

# PEDIATRIC ORTHOPEDIC AND SPORTS MEDICINE UPDATE

TODD TWOGOOD MD



# ORTHOPEDIC



- Orthopaedia
- Orthos: straight or free from deformity
- Pedia: child
- Nicholas Andry (professor of medicine in Paris) 1741
- 1/3 rd of all medical problems in children are related to the musculoskeletal system.

# Orthopedic conditions surgical referral... immediately

- Slipped Capital Femoral Epiphysis (SCFE)
- Acute Septic Arthritis



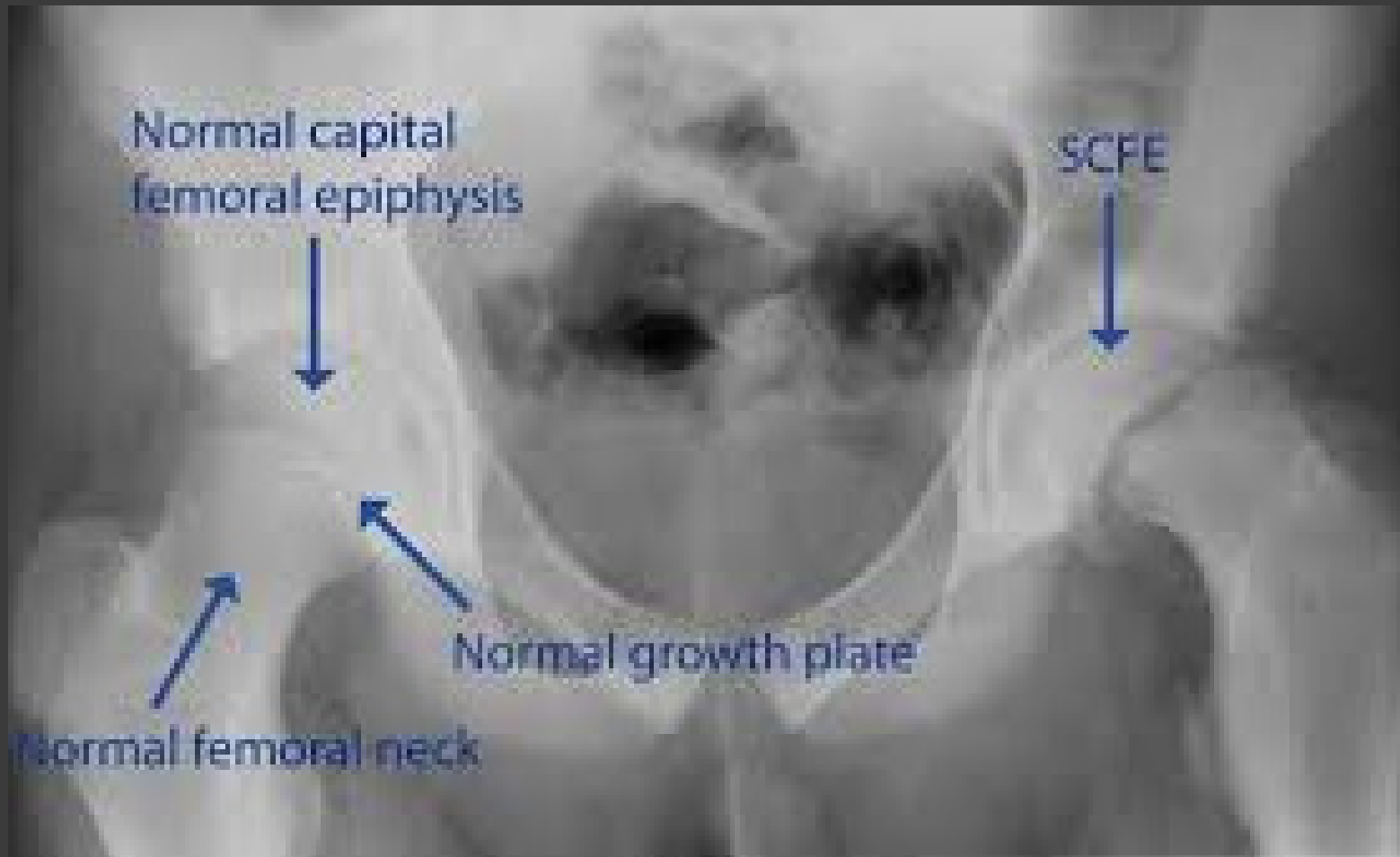
Remember this guy



# Slipped Capital Femoral Epiphysis

- ⦿ M>F, Obesity in 50%, near end of growth
- ⦿ Pain, restricted internal rotation, abduction and flexion
- ⦿ 36% will develop it on the opposite side
- ⦿ X-ray, AP, frog leg, lateral. Mild slips: subtle changes on frog leg only
- ⦿ Surgical: pin or screw placement

