Anulus fibrosus

Nucleus pulposus

Superior view

Normal intervertebral disc

Bulging disc

T12

L1

L2

Compressed area of spinal nerve

Nucleus pulposus of herniated disc

Spinal nerve

Spinal cord

Anulus fibrosus

(a) Kyphosis

(b) Lordosis

(c) Scoliosis

Clinical scan of a compression fracture in a lumbar vertebra
Compression Fracture
Age and Dietary Related Changes to Bone

(a) Normal spongy bone (SEM x 25)
(b) Spongy bone in osteoporosis (SEM x 21)

The legs of an individual with rickets
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Osgood-Schlatter Disease
Sever’s Disease

Little League Elbow

Avulsion Fracture

Shoulder Injury

- Shoulder Dislocation
- Damage to the glenohumeral (GH) joint
- Considered a *shoulder joint* injury
- Often caused by a downward blow onto an arm that is abducted and externally rotated
Shoulder Injury

- Shoulder Separation
  - Damage to the acromioclavicular (AC) joint
  - Considered a shoulder girdle injury
  - Often caused by falling on an outstretched arm, forcing head of humerus upwards into the AC joint
  - AC joint may be noticeably deformed

Broken Wrist

- Fractured distal radius
  - Also called a Colles' fracture
  - Extremely common
  - Mechanism of injury is falling on an outstretched arm

Avascular Necrosis

Knee Joint Structures

- Ligaments
  - Medial collateral
  - Lateral collateral
  - Anterior cruciate
  - Posterior cruciate
- Cartilages
  - Medial meniscus
  - Lateral meniscus
Knee Injury

- Unhappy Triad
  - Blow to the lateral aspect of knee with foot planted
  - Medial knee joint “separates”
- Damaged structures:
  - Medial collateral ligament
  - Medial meniscus
  - Anterior cruciate ligament

Knee Joint Injury

- Q Angle
  - Quadriceps femoris line of pull runs from ASIS to center of patella
  - Patellar ligament line of pull runs from center of patella to tibial tuberosity
  - Q Angle is formed at the intersection of these two lines
  - Greater Q Angles increase knee injury risk and poor patella tracking
  - Generally, females have greater Q Angles

Sprained Ankle

- Forced inversion damages ligaments on lateral ankle

Broken Ankle

- Forced eversion forces tarsals against fibula, breaking the bone above the lateral malleolus.
Sprained Ankle vs Broken Ankle

- Forced eversion pushes tarsals against fibula
- Results in broken fibula
- May also damage deltoid ligament on medial ankle