



THE CUTTING
EDGE
OF PEDIATRICS



The Limping Child

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Key Points

- Focus on the history and physical exam for clues to an etiology of limp
- Base your work-up (and its urgency) on your differential diagnosis

By the End of This Lecture...

- Know the questions to ask patient/family presenting with a limp
- Perform a physical exam that helps analyze a limp
- Form a differential diagnosis for a limp
- Know which basic tests to order in the initial work-up of a limp

History – Essential Questions

- Onset sudden or gradual?
- Was there a history of trauma or sickness?
- Is there pain? Timing of pain?
- **Is the child sick/associated symptoms?
- Can the problem be localized?
- Is it getting better, worse or staying the same?



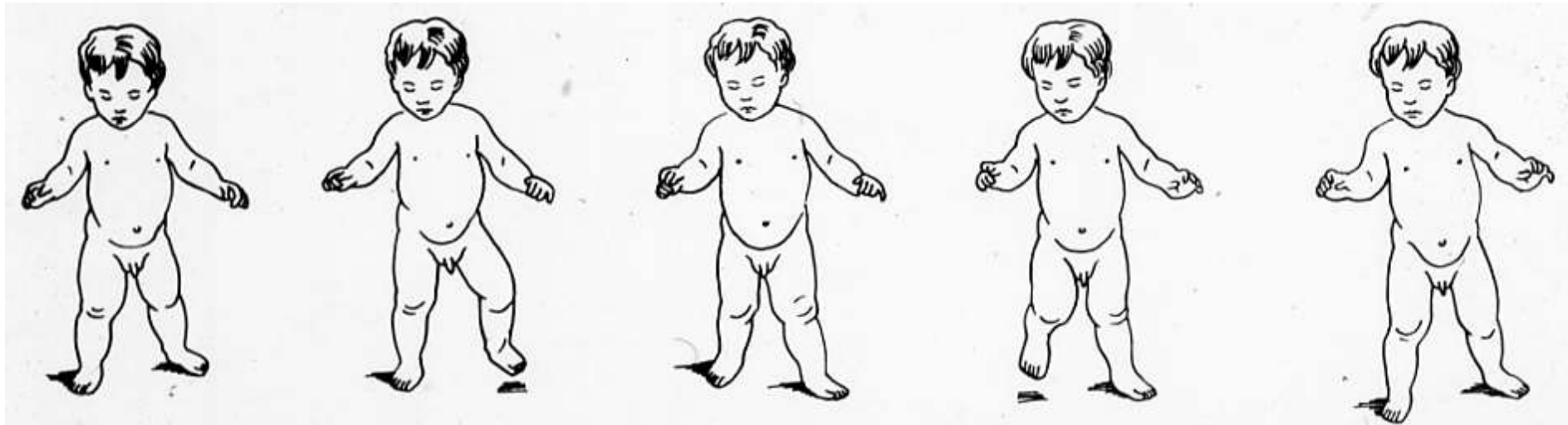
Examination

Watch the child walk and run!

- Outside of exam room (in hallway)
- Dressed in shorts
- Walk/run up and down the hallway as many times as needed
 - With increased reps child may become tired and limp may become more obvious