# SCFE



# SCFE





# Acute Septic Arthritis

- Pyogenic bacteria invade a synovial joint
- Think: *S. aureus*
- Most common: hip and knee
- Toxically ill, very tender,
- Ultrasound
- Immediate needle aspiration
- Gram stain and culture, and C&S blood
- 4-6 weeks of IV antibiotics
- Associated with Osteomyelitis



# Acute Septic Arthritis



# Orthopedic conditions

## Refer or consult....eventually

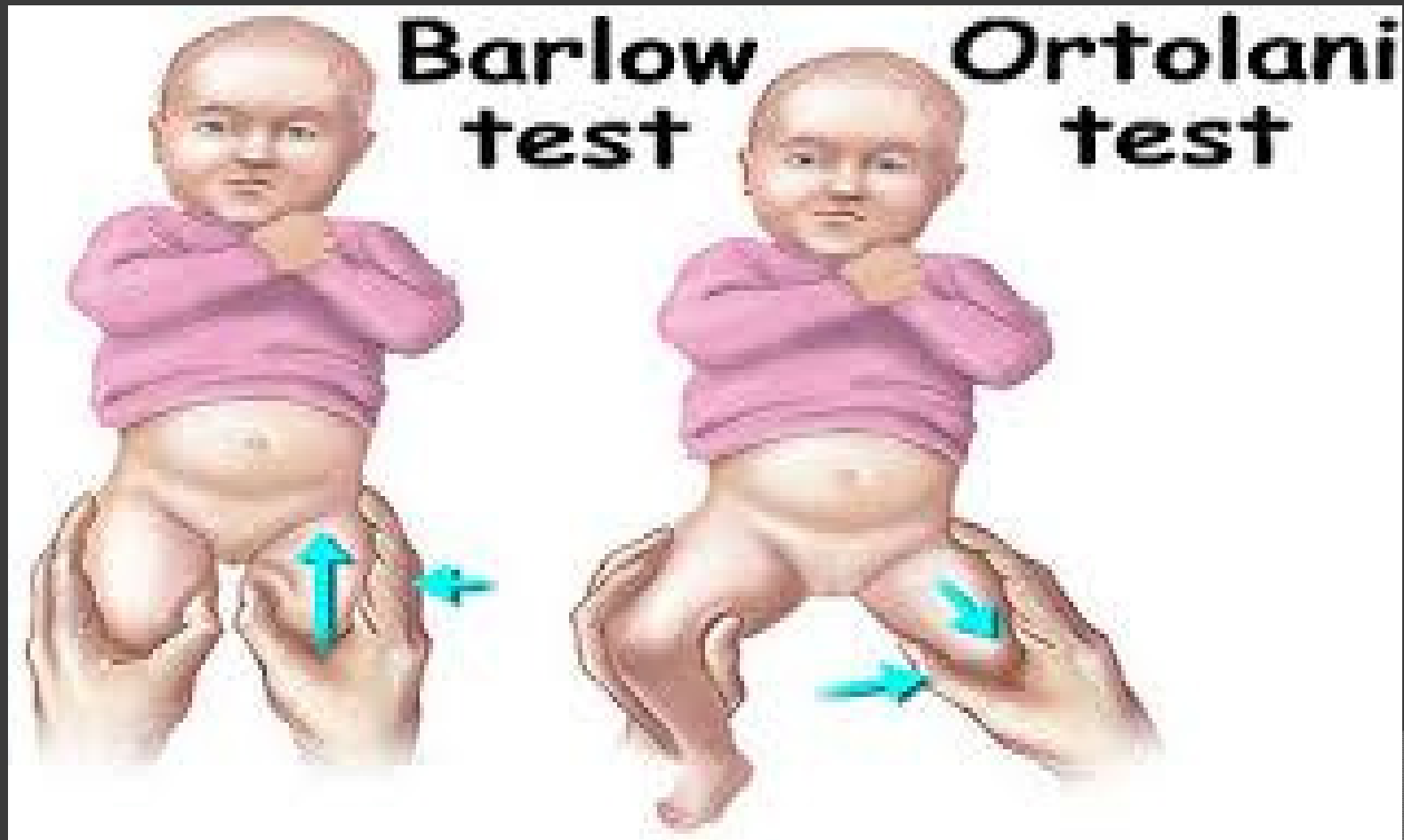
- Developmental dysplasia of the hip (DDH)
- Club foot
- Scoliosis
- Perthes' disease
- Back pain



