Common Causes of Atraumatic Leg Pain in Children and Adolescents

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Role of Orthopedist

- Determine the ***Source*** of pain or limp
- Compile a list ***Differential Diagnoses***
- Order appropriate ***Diagnostic Tests***
- Conditions causing pain may range from benign and self-limiting to those where early detection may be lifesaving

History/Review of Systems

- **Toddler**: has patient stopped all weight bearing When did patient start walking?
- **Older Child**: Have sporting or social activities been altered?
- Any other symptoms? Fever, Illness, Rash
- Recent Procedures

Pattern of Onset:

Acute

- Infection
- Malignancy
- Trauma

Gradual (Months)

- Inflammatory (Synovitis, JIA)
- Mechanical

Quality of Pain

- Constant
- Intermittent
- Transient
- Referred Pain: Knee pain requires hip exam

Timing of Pain

Morning

Inflammatory (JIA)

Night

Benign
"Growing Pain"

Osteoid Osteoma

After Activity

Overuse

Physical Exam:

- **Gait**: limb rotation; joint mobility
- **Standing**: Pelvic obliquity, Trendelenberg test
- **Supine on Exam Table**: Resting position of limb, Asymmetry, Erythema, Swelling (use contralateral limb for comparison), Puncture wounds, Tenderness

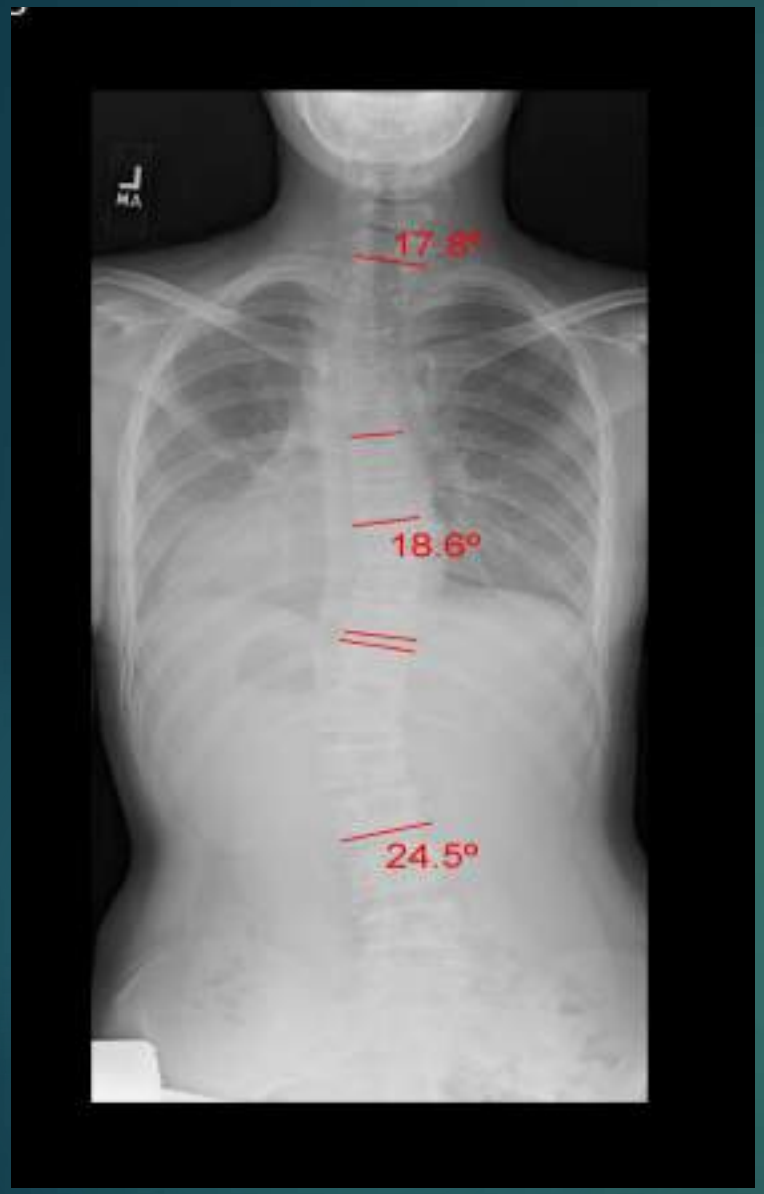
- Every joint of the affected limb needs to be assessed through a range of motion

