

# THE CHILD WITH A MUSCULOSKELETAL CONDITION

CHAPTER 24

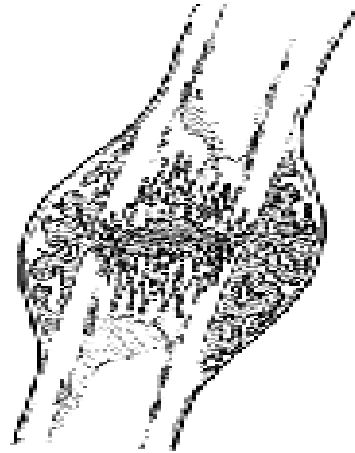
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## OVERVIEW OF MUSCULOSKELETAL SYSTEM

- Muscular and skeletal systems work together.
- Arises from the mesoderm in the embryo
  - A great portion of skeletal growth occurs between the 4th and 8th weeks of fetal life.
- Supports the body and provides for movement
- Locomotion develops gradually and in an orderly manner.

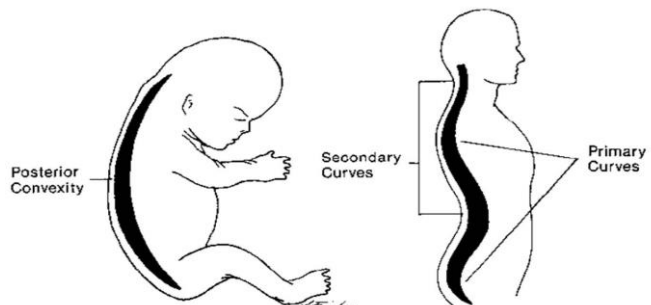
## WHAT ARE SOME DIFFERENCES? (CHILD VS. ADULT)

- Bone not completely ossified
- Periosteum is thicker
- Callus formation is faster
- Stronger due to lower mineral content
- Damage at epiphyseal plate
  - Interferes with longitudinal growth



## THINGS TO OBSERVE

- Spinal Curvature
  - “C” in newborn
  - Double “s” in childhood
- Gait
- Muscle tone
- Neurological exam
- Diagnostic testing



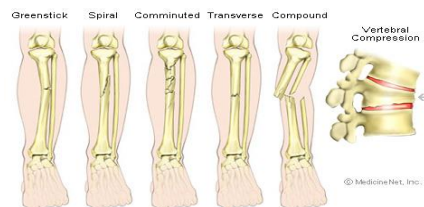
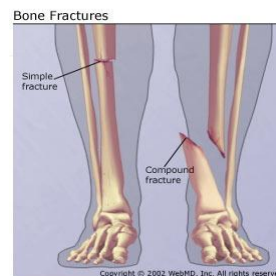
## PEDIATRIC TRAUMA

**R**est  
**I**ce  
**C**ompression  
**E**levation

- Soft tissue injuries
  - Contusions
  - Sprains
  - Strains

## PEDIATRIC TRAUMA

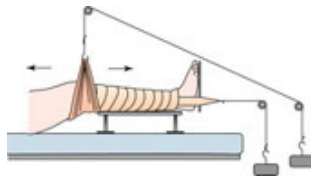
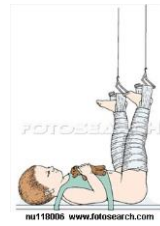
- Fractures
  - Simple
  - Compound
- Greenstick
- Complete
- Spiral



Typical Bone Fractures

## TYPES OF TRACTION

- Bryant's – Figure 24-3
- Buck's
- Russell - Figure 24-4
- Skeletal – Figure 24-6



## CHECKLIST FOR TRACTION APPARATUS

Weights  
hanging freely

Weights out of  
reach of the  
child

Ropes on the  
pulleys

Knots not  
resting against  
pulleys

Bed linens not  
on traction  
ropes

Countertraction  
in place

Apparatus does  
not touch foot  
of bed

## CAST AND SPLINTS

- Can be made from a variety of materials
- Child is at increased risk for
  - Impaired skin integrity
  - Compartment syndrome
    - Progressive loss of tissue perfusion because of an increase in pressure caused by edema or swelling that presses on the vessels and tissues
    - If not carefully monitored, significant complications can occur.