# Developmental Dysplasia of the Hip (DDH)

- Formally known as Congenital dislocation of the hip
- 12 per 1000 births
- Girls to boys, 7:1
- Left > Right, 1 out of 5 Bilateral
- Genetic component: Joint laxity, shallow acetabula
- Hormonal: high levels of maternal estrogens, progesterone and relaxin in last few weeks of pregnancy
- Breech presentation, increased frequency

# Diagnosis



# Treatment

## Pavlik Harness 2 months

### Ultrasound or X ray



# Club Foot

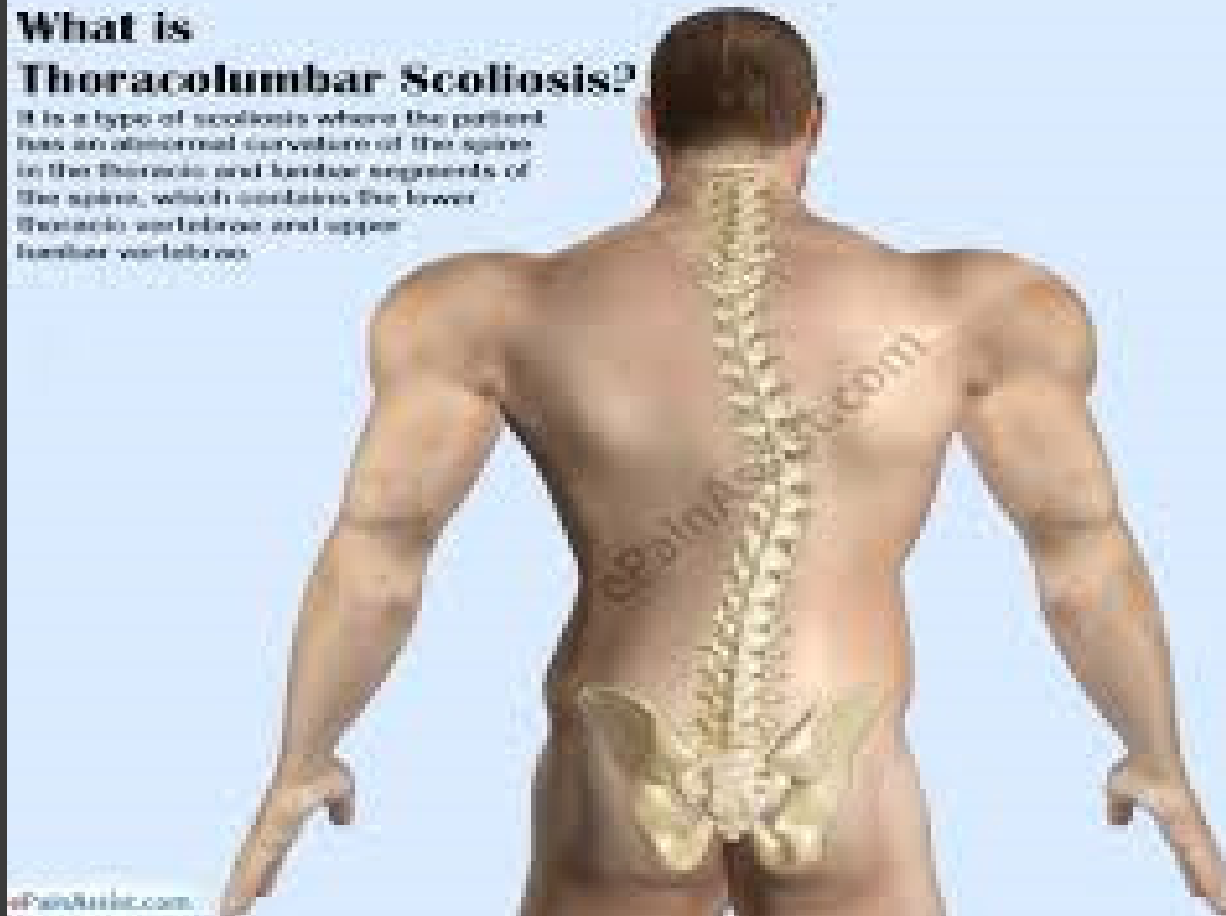
- 1 out of 1000 babies born in US
- Japan 50% less than US
- Hawaii 6x more than rest of US
- Genetic: 2<sup>nd</sup> child 4% chance (1:25 births)
- 40% involve both feet
- Orthopedic referral
- Surgery, casting



