lateral at fracture
- Slight medial displacement distal fragment
- Comminuted fracture of fibula
- Lateral displacement
- Angulation convex lateral at fracture
Lower Leg Fracture
Lateral View

- Posterior displacement of tibia fracture
- Slight angulation convex anteriorly at the fracture site
- Inadequate films with fibular fracture not included

Forearm Fracture

- No angulation
- Transverse slightly impacted fracture radius
- Associated ulnar fracture evident
**T Type Fracture**

- Vertical component somewhat lucent
- Horizontal component slight impaction with increased density

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**Impaction Fracture Radius**
Tibia Fracture

- Oblique, almost spiral fracture line
- Barely visible on the frontal study

Comminuted Fracture

- Comminuted fracture of distal radius
- Anterior angulation
- Extension into the joint space
Scaphoid Fracture

- Undisplaced fracture
- Only lucent line identified

Scaphoid Fracture Old
Scaphoid Fracture

- Sclerosis of proximal portion
- Avascular necrosis of the proximal portion *
- Blood supply distal to proximal

Radial Head Fracture

- Small joint effusion with small anterior and posterior fat pads
- Minimally depressed radial head fracture
Pathologic Scaphoid Fracture

- Small cystic zone in scaphoid
- Fracture through the cyst

Salter I Fracture

- Posteriolateral displacement of epiphysis
Humerus Fracture

- Shoulder trauma
- Surgical neck involvement
- Somewhat comminuted

Olecranon Fracture

- Joint effusion, anterior and posterior fat pads
- Displaced fracture of the olecranon
Monteggia’s Fracture

- Ulnar fracture
- Radial dislocation
- Paired bones – almost always both involved

Tibial Stress Fracture

- Femur, tibia, metatarsals common locations
- Bone scan and MRI useful
- Plain film negative many cases
- Linear fracture with some callus in this case
Healing Stress Fracture

- Periosteal reaction
- Resorption along the fracture line
- Early healing

Distal Femoral Stress Fracture

- Stress fracture distal posterior cortex
- Periosteal elevation restricted to area of injury
Femoral neck fracture
(traumatic s/p fall)

- Recent fall
- Disruption of femoral neck

Hip Dislocation – Acetabular Fracture
Posterior Hip Dislocation

Tibial Plateau Fracture

- Transverse tibial plateau fracture through growth plate
- Edema medial femoral condyle, tibial plateau
C-3 Fracture/ dislocation

- C2 Fracture
- Anterior subluxation
- "hangman’s” fracture

C-2 Fracture
Post Op – Halo placement

- C2 Fracture – minimal displacement
- Post-Op placement of a halo device

Cervical Dislocation C4-5

- Anterior dislocation C4-5
- Facet joint dislocation