

## PEDIATRIC ORTHOPEDIC AND SPORTS MEDICINE UPDATE

TODD TWOGOOD MD



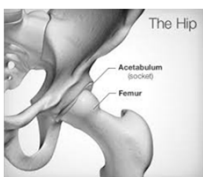
## ORTHOPEDIC



- 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

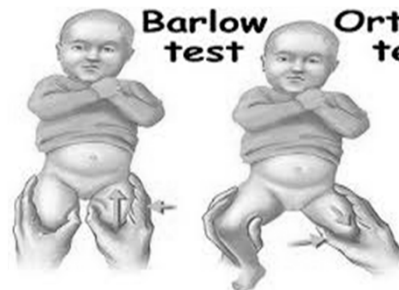


### Developmental Dysplasia of the Hip (DDH)

- 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

**Barlow test**      **Ortolani test**



### Treatment Pavlik Harness 2 months Ultrasound or X ray

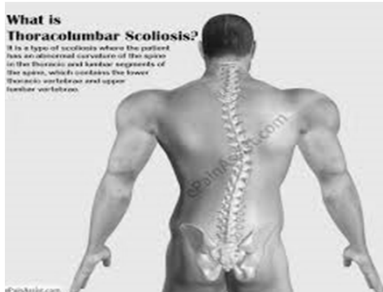


### Club Foot

- 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



### 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



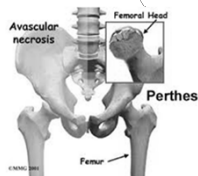
### Assessment of Risk

Risk of Curve Progression		
CURVE (DEGREE)	GROWTH POTENTIAL (RISSER 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



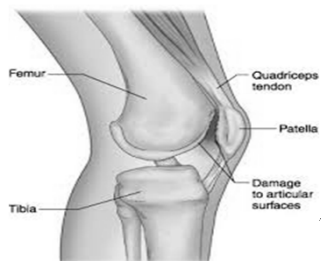
## Overuse injuries

- Sever's Disease



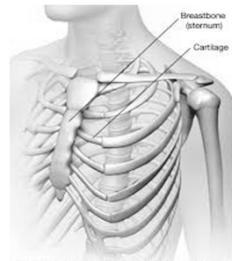
## Overuse injuries

- 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

- ⦿ Chiropractic care
- ⦿ Accupuncture
- ⦿ Massage therapy
- ⦿ Other

### Supplements to training

- ⦿ Protein
- ⦿ Creatine
- ⦿ Others



### Sports concussion

where are we "headed"?



### Definition and Grading

- ⦿ 27+ different grading systems in the literature
- ⦿ No universal agreement with regards to injury definition and return to play guidelines
- ⦿ Traumatic Brain Injury
- ⦿ 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