# Scoliosis

## What is Thoracolumbar Scoliosis?

It is a type of scoliosis where the patient has an abnormal curvature of the spine in the thoracic and lumbar segments of the spine, which contains the lower thoracic vertebrae and upper lumbar vertebrae.



# Scoliosis

- Lateral Curvature of the spine  $> 10$  degrees by Cobb method
- Idiopathic
- Congenital
- Secondary
- Neuromuscular
- Other



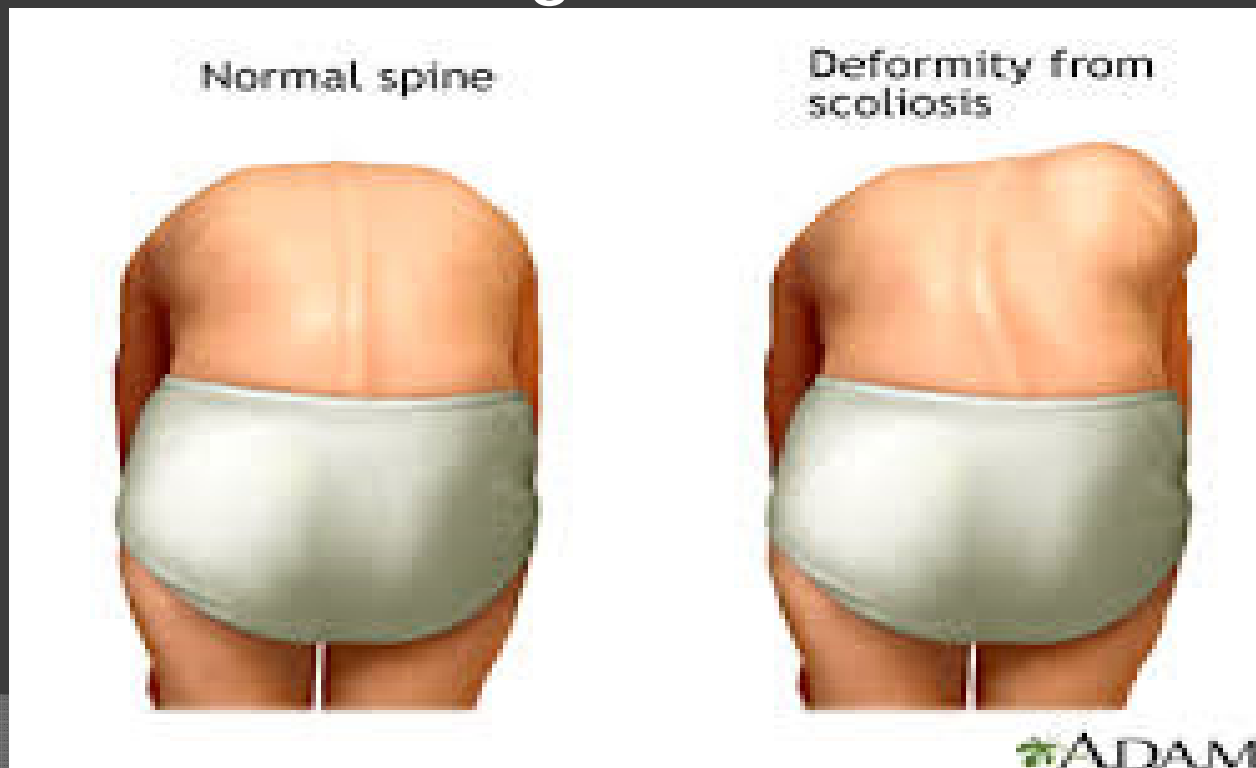


# Adolescent Idiopathic Scoliosis

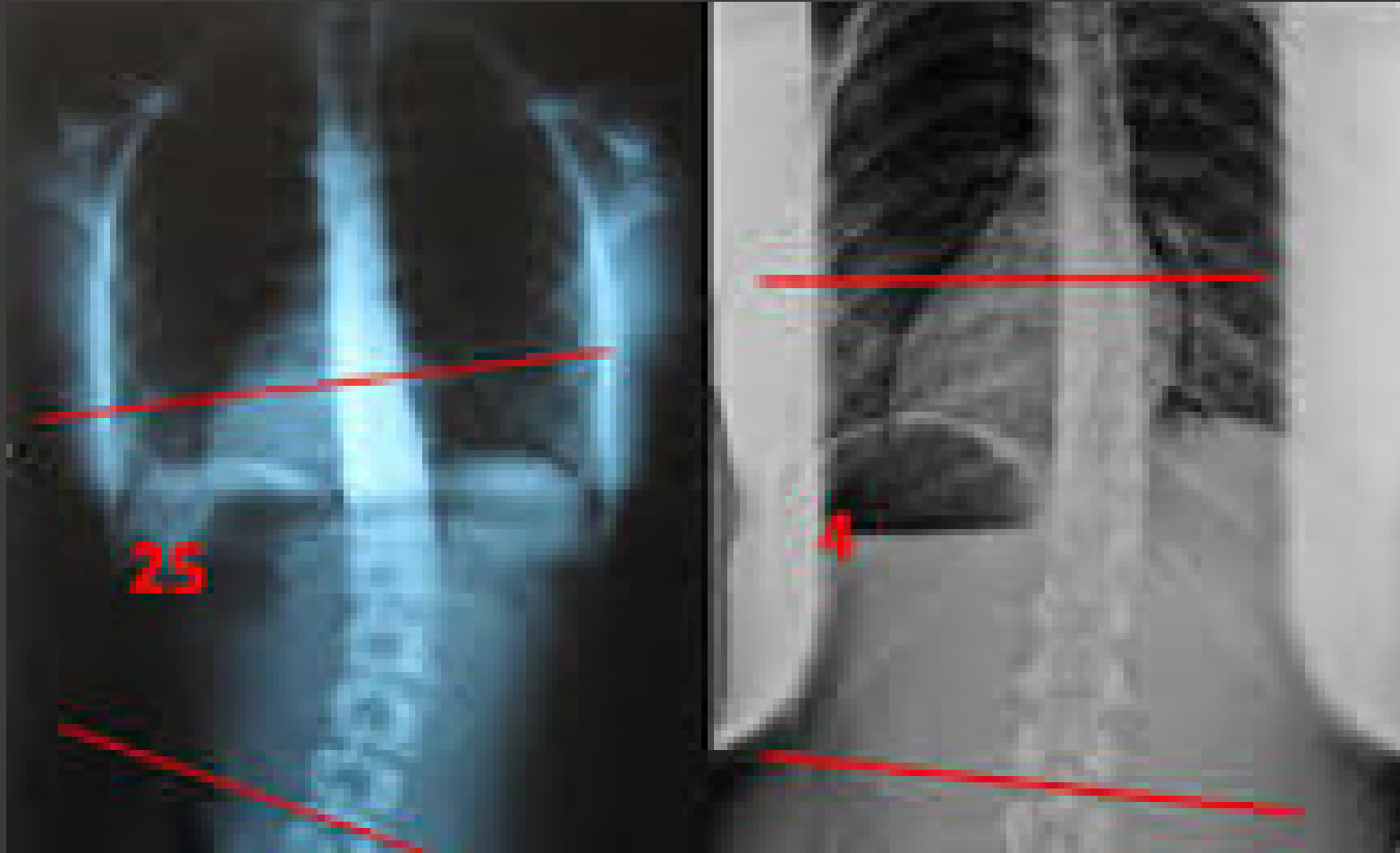
- Lateral curvature with rotation > 11 years old with no obvious cause
- Most common type
- Typically right thoracic curve
- Frequency 1.9% to 3%
- Family history around 30%
- More common in females

