

# Staying Out of Trouble in Pediatric Orthopaedics

Steve Gibbons, MD  
06/25/2021



UT Health  
San Antonio

# Outline

Elbow Fractures

Physeal Fractures

Tarsal Coalitions

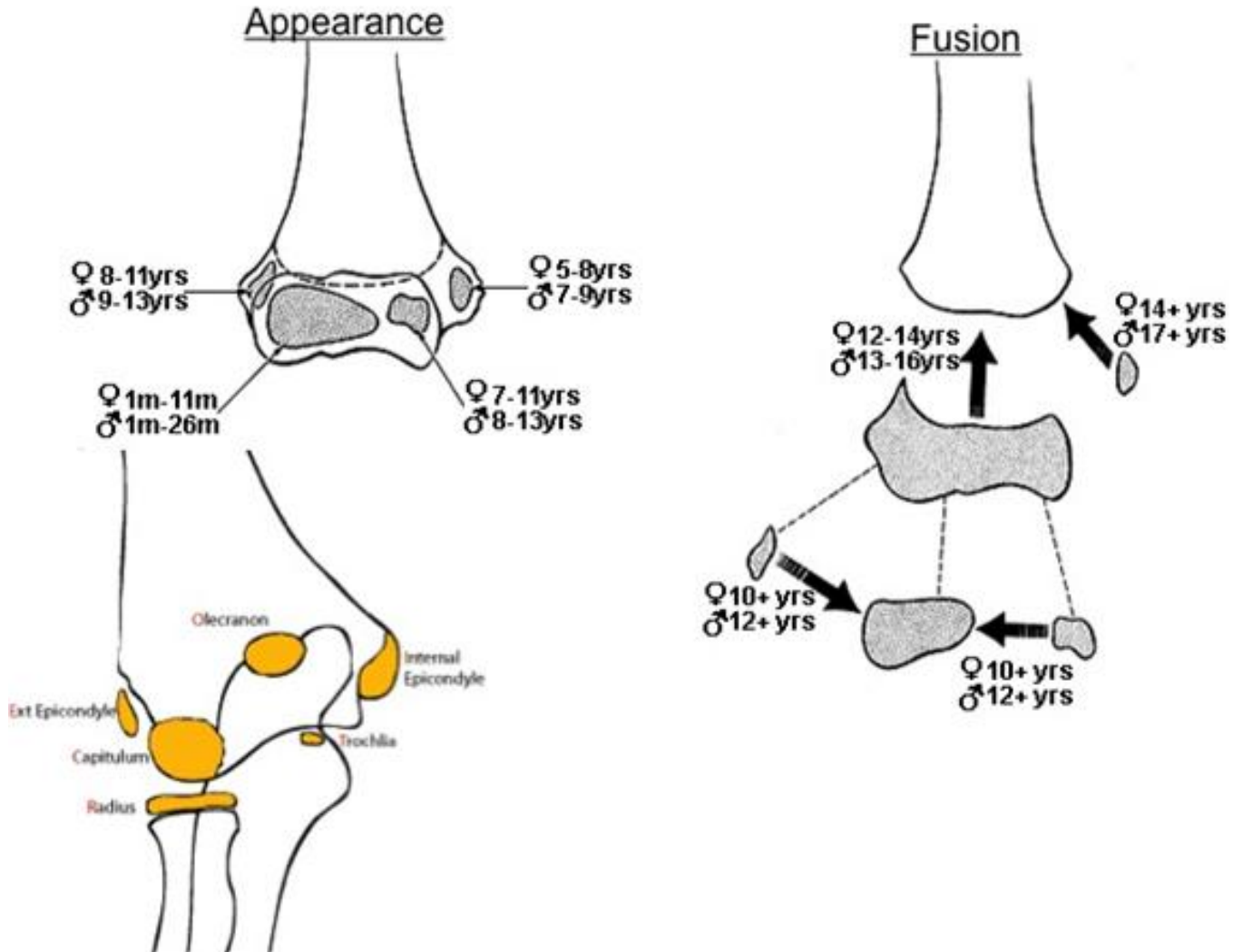
Femur Fractures

Non-accidental Trauma

SCFE

DDH