Toddler Gait



**Feet wide
apart**

**Feet
externally
rotated**

**Arms
high for
balance**

**Lands on
toes, not
heel**

Toddler's Gait



Gait Abnormalities – 5 Unique Limp

1. Antalgic
2. Trendelenburg
3. Spastic
4. Muscle Weakness
5. Short Limb Gait



Antalgic (Painful) Limp



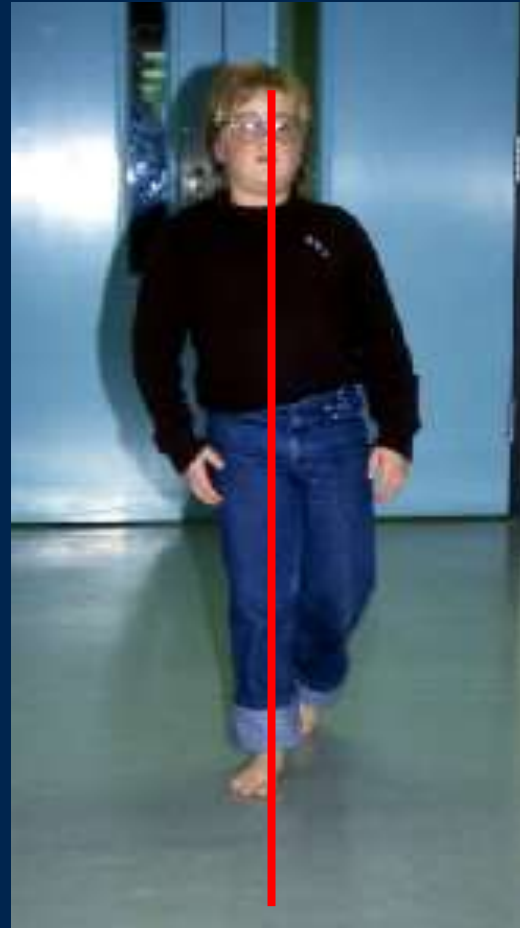
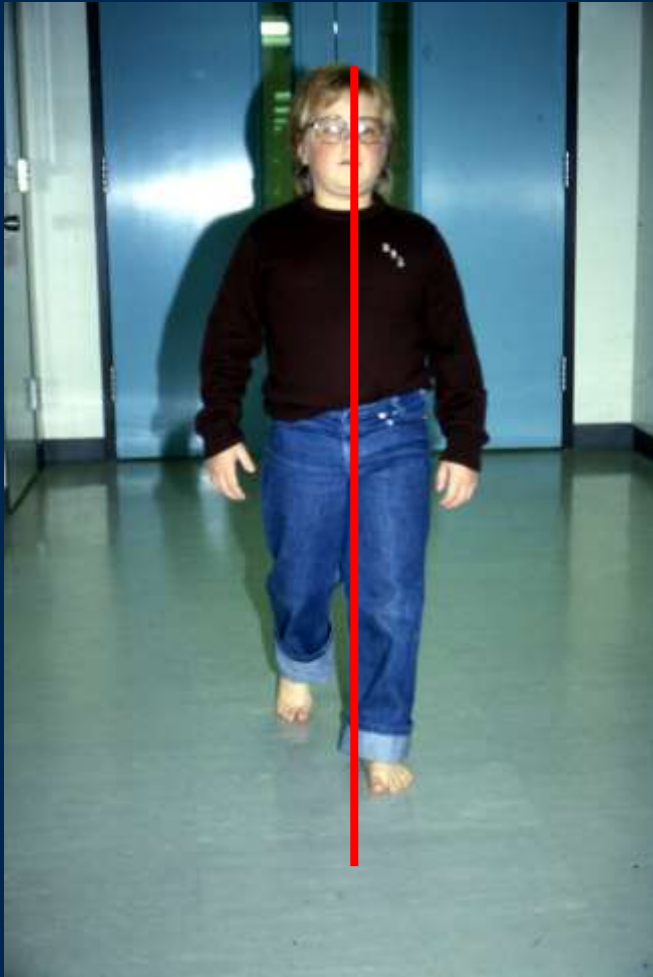
- Minimum single limb support time on affected side
- Shortened, quick stride by opposite side

Trendelenburg Gait

- Secondary to hip abductor weakness
- Seen in patient with hip pathology and hemiplegic cerebral palsy



Trendelenberg Gait



Trendelenberg Gait



DDH- painless until adolescence

Note waist crease from trunk shift of Trendelenberg gait

Spastic Gait

- Affects the whole limb
- Look for effects of multiple joints at one time
- Look for signs of contracture
- Get child to run → can pick up on subtle upper extremity posturing



Muscle Weakness Gait

- Can be seen in conditions such as Duchenne muscular dystrophy
- Perform Gower's test to rule this out



Short Limb Gait

- Leg length causes a limp when difference gets between 3-5%



Examination – Tabletop Exam

- Exam from buttock to feet
- Subtle exam findings
 - Muscle atrophy
 - Swelling
 - Discoloration
- Search for point of maximal tenderness
- Range every joint, including spine flexion/extension

Differential Diagnosis

- Based on history and physical exam
- Basis for the urgency/depth of your work-up
- Want to rule out BAD things
 - Fractures
 - Infections
 - SCFE
 - Tumors
 - Developmental hip dysplasia