## NURSING CARE OF A CHILD IN A CAST

- Elevate effected extremity on a pillow.
- Perform frequent neurovascular checks.
- Teach cast care and how to support cast, safe transfers to or from chair or bed, how to use crutches safely, and when a cast is too loose or too tight.



# COMPARTMENT SYNDROME

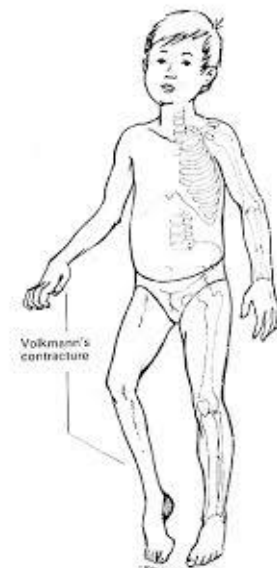
Pressure within one or more of the muscle compartments of the extremity compromises circulation resulting in an ischemia edema cycle with compromised neurovascular status

- Increased pain that is unrelieved with elevation or medication
- Intense pain when passively moved
- Paresthesia or numbness
- Pallor

Nursing:

- Monitor and notify MD if compartment syndrome is suspected
- Loosen the constrictive dressing or cut bandage or tape
- Elevate the extremity and apply ice
- Prepare for a fasciotomy

# VOLKMANN'S ISCHEMIA



## NURSING CARE

- **Neurovascular checks every 1-2 hours**
    - Peripheral pulse rate and quality
    - Color
    - Capillary refill time
    - Warmth
    - Movement and sensation
  - Nursing Care
    - Skin care
    - Stool softeners
    - Deep-breathing, coughing
    - Pain control
    - ROM
    - Education
- 

## MUSCULOSKELETAL DISORDERS

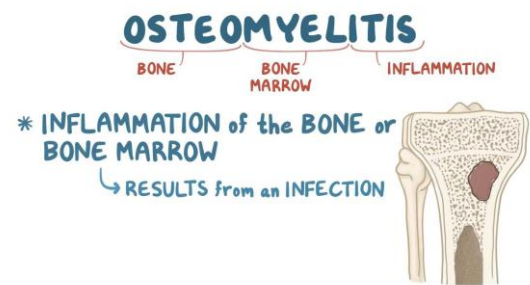


# OSTEOMYELITIS

Infection in the bone

- Causes
- Sign and Symtoms
  - Pain
    - Caused from exudate (pus) that collects under the marrow and cortex of the bone
  - Muscle Spasms
  - Inflammation
  - Elevated WBC and ESR

- Treatment and Nursing care
  - IV antibiotics – 4-6 weeks
  - Wound care
  - Immobilization
  - Neurovascular checks
  - No weight bearing
  - Standard precautions