# The Elbow



# Supracondylar Humerus Fx

Common injury

Age <8yo

Often needs surgery

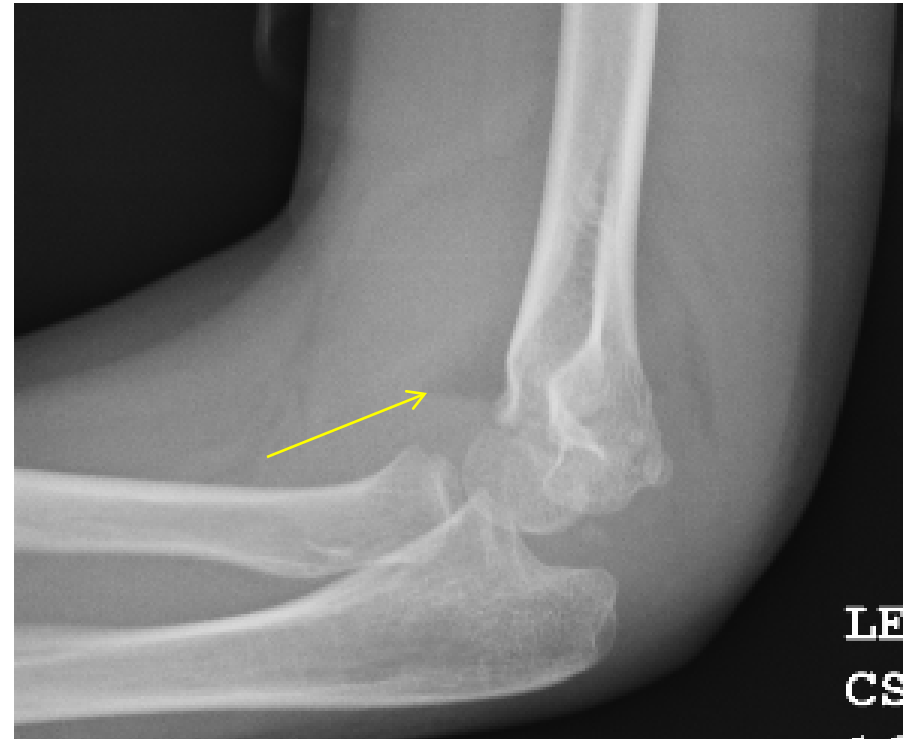
AIN palsy



# Supracondylar Humerus Fx

Look for fat pad sign

Look for anterior humeral line



# Medial Epicondyle Fractures

50% associated with elbow dislocation