Imaging

- Plain Radiographs AP and Lateral views (joint above and below)
- Bone Scan
- CT
- MRI

Laboratory Tests

- CBC with differential
- CRP
- ESR



13 + 6 yo female with c/o scoliosis, back and leg pain. No trauma; several trials of PT, Pilates, Yoga and Chiropractic care

Common Causes of Lower Extremity Pain in Children Based on Patient Age

< 6 years of Age

- Toddler's Fracture
- Infection
- Inflammatory Arthritis (JIA)
- Discoid Meniscus
- Non Accidental Trauma
- Benign vs Malignant Tumor

6-10 years of Age

- Overuse Apophysitis
- Transient Synovitis Hip
- Legg-Calve-Perthes Disease
- Osteomyelitis
- Septic vs. Intlammatory Arthritis
- Benign vs. Malignant Tumors

Common Causes of Lower Extremity Pain in Children Based on Patient Age

> 10 years of age

- Stress Fracture
- Apophysitis
- Slipped Capital Femoral Epiphysis (SCFE)
- Osteochondritis Dissecans
- Arthritis (Inflammatory vs. Septic)
- Accessory Navicular/Tarsal Coalition
- Benign vs Malignant Tumor

11 year old female dancer with c/o pain in left knee with impact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Infection

- Spectrum of Presentations
- Index of Suspicion
- May involve Bone (Osteomyelitis), Joint (Septic Arthritis) or Muscle

History and Physical

- Recent Illness
- Fever (Current or Recent)
- Swelling: Compare to contralateral side
- Erythema, Warmth

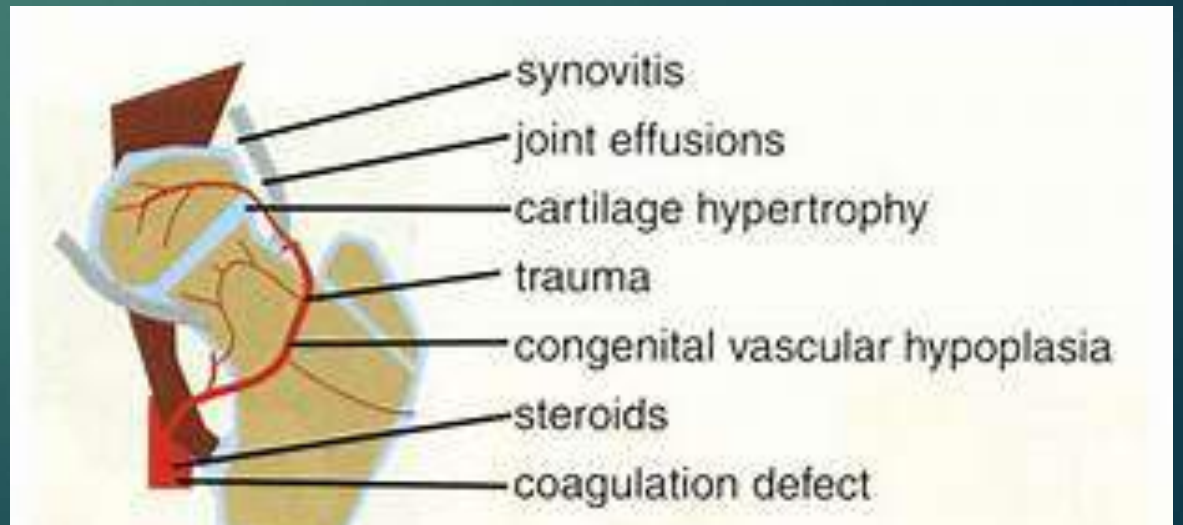
Diagnostic Studies

- Plain Radiographs
- MRI
- Ultrasound
- Bone Scan
- Lab Studies: CBC with differential, CRP, ESR

4 + 8 yo male with several month history of a limp. No trauma. Seen by PMD, X-Ray of foot ordered diagnosed with “growing pains.”