# Adolescent Idiopathic Scoliosis

- ◉ Adam's forward bend test
- ◉ Radiographic exam, full length standing
- ◉ MRI if neurologic deficits



# Need an X-ray!!



# Risser classification

- 0 = no ossification of ileac crest apophysis
- 5 = complete ossification



# Assessment of Risk

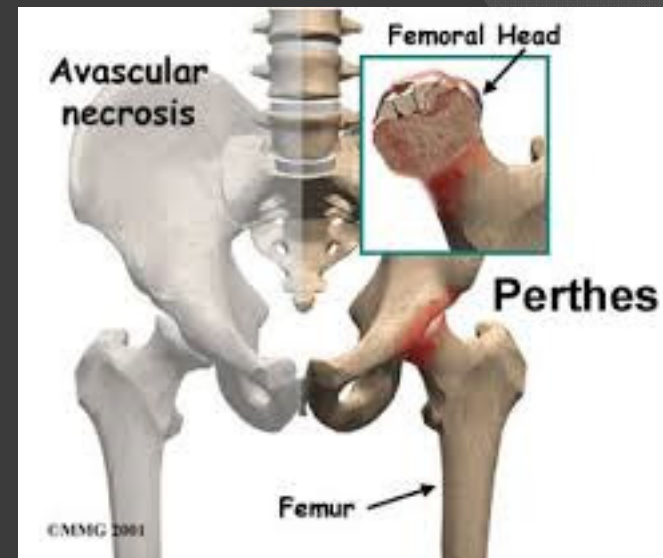
## Risk of Curve Progression

CURVE (DEGREE)	GROWTH POTENTIAL (RISSEI GRADE)	RISK*
10 to 19	Limited (2 to 4)	Low
10 to 19	High (0 to 1)	Moderate
20 to 29	Limited (2 to 4)	Low/moderate
20 to 29	High (0 to 1)	High
>29	Limited (2 to 4)	High
>29	High (0 to 1)	Very high

Remember this little kid



# Perthes' Disease



- Childhood hip disorder characterized by necrosis of the femoral head
- 1 in 10,000 kids
- Boys > Girls, 4:1
- Usually 4-8 years old
- Referral, observe, hopefully recover

# Back Pain

## 7 warning signs

- Less than 5 years old
- Duration >4 weeks
- Fever
- Night pain
- Postural shift or splinting
- Limitations in range of motion
- Neurologic abnormalities





# Orthopedic conditions

## No referral....usually

- In toeing
- Toe walking
- Transient synovitis of the hip



# In toeing

- ⦿ Most common question by parents by far
- ⦿ Normal, they will outgrow it
- ⦿ Tibial torsion
- ⦿ Metatarsas adductus
- ⦿ Femoral anteversion
- ⦿ Reassurance, no bracing

# Tibial torsion



Toe walking- no worries, they will outgrow it. “walk away from it”



# Transient Synovitis

- Acute, self limited, inflammation of the synovial lining. ??? Viral, traumatic
- Pain, stiffness and limp.
- Common, Male > Female
- 3-8 year old
- Occasional low grade fever
- CBC, CRP, ESR, Ultrasound



# Transient Synovitis vs. Acute Septic Arthritis

- Transient synovitis
  - severe pain = 11.5%
  - tenderness on palpation = 17.2%
  - T>38 degrees = 7.9%
  - ESR > 20 = 10.9%

## Septic Arthritis

- severe pain = 61.9%
- Tenderness on palpation = 85.7%
- T>38 degrees = 81%
- ESR > 20 = 90.5%

# Sports Medicine in Pediatric



# Children and young athletes

- Not the same as adults
- Thermoregulation  
immature systems  
do not control heat  
evaporation  
(30 minutes rule)
- Matching opponents





Someone could get hurt



# Female athletes

- ⦿ Eating disorders
- ⦿ Iron deficiency



# Classification of sports injuries

- ⦿ Direct injury- from **External Forces**
- ⦿ Indirect injury- from **Intrinsic Forces**
- ⦿ Overuse injury- from **Excessive and Repetitive Forces**



# Overuse injuries

- Osgood Schlatters disease
- Patellofemoral syndrome
- Costochondritis
- Sever's disease
- Stress fracture