Should try to reduce elbow

Can be treated op vs non-op



# Monteggia Fractures



# Monteggia Fractures

Closed reduction and casting

Closed reduction, IMN

Open reduction and plating





# Lateral Condyle Fractures

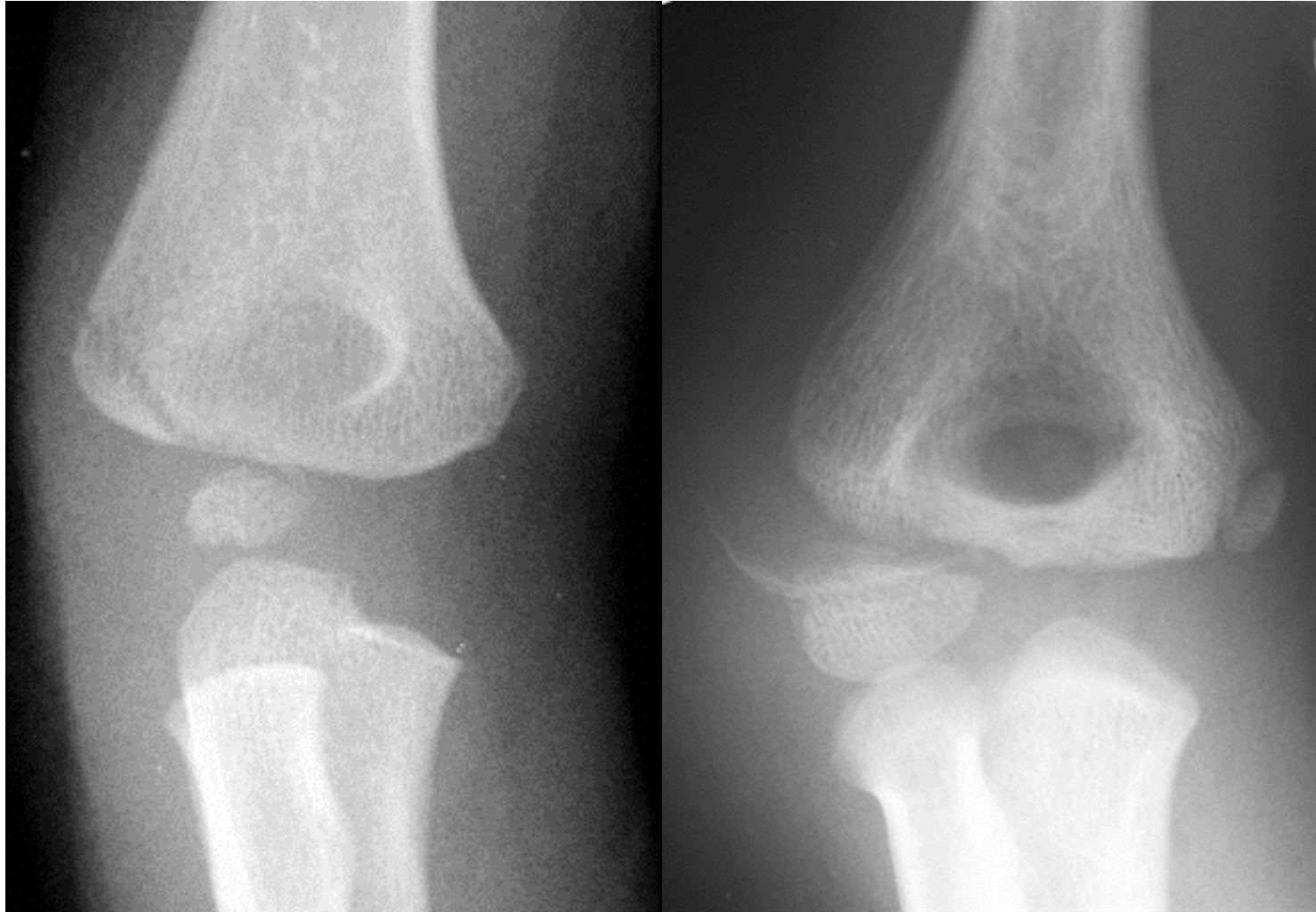
2<sup>nd</sup> Most common elbow fracture

