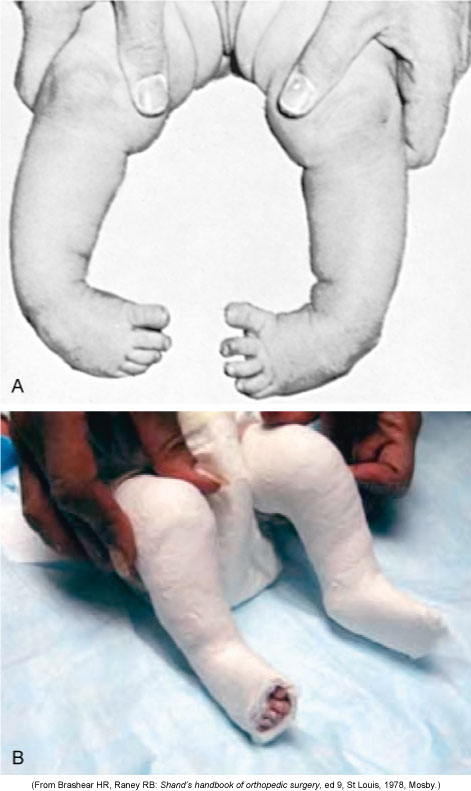
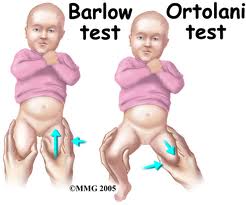
**Pediatric Orthopedic Pathology**

**Dr. Gary Mumaugh – UNW St. Paul**

**Congenital Defects - Clubfoot (congenital equinovarus)**

* Forefoot is adducted and supinated
  + Positional equinovarus
  + Idiopathic congenital equinovarus
  + Teratologic equinovarus

**Congenital Defects - Developmental Dysplasia of the Hip (DDH)**

* Abnormality of the hip that can affect the femoral head, acetabulum, or both
  + Risk factors:
    - Female sex
    - Positive family history
    - Breech presentation
  + The hip can present as subluxated, dislocated, or acetabular dysplasia
  + Manifestations:
    - Asymmetry of skinfolds at groin crease
    - Galeazzi sign
    - Limitation of hip abduction
    - Positive Ortolani sign
    - Positive Barlow test
  + Clinical management
    - Outcome becomes poorer with age
    - Pavlik harness
    - Closed reduction with spica casting
    - Surgery

**Osteogenesis Imperfecta - “Brittle bone disease”**

* ****Defect in type I collagen production
  + Bone and vessel collagen
* Clinical manifestations:
  + Osteopenia
  + Increased rate of fractures
  + Bone deformity (bowing)
  + Short stature
  + Blue sclera and poor dentition
  + Aortic aneurysm
* Clinical management:
  + Surgical
    - Intramedullary and telescoping rod placement
  + Medical
    - Increased calcium and vitamin D
    - Biphosphates

**Osteomyelitis**

* Bone infection from bacteria or tuberculosis (granulomatous)
* ****Acute hematogenous osteomyelitis in children frequently begins as a blood abscess in the metaphysis of the bone
* The abscess ruptures under the periosteum and spreads along the bone shaft or into the bone marrow
* Clinical manifestations:
  + Pain, swelling, warmth, fever
  + Elevated white blood cells, C-reactive protein, and erythrocyte sedimentation rate
* Clinical management:
  + Antibiotics for 6-week regimen
  + Surgical debridement

**Septic Arthritis**

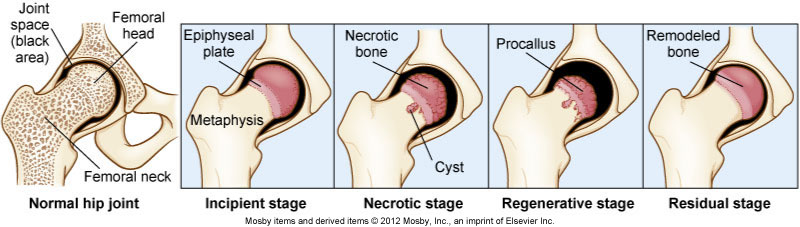
* Caused by bacteria or granulomatous
* Surgical emergency
* Occurs primarily or secondary to osteomyelitis
* Lysosomes destroy articular cartilage and interrupt blood supply
* Clinical manifestations:
  + Pseudoparalysis
  + Inability to bear weight
  + Guarded motion of the joint
  + Malaise
  + Anorexia
* Clinical management:
  + *Staphylococcus aureus* most common bacteria
  + Surgical debridement
  + Antibiotic therapy
  + Long-term follow-up