Legg-Calve-Perthes Disease

- Childhood hip disorder
- Ischemic necrosis to the growing femoral head
- Unknown etiology
- Permanent deformity to femoral head



Four Stages of LCPD

- Initial (increased sclerosis)
- Fragmentation (lasts approx. 1 year)
- Reossification (lasts approx. 3-5 years)
- Healed (may have permanent deformity)

Epidemiology of LCP

- Ages: 5-8
- Male: Female =5:1
- Bilateral 10-15%
- Delayed Bone Age
- Hyperactive
- May appear younger than chronologic age

Clinical Presentation of LCP

- Pain: mild
- Limp: intermittent
- Limited hip motion of insidious onset (IR and abduction)

Treatment of LCP

- Little evidence to definitively support any particular treatment over natural history of disease except in specific age related groups
- NSAIDS
- Physical Therapy
- Activity Modification
- Hip Abduction Bracing (Femoral Head Containment)
- Surgery (older age group)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13 yo male; limping for several months, pain in left hip and occasionally left knee. Able to weightbear but hurts. Went skiing over the winter holiday which seemed to exacerbate his symptoms.


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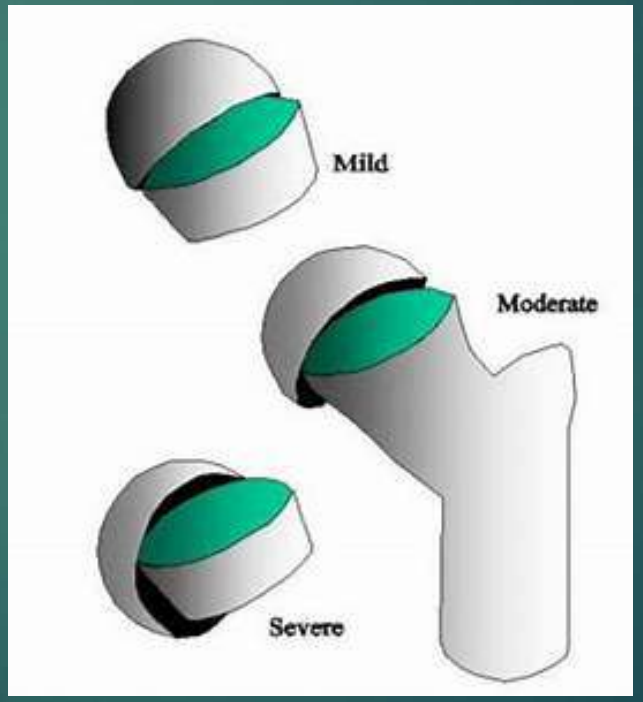
Slipped Capital Femoral Epiphysis (SCFE)

- Femoral Epiphysis Moves Postero-Inferior Relative to the Metaphysis of the Femoral Neck



Slipped Capital Femoral Epiphysis Epidemiology

- 60% males
- .2/100,000 Japan
- 10/100,000 NE United States
- Mean duration of sxs= 5 months
- Mean age dx: boys= 13.5 years
  girls=12 years

Slipped Capital Femoral Epiphysis (SCFE) Etiology

- Biomechanical: Half of affected patients >95 percentile weight for age
- Biochemical Factors: Hormonal effects of Increased growth hormone

SCFE Classification

- Stable: Patient able to weight bear
- Unstable: Patient unable to weight bear with or without crutches

Physical Exam (SCFE)

- Supine resting position of affected limb shortened and externally rotated
- Passive hip flexion produces abduction and external rotation

SCFE Imaging

- Plain Radiographs: AP and Frog Lateral
- Displacement of femoral epiphysis postero-inferior relative to femoral metaphysis
- Klein's Line (AP Pelvis)
- MRI : Pre-slip

Treatment of SCFE

- Prevent Progression of the Slip
- Avoid Complications

- Single Screw Fixation

SCFE Complications

- Osteonecrosis
- Chondrolysis

- Retroversion
  (Femoral Acetabular Impingement)

12 + 8 yo female slipped and fell 2 days prior, unable to bear weight even with assistance. Some mild intermittent knee pain prior to this fall.

Complications: Osteonecrosis

Lower Extremity Pain in Children

- Obtain a focused history
- Carefully examine the patient
- Compare with the contralateral side
- Order appropriate tests when in doubt
- Know what is in the differential diagnosis