## Manifestations

- Hypertrophy of calf muscles
- Weakness
- Clumsiness
- Gower's maneuver

## Lab

- Creatinine phosphokinase
- Muscle biopsy
- Myelogram
- ECG

# DUCHENNE'S MUSCULAR DYSTROPHY

Most common form of MD

Treatment

Supportive  
Quality of life  
Multidisciplinary team





Gower's Maneuver

Hypertrophy of calf muscle



## LEGG-CALVE'PERTHES

Aseptic necrosis of the femoral head can be unilateral or bilateral

- Signs & Symptoms

- Painless limp
- Limited mobility
- Hip stiffness

- Diagnostic

- X-ray
- Bone scan

- Treatment

- Keep femoral head in hip socket – traction, casts
- No weight bearing

- Prognosis

- Spontaneous healing
  - 2-4 years



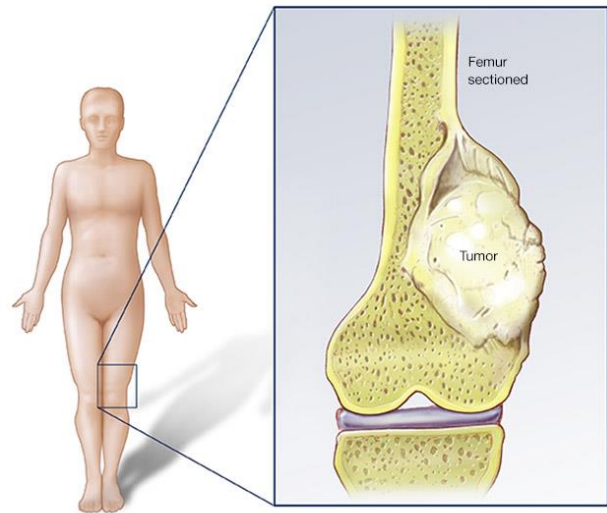
Normal hip

Hip with perthes

# OSTEOSARCOMA

Malignant tumor of the long bones

- Sign and Symptoms
  - Pain
  - Swelling at site
  - Fracture
- Treatment/Nursing Care
  - Radical resection
  - Amputation
  - Psychosocial needs

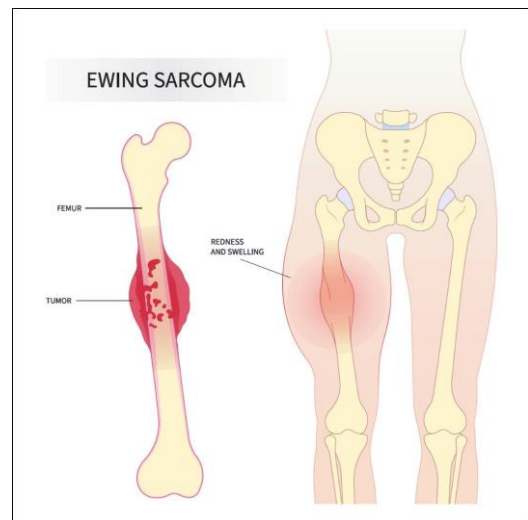


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# EWING'S SARCOMA

Malignant growth that occurs in the marrow of the long bones.

- Sign and Symptoms
  - Pain
  - Swelling at site
  - Fracture
- Treatment/Nursing Care
  - Radiation
  - Chemotherapy
  - No vigorous weight bearing
  - Manage of side effects from treatment
  - Education



	Osteosarcoma	Ewings Sarcoma
Onset	10-15 years of age	10-20 years of age
Site	Malignant tumor in long bones	Malignant tumor in marrow of long bones
Mets	Usually to lungs** or other bones, brain	Usually to lungs or other bones
Symptoms	Pain, swelling, fractures	Pain, swelling, fractures
Diagnosis	Biopsy, CT, bone scan, X-ray	Biopsy, CT, bone scan, X-ray
Treatment	Radical resection, Amputation	Radiation, chemotherapy

## JUVENILE RHEUMATOID ARTHRITIS

### Systemic Inflammatory disease

- Joints
- Connective tissues
- Viscera

### Types

- Systemic
- Poly arthritis
- Oligo Arthritis

## Treatment/Nursing Care

- Supportive
- NSAIDS with food
- Immune Suppressant medications
- PT/OT/ROM
- Education
- Flat mattress
- Resting splints-prevent flexion contractures
- Moist heat and exercise
- Plan rest periods during the day

## JUVENILE RHEUMATOID ARTHRITIS

### Diagnosis

- X-rays
- Lab
- Clinical manifestations
- Aspiration of joint fluid

## TORTICOLLIS (WRY NECK)

Neck motion is limited and the cervical spine is rotated because of shortening of the sternocleidomastoid muscle.

### Sign and Symptoms

- Holding head to side of involvement
- Chin tilted in opposite direction
- Palpable mass

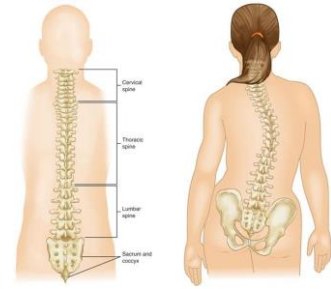
### Treatment/Nursing Care

- ROM
- PT
- Surgery - > 2 years
- Supportive care



# SCOLIOSIS

- More common in girls
- Two types
  - Functional—caused by poor posture
  - Structural—caused by changes in the shape of the vertebrae or thorax
    - Usually accompanied by rotation of the spine.
    - Hips and shoulders may appear to be uneven.