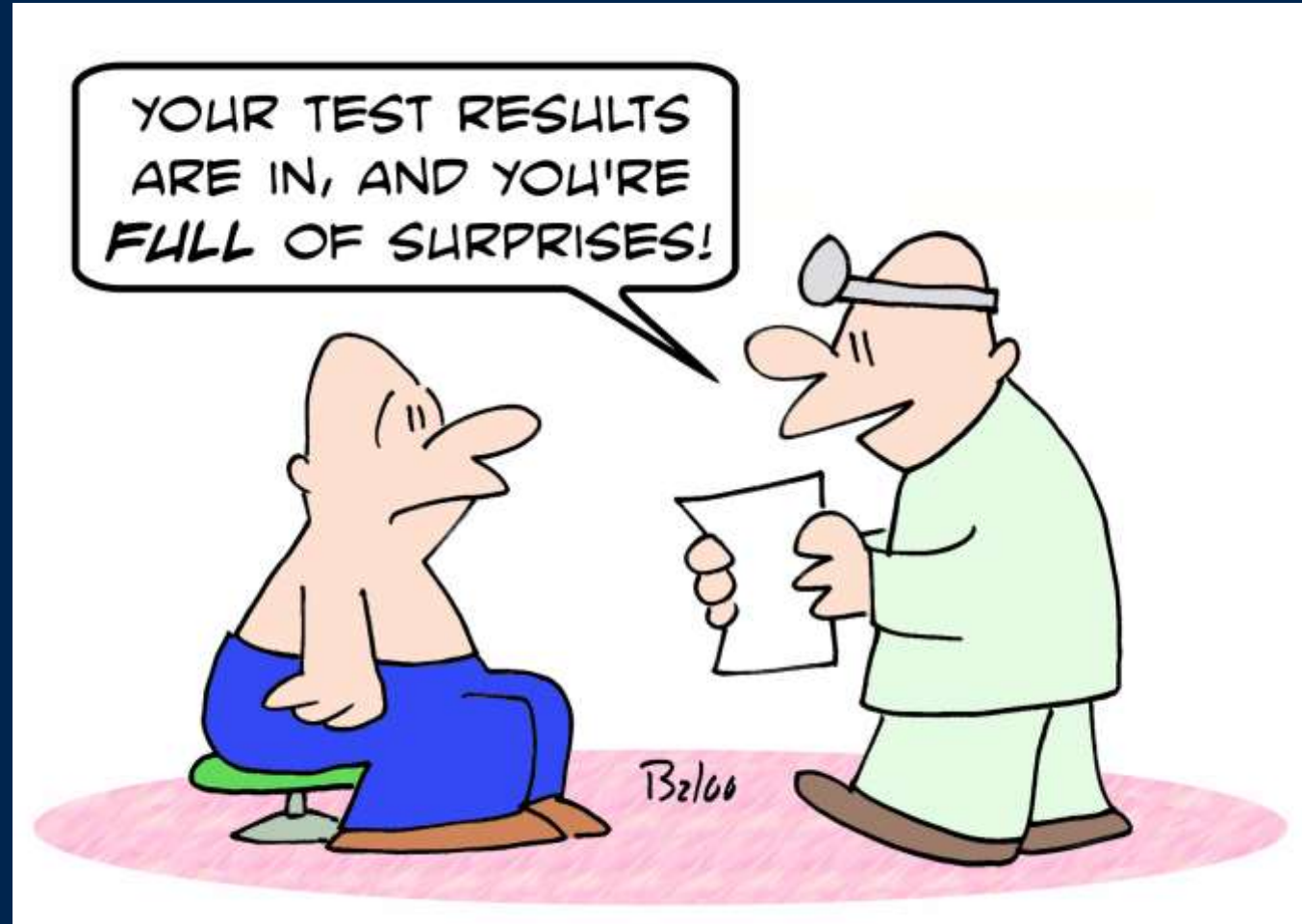


Growing Pains

- Do NOT cause limping
- Typically transient aching of the lower legs at night that is variable intermittent and resolves with time
- Worrisome signs:
 - Frequent night awakening
 - Unilateral pain
 - Limp or other functional problems during the day