**Juvenile Rheumatoid Arthritis (JRA)**

* ****Childhood form of rheumatoid arthritis
* The basic pathophysiology of JRA is the same as the adult form
* Three distinct modes of onset:
  + Oligoarthritis
  + Polyarthritis
  + Stills disease
* Differences in JRA and adult RA:
  + Large joints are affected
  + Chronic uveitis
  + Low detection of rheumatoid factor
  + Subluxation and ankylosis of the cervical spine
* Treatment
  + Supportive with anti-inflammatories and methotrexate

**Osteochondrosis**

* Avascular diseases of the bone
* Decrease blood supply
  + Trauma
  + Change in clotting sensitivity
  + Vascular injury
* Legg-Calvé-Perthes disease
  + Interrupted blood supply to the femoral head
  + Deformation due to ischemia is permanent
  + Clinical manifestations:
    - Spasm on rotation of hip
    - Limited internal rotation or abduction of hip
    - Trendelenburg gait
  + Clinical management:
    - Anti-inflammatories
    - Serial radiographs
    - Surgery



**Osgood-Schlatter Disease**

* Tendinitis of the anterior patellar tendon and osteochondrosis of the tubercle of the tibia
* One of the most common ailments in children involved in sports
* Clinical manifestations:
  + Pain
  + Swelling
* Clinical management:
  + Restricted activity
  + Bracing and knee immobilizer



**Scoliosis**

* Scoliosis is a curvature of the spine that involves both lateral curvature and rotation
  + Idiopathic (80% of cases)
  + Congenital
  + Teratogen
* Medical management:
  + Bracing
  + Surgery

**Muscular Dystrophies**

* Group of inherited disorders that cause degeneration of skeletal muscle fibers
* The muscular dystrophies cause progressive, symmetric weakness and wasting of skeletal muscle groups

**Duchenne Muscular Dystrophy**

* Most common of the muscular dystrophies
* X-linked recessive inheritance
  + Deletion of a segment of DNA or a single gene defect on the short arm of the X-chromosome
* Generally affects boys
* Duchenne muscular dystrophy gene
  + Encodes for the dystrophin protein
  + Dystrophin maintains the structural integrity of the cytoskeleton
* Manifestations of the disorder begin to appear by approximately 3 years of age:
  + Slow motor development
  + Progressive weakness
  + Muscle wasting
  + Sitting and standing are delayed
  + The child is clumsy, falls frequently, and has difficulty climbing stairs

**Musculoskeletal Tumors**

* Benign bone tumors
* Osteochondroma
  + Inherited syndrome of hereditary multiple exostoses
* Nonossifying fibroma
  + Sharply demarcated, cortically based lesions of fibrocytes
* Musculoskeletal Tumors

**Malignant bone tumors**

* Osteosarcoma
  + Most common tumor in childhood
  + Originates in mesenchymal cells - Linked to deletion of genetic material
  + Bulky tumor extending into soft tissue
  + Clinical manifestations:
    - Night pain, swelling, warmth,
    - Cough, dyspnea, and chest pain if lung metastasis
  + Clinical management:
    - Graded according to malignancy
    - Surgery and chemotherapy
* Ewing sarcoma
  + Most lethal bone tumor
  + Translocation of chromosome
  + Breaks through bone to form soft tissue mass
  + Metastasizes to nearly every organ
  + Clinical manifestations:
    - Pain that increases in severity
    - Fever, Malaise, Anorexia
  + Clinical management:
    - Radiation and chemotherapy
    - Surgical debridement

**Nonaccidental Trauma**

* “Corner” metaphyseal fractures
  + Long bone fractures caused by a twisting force
  + Transverse tibial fractures are the most common
  + Associated with child abuse, but osteogenesis imperfecta must be ruled out
* Legally mandated to report child abuse