Musculoskeletal System Outline – Child

I. Osteogenesis Imperfecta

A. Definition- Rare inherited genetic disorder in which bones fracture easily
B. Pathophysiology
   1. Abnormal precollagen which prevents formation of collagen
   2. Faulty bone mineralization, abnormal bone architecture, fractures
   3. Several Main types
C. Clinical Manifestations
   1. Bone fragility and fractures
   2. Hearing loss, blue tinted sclera, dental issues
D. Diagnosis
   1. History & Physical
   2. X-ray
   3. Gene testing
E. Therapeutic Management
   1. Braces and splints
   2. Physical therapy & simple exercises
   3. Surgery prn for fractures that need stabilization
   4. bisphosphonate with IV pamidronate
F. Nursing Considerations
   1. Careful handling, support when moving, turning, positioning
   2. Child abuse accusations are possible until diagnosis & proof of diagnosis
   3. Genetic counseling

II. Legg-Calve – Perthes Disease (Coxa Plana)

A. Definition- Avascular necrosis of the femoral head
B. Incidence- higher in boys, higher in whites.
C. Pathophysiology- cause unknown, but there is a temporary disturbance of circulation to the femoral capital epiphysis thus causing ischemic necrosis of the femoral head
D. Stages (4)
   1. Avascular stage- causes degenerative changes, flattening of femoral head
   2. Fragmentation or Revascularization stage- gives a mottled appearance on xray
   3. Reparative stage- reossification, new bone formation
   4. Regenerative stage- healing and reformation of the femoral head
E. Clinical Manifestations
   1. Intermittent appearance of limp on affected side
   2. Pain, soreness, Limited ROM
F. Diagnosis
   1. X-ray
G. Therapeutic Management
   1. Goal: to keep femur head in acetabulum
   2. Initially: decrease inflammation, restore motion with rest, NSAIDS, ROM
   3. To contain the head of the femur: non weight bearing devices like abduction braces, or leg casts
   4. Without containment: Femur head remolds into mushroom shape, hip unstable
   5. Surgery- reconstruction of femoral head, stabilization of femoral head
H. Prognosis- outcome is related to early and efficient treatment and age of child
I. Nursing Considerations
   1. Education on management, compliance with devices PRN

2. Family and patient support- hard for an active child to slow down

II. Slipped Femoral Capital Epiphysis

J. Definition- disorder of adolescents in which the growth plate in the hip is damaged and the femoral head slips and stretches blood vessels to the epiphysis.

K. Incidence
1. Occurs most frequently in pre-adolescence-? hormone influence
2. Obese children, very tall, thin, with rapid growth more so affected

L. Diagnosis
1. X-ray
2. Physical exam- externally rotated leg, flexion issues, shortening

M. Clinical Manifestations
1. Pain- hip, groin, thigh, or knee
2. Limp, inability to bear weight

N. Therapeutic Management / Nursing Considerations
1. Treat as early as possible to prevent avascular necrosis
2. Non-weight bearing, crutch usage, sports restriction
3. Surgical- pinning using screws

O. Complication- some will develop condition in opposite hip

III. Scoliosis

P. Definition- lateral (sideways) curvature of spine, spinal rotation causing rib asymmetry.

Q. Pathophysiology
1. Most no apparent cause (idiopathic) -vs- Genetic?
2. S Shaped curve of spine that worsens as child grows

R. Clinical Manifestations
1. Parents may notice ill-fitting clothes with uneven lengths
2. No pain until curve becomes severe

S. Diagnostic Evaluation
1. Observe for asymmetry of shoulder, scapular/flank shape, hip height
2. Scoliometer may be used to measure truncal rotation
3. X-ray

T. Therapeutic Management
1. Current
   - Observe for mild curves (10-25 degrees)
   - Orthopedic intervention for moderate curves (25-45 degrees)
   - Surgical intervention and fusion for severe curves (45-50 degrees)
2. Bracing- used for slowing progression of curvatures
   - 2 main types
     1.) Boston brace or Wilmington Brace
     2.) Thoracolumbosacral orthosis (TLSO)
   - Brace education: Wear prescribed amount of time daily, support for body image, skin protection

F. Surgical Repair
1. May be required for severe curves > 45 degrees
2. Spinal Fusion- to realign and straighten the spine using internal fixation
3. Post-op care- maintain proper body alignment, log rolling, back brace prn, wound assessment, vital signs, neurologic status of extremities, pain control, I&O, Bowel/Urinary status, gentle ROM with PT, ambulation with PT

Juvenile Rheumatoid Arthritis

A. Definition- chronic inflammation of synovium and joint effusion, autoimmune process
    - Idiopathic chronic inflammation of synovium and joint effusion
    - Leads to erosion, destruction and fibrotic changes of articular cartilage
    - May develop adhesions between joint surfaces and ankylosis of joints if persists

B. Etiology- unknown cause, usually starts before age 16, as early as 1-3, girls more affected

C. Clinical manifestations
    - Affected joints warm, tender, stiff with decreased ROM. Worse in AM
    - Exacerbations/Flare ups can happen
    - Complications associated with disease: uveitis, G&D issues

D. Diagnosis
    - H&P= joint pain/arthritic pain in child for > 6 weeks is a clue
    - ESR/CRP "may" be elevated- Not definitive
    - Eye exam for uveitis

E. Therapeutic Management
    - No cure
    - Goals- control pain, preserve joint motion/function, promote normal G&D

F. Medications
    1. NSAIDS – naproxen, ibuprofen
    2. DMARDS- "disease modifying antirheumatic drugs" (methotrexate and sulfasalazine) which can be taken with NSAIDS to slow progression
    3. Biologic Agents- etanercept (Enbrel), infliximab (Remicade) and adalimumab (Humira) which reduce inflammation and prevent joint damage
    4. Glucocorticoids- steroids

G. Long Term Care
    - Unrealistic pain free life, but less pain is achievable
    - Stay active, but rest often
    - Water therapy beneficial, physical therapy, occupational therapy
    - Need to be encouraged to attend school, school nurse can aid in rest periods
    - Promote independence, normal activities, support
    - Heat relieves pain/stiffness. Safety with heating blankets, hot packs etc.
    - Morning routine: wake, take meds, rest ~1 hr, hot shower/bath, gentle ROM