# Overuse injuries

- Osgood Schlatters disease



# Overuse injuries

- Sever's Disease



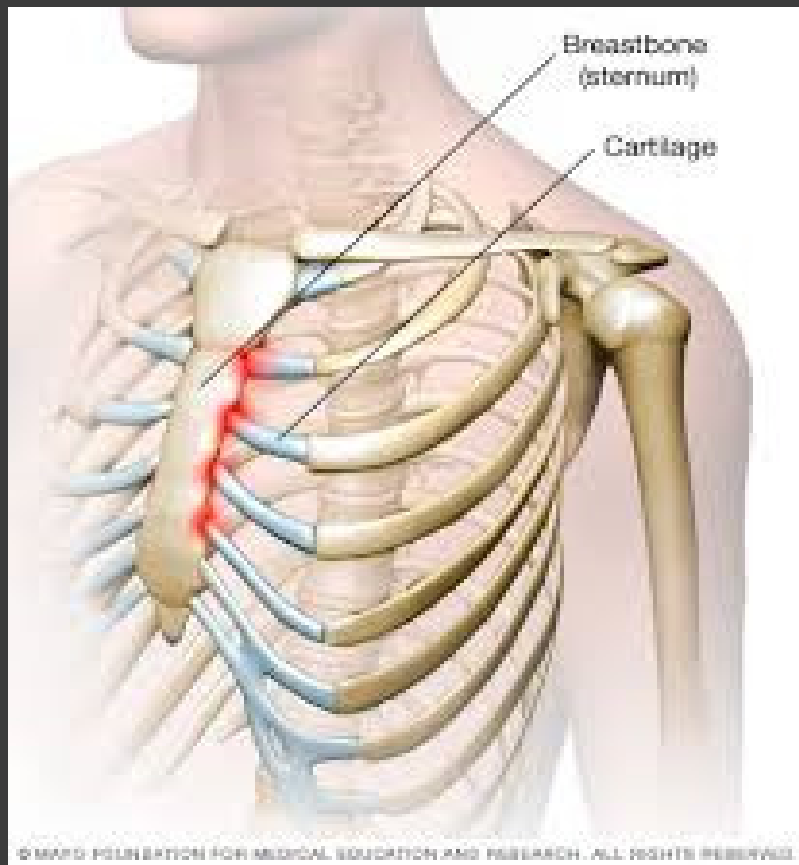
# Overuse injuries

- Patellofemoral syndrome



# Overuse injuries

- Costochondritis





# Soft Tissue injuries

- Strain = partial or complete tear of a muscle or tendon (bone to muscle)
- Sprain = partial or complete tear of a ligament (bone to bone)





# Traditional management

- ⦿ Rest
- ⦿ Ice
- ⦿ Ibuprofen
- ⦿ Compression
- ⦿ Elevation
- ⦿ Physical therapy

# For acute injury avoid :

- Heat
- Massage
- Activity



These things stimulate blood flow to the area of injury and increase swelling and inflammation, and increases healing time

# Alternative methods of management

- ① Chiropractic care
- ① Accupuncture
- ① Massage therapy
- ① Other

# Supplements to training

- Protein
- Creatine
- Others



# Sports concussion

where are we “headed”?



# Definition and Grading

- ① 27+ different grading systems in the literature
- ① No universal agreement with regards to injury definition and return to play guidelines
- ① Traumatic Brain Injury
- ① Do not have to have loss of consciousness



# Why such increased awareness

- Number of high profile cases in professional athletes
- Much more common in high school athletes because of the large number of participants
- Bigger and Faster Kids
- Noticing more long term effects



# Not just a football problem injury rate per 100,000 high school athletes

Football 47

Hockey 42

Girls soccer 36

Boys soccer 22

Girls basketball 21

Wrestling 18

Boys basketball 7



# Second Impact Syndrome

- ⦿ Repeat injury, while symptoms of first impact have not resolved
- ⦿ Cerebral edema still present
- ⦿ Axonal injury
- ⦿ Biochemical injury
- ⦿ Not due to bleeding
- ⦿ NFL and NCAA taking the lead
- ⦿ No return to play until symptom free (imPACT testing completed)

# Post-Concussive Syndrome

- 85-90% of concussed young athletes will recover within 1-2 weeks
- The remainder may have symptoms for months
- No need for imaging (MRI)
- Brain Rest is the treatment



# Chronic Traumatic Encephalopathy (CTE)

- Not just an adult condition
- Either way very serious
- Lifelong effects



Thank you