Diagnostic Testing

- X-rays
- Blood work
- Advanced imaging



Radiographs

- Good starting point
 - Quick
 - Widely available
 - Sensitive
 - Specific

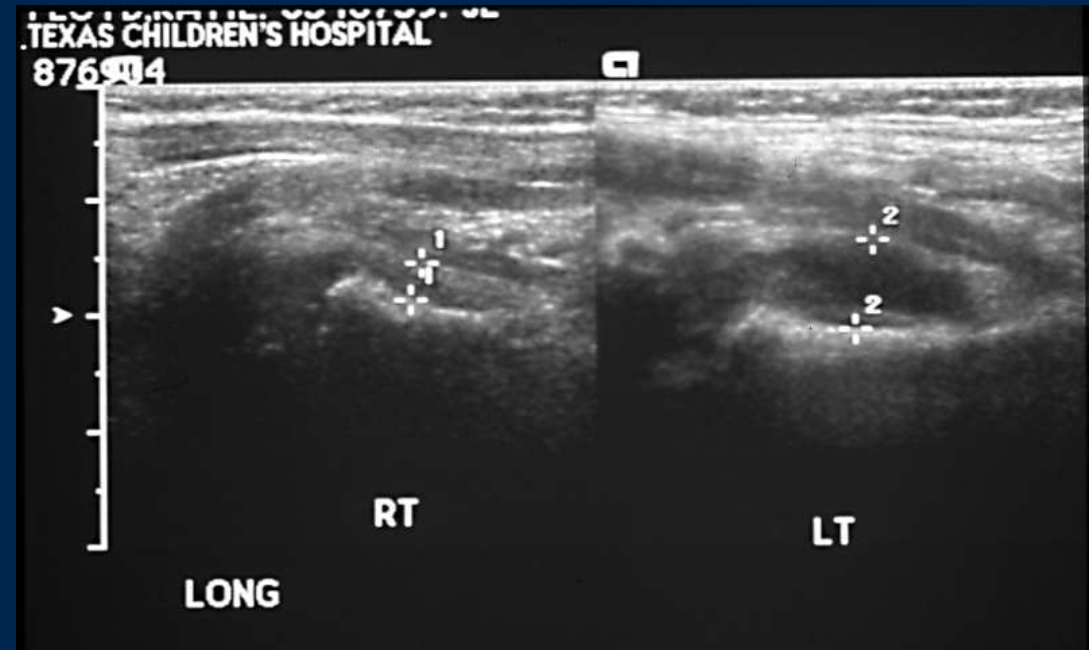


Radiographs – Helpful Tips

- Oblique radiographs for subtle fractures
- Will NOT reveal early signs of osteomyelitis
- Comparison views can be helpful
- If cannot localized symptoms, image entire lower extremity

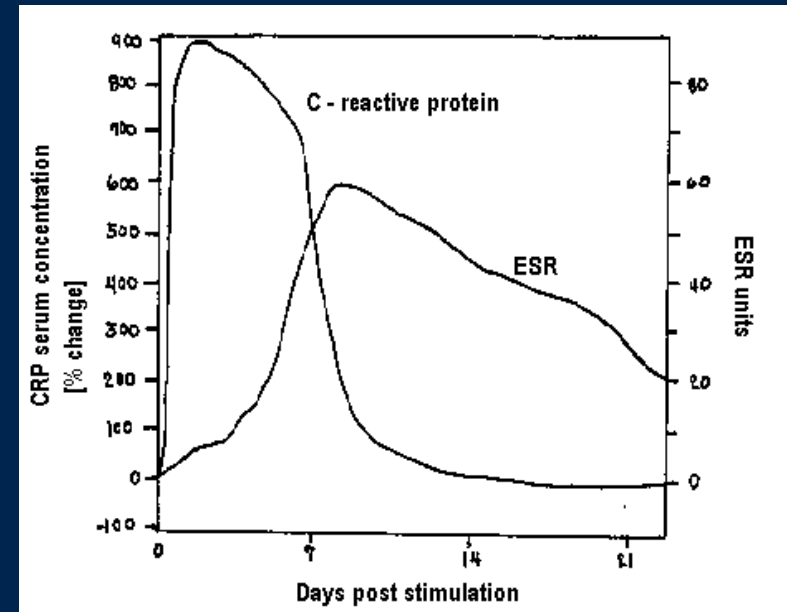
Other Imaging

- Ultrasound
 - Study of choice for evaluation of hip effusion
- MRI
 - Valuable for limp that originates in pelvis and spine
 - Secondary test
- Bone Scan



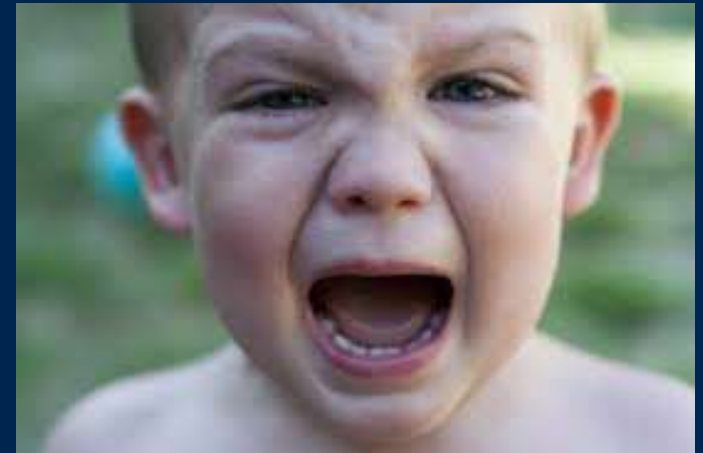
Blood Tests

- Most valuable when child presents with an acute, non-traumatic limp
 - **Constitutional symptoms
- WBC with differential
- Erythrocyte sedimentation rate (ESR)
- C-Reactive Protein (CRP)



