Common Orthopedic Problems of Children

- Congenital
- Acquired
- Bones
- Neuromuscular

General Nursing Considerations for any musculoskeletal condition

- Prevent neurovascular injury
- Prevent/monitor for infection
- Prevent injury r/t falls, etc
- Comfort
- Manage nutrition
- Anxiety
- Knowledge deficit (child & parent) re: disease process and treatment
- Manage effects of immobilization

Effects of Immobilization

PHYSICAL effects on muscular system
- Significant loss of muscle strength, endurance, and muscle mass
- Bone demineralization
- Loss of joint mobility; contractures
Physical effects on other systems

- Pulmonary
- Cardiac
- Skin integrity
- Elimination
  - GI
  - GU

Effects of Immobilization

EMOTIONAL
- Removes outlet for expressing anxiety
- Decreases environmental stimuli
  - Risk for delayed development
- Provide appropriate diversional activities

Anatomy
- Ossification
- Diaphysis
- Epiphysis
- Epiphyseal plate
- Periosteum
Bone characteristics in children

- Long bones porous
- Thicker periosteum: more rapid healing
- Remodeling

Pediatric Fractures

- r/t trauma or bone disease
  - w/trauma, always look for other injuries.
- Complications:
  - Emboli
  - Hemorrhage
  - Fat emboli
  - Infection

Fractures: Infants

- Rare
- Birth trauma
- Child abuse
- Osteogenesis imperfecta
Fractures:

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<th>Younger Children</th>
<th>School Age</th>
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<td>Clavicle</td>
<td>Bike – auto</td>
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<td>Hip fractures</td>
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Pediatric Fractures

- “Simple” fx: no break in skin
- Children’s bones are more flexible – can bend or buckle.
- Greenstick: break occurs through the periosteum on one side of the bone while only bowing or buckling on the other side. Seen most frequently in forearm.

Physeal Growth Plate Fracture: Salter-Harris Classification

- Type I: Growth plate is partially disrupted, with minimal displacement.
- Type II: Growth plate is completely disrupted, with minimal displacement.
- Type III: Growth plate is partially disrupted, with significant displacement.
- Type IV: Growth plate is completely disrupted, with significant displacement.
Common Treatments

- Immobilization
  - Cast
  - Traction
  - Bedrest
  - Brace
- Surgery

Care of child in a cast

- CMS
- No small toys
- No baby powder
- Developmental teaching, play

The Five P’s of Vascular Impairment

- Pain
- Pallor
- Pulselessness
- Paresthesia
- Paralysis
Compartment Syndrome

- Muscles & nerves enclosed in a compartment of inelastic fascia.
- Swelling compromises circulation.
- Result: necrosis of tissue
- Sx: worsening pain – rest of 5 P’s
- Tx: bivalve the cast; fasciotomy
- Prevention
  - Early Detection: CMS checks
  - A Medical Emergency !!!

Traction:

**Purpose**
- Fatigue the involved muscle (reduce spasm)
- Realign bone pieces
- Immobilize fracture site until casting can be done

**Guidelines for care**
- Understand therapy
- Maintain traction
- Maintain alignment
- Proper care: skin, skeletal
- Prevent complications

Developmental Dysplasia of Hip

- Definition: the head of the femur is improperly seated in the acetabulum of the pelvis.
- Congenital or developmental
- Varying in degree
Treatment Goals

• Prevent:
  – Weakness of hip muscles
  – Stiffness, ↓ ROM
  – Arthritis

DDH

• Routine infant screening
  – Asymmetry of gluteal skin folds
  – Limited ROM
  – Asymmetric abduction
  – Positive Allis’ sign
  – Ortolani- Barlow maneuvers

Therapeutic management DDH: newborn to 6 months

• Pavlik Harness
  – Maintain flexion, abduction, external rotation
    • Worn continuously 23 hrs/day (usually 3-6 mo).
  – Skin integrity
  – Lower extremity tissue perfusion
Parental Teaching

1. Neurovascular (CMS checks)
2. Requires modification in car seat, feeding, holding in general
3. Skin integrity – diaper over harness, but t-shirt under harness
4. Remember developmental task of infant – needs stimulation: talking, singing, things at eye level, encourage upper extremity movement.

Therapeutic management: DDH: 6-18 mo

• Traction followed by cast immobilization
• Open reductions
  – post-op spica cast

• Braces

Therapeutic management DDH:
Older child

• Tx more difficult; operative reduction
• Successful reduction
  – very difficult >4 yrs old
Other Musculoskeletal Alterations Involving Hip

- Legg-Calve-Perthes Disease
  - 4-8 yr old
- Slipped capital femoral epiphysis
  - adolescents

Osteomyelitis

- Infection of bone
- Antibiotics
- Surgery
- Immobilization
  - Bedrest
  - Splint, Cast
- I & D

Bone Cancers: Osteosarcoma

- Osteogenic sarcoma
- Usually presents in adolescent boys.
- Often metastasize when discovered
- CM’s: progressive pain @ tumor site, palpable mass; limping (if leg involved); fracture
Treatment: Osteosarcoma

- Surgery
- Chemotherapy
- Amputation (less now)
- Radiation therapy (palliative)

Ewing’s Sarcoma

- Tumor arises in nerve tissue; bone marrow & soft tissue
- Metastasize approx 1/3
- Sx: pain, swelling, fractures
- Tx: same as osteo
  - More responsive to radiation.

Spinal Abnormalities
Scoliosis

- Def: curvature of spine 10 degrees or more on x-ray
- Causes:
  - congenital
  - neuromuscular disease
  - idiopathic

Treatment
- Watchful waiting
- Bracing
- Surgery

Post op Spinal surgery

- ROM
- Log Roll
- C&DB
- NPO/NG tube
- Neurovascular checks (CSM)
- Monitor Hct
- Pain

Muscular Dystrophy

- Group of muscular diseases - 5 types
- Similarities
  - Genetic component
  - Progressive, degenerative
  - weakness, atrophy, & deformity
- DIFFER:
  - Age
  - Which muscle groups affected
Duchenne (pseudohypertrophic)

- Most common type
- Meet motor developmental milestones
- Manifests after walking (age 3-7)
  - Waddling gait, difficulty climbing stairs, riding bike, running
- More progression: Gower’s sign
- Wheelchair by age 9-12
- Death by age 20 in 75%

Outcomes

- Maintain function @ optimal level
  - PT
  - Even when ill: get OOB

Outcomes

- Maintain Skin integrity
- Prevent obesity (pt. will maintain weight w/in [parameters])
- Respiratory support (pt. will maintain O2 sat > ___)
- Emotional support family & patient
- Financial support