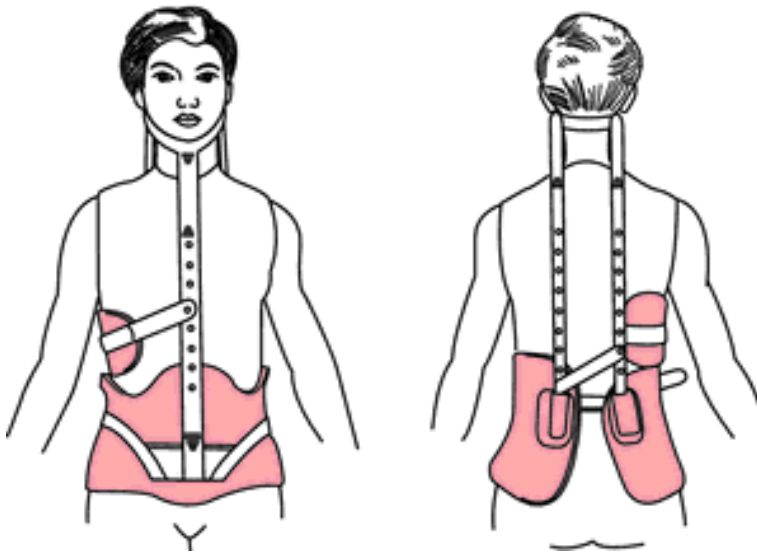


## Depends on extent of curvature

- Curve < 20 degrees – close monitoring
- Curve between 20-40 degrees
  - Milwaukee or Boston brace
- Curves > 40 degrees – surgery

## Post-op care

## SCOLIOSIS TREATMENT



## MILWAUKEE BRACE

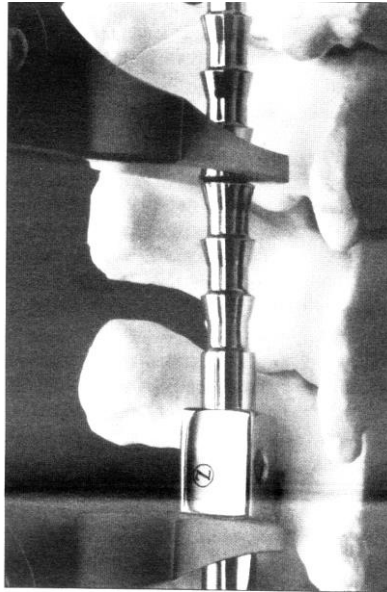
Should be worn approximately 16 to 23 hours a day and is worn over a T-shirt to protect the skin

## SCOLIOSIS NURSING CARE

- Annual screening
  - Observe curvature and shape of back
    - Asymmetry of the back while the child bend forward
    - Prominent scapula
    - One shoulder higher than the other
    - Protruding hip
    - One arm appears longer



Boston brace



Harrington rod

## SPORTS INJURIES

- Sports-specific examinations are given for those involved in strenuous activity on entry into middle school or high school.
- Common injuries include
  - Concussion
  - “Stingers” or “burners”
  - Injured knee
  - Sprain or strained ankle
  - Muscle cramps
  - Shin splints



## CHILD ABUSE



- Types of child abuse
  - Emotional abuse: verbal acts destroys self-esteem
  - Emotional neglect: intentional omission of verbal or behavioral actions
  - Sexual abuse: involves acts performed on a child for sexual gratification of the adult
  - Physical neglect: failure to provide for basic needs
  - Physical abuse: deliberate infliction of injury

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## NURSING IMPLICATIONS (CHILD ABUSE)

Be attentive to:

1. Maternal-infant bonding
2. Neglect in seeking medical attention
3. Runaway teenagers
4. X-rays for multiple fractures
5. Chronic school absenteeism
6. Failure to thrive
7. Bruises in various stages
8. Spiral Fractures