Differential Diagnosis (Age 1-4 years)

- Unable to communicate well or localize pain
- Most common:
 - Fracture
 - Infection



Case #1 – Limping Child

History:

- 3 y/o female started limping after jumping off of 4 stairs, now walking with a limp favoring her right side; no associated fever/chills
- Limp started initially after fall

Examination:

- Antalgic gait, walks only on right heel
- No specific tenderness, swelling or redness

What is your leading diagnosis?

A. Fracture

B. Infection

C. Other

Case #1



Differential Diagnosis (Age 4-10 years)

- Infection
- Injury (acute and overuse)
- Hip disorders (Perthes disease, transient synovitis)
- Diagnosis of Duchenne muscular dystrophy made at this age

Case #2 – Limping Child

History:

- 4 y/o boy with history of mild IgG deficiency presents for evaluation of intermittent limp x 6-7 weeks
- Limpes intermittently, but everyday
- Complains of some ankle pain in morning and after nap
- No redness/swelling
- No specific trauma
- History of fever x 1 several weeks ago
- Family history juvenile RA

Case #2 – Limping Child

Physical Exam

- NAD
- No apparent limp on gait evaluation
- Full ROM of all joints without redness or swelling
- Non-tender throughout
- Slight decrease in girth of his right quadriceps compared to left side

What is your leading diagnosis?

A. Fracture

B. Infection

C. Other

Case #2 Limping Child

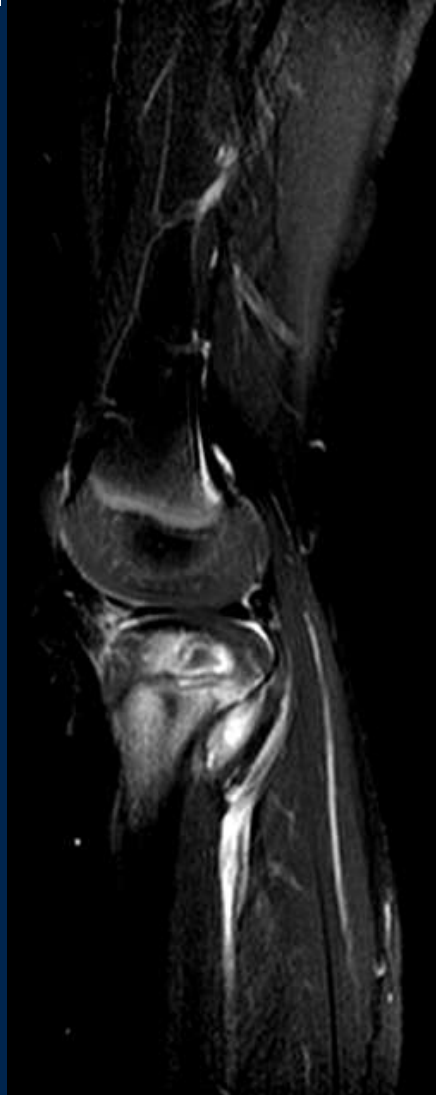
Laboratory studies

- WBC 11.7
- CRP <0.10

Case #2 – Limping Child



Case #2 – Limping Child



Differential Diagnosis (>10 years)

- Beware of SCFE that masquerades as knee or thigh pain

Case #3

- 10 y/o obese boy presents with a 2 week history of right knee pain
- No history of trauma or infection
- No fever/chills
- Physical exam:
 - Trendelenberg gait
 - Obligate external rotation of right leg

Case #3 – Physical exam



Case #3 – Physical exam



What is your leading diagnosis?

A. Fracture

B. Infection

C. Other

Case #3 – Imaging



Conclusions

- Limp Assessment:
 - History
 - Physical exam
 - Plain radiographs
 - Simple lab tests
- Usually refer for further treatment

Questions???



"I'd do better if she'd ask questions more closely matching my answers."