Most need operative fixation

CRPP vs Open



# Lateral Condyle Fractures



# Physeal Fractures

Salter Harris 1-5

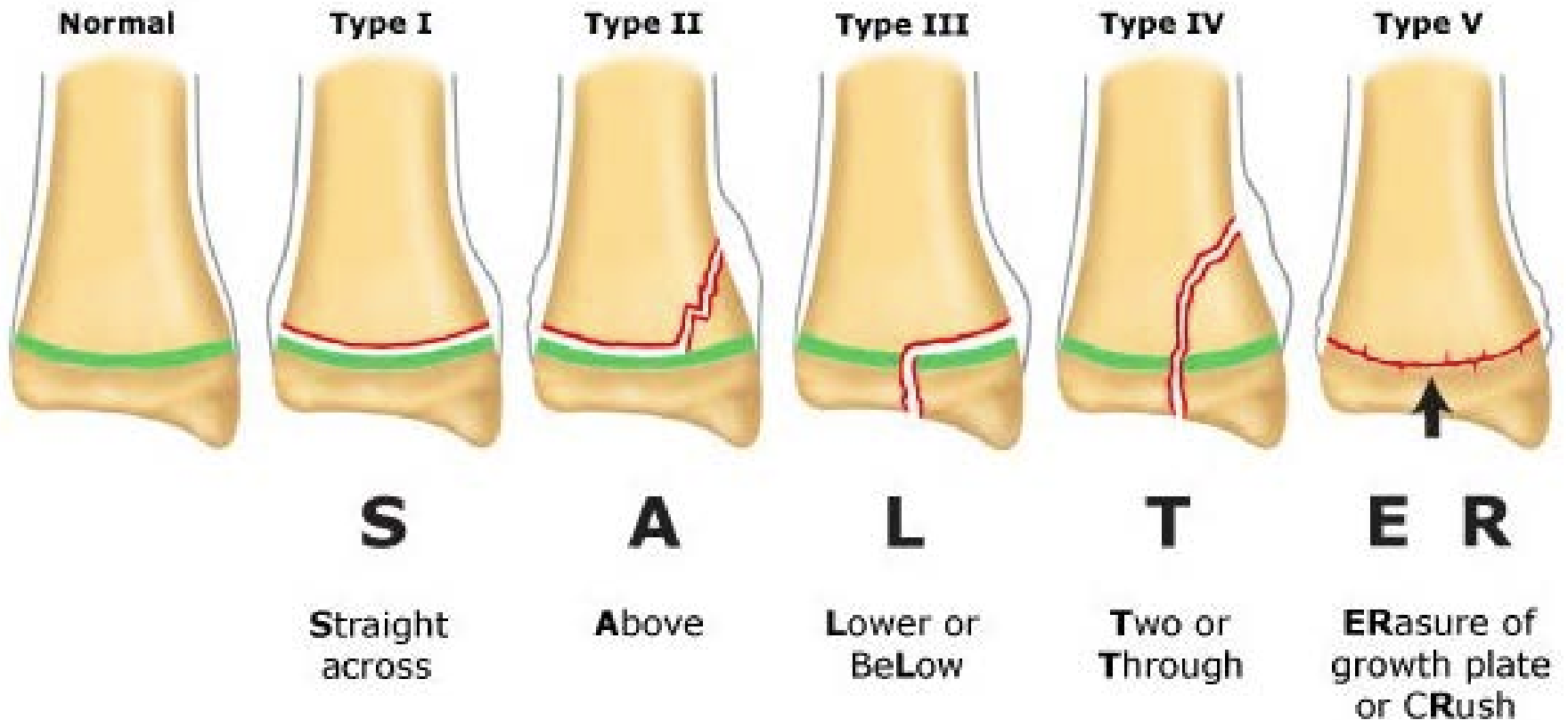
↑Growth arrest 1-5

↑Remodeling potential at active physes

Most can close reduce +/- hardware



# Physeal Fractures



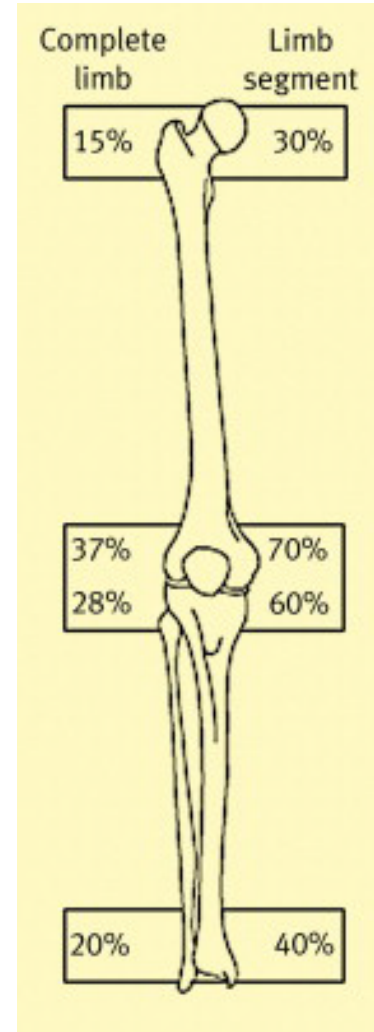
# Lower Extremity Physeal Growth

Proximal femur - 3 mm / yr

Distal femur - 10 mm / yr

Proximal tibia - 6 mm / yr

Distal tibia - 3 mm / yr



# Upper Extremity Physeal Growth

Humerus

80% Proximal



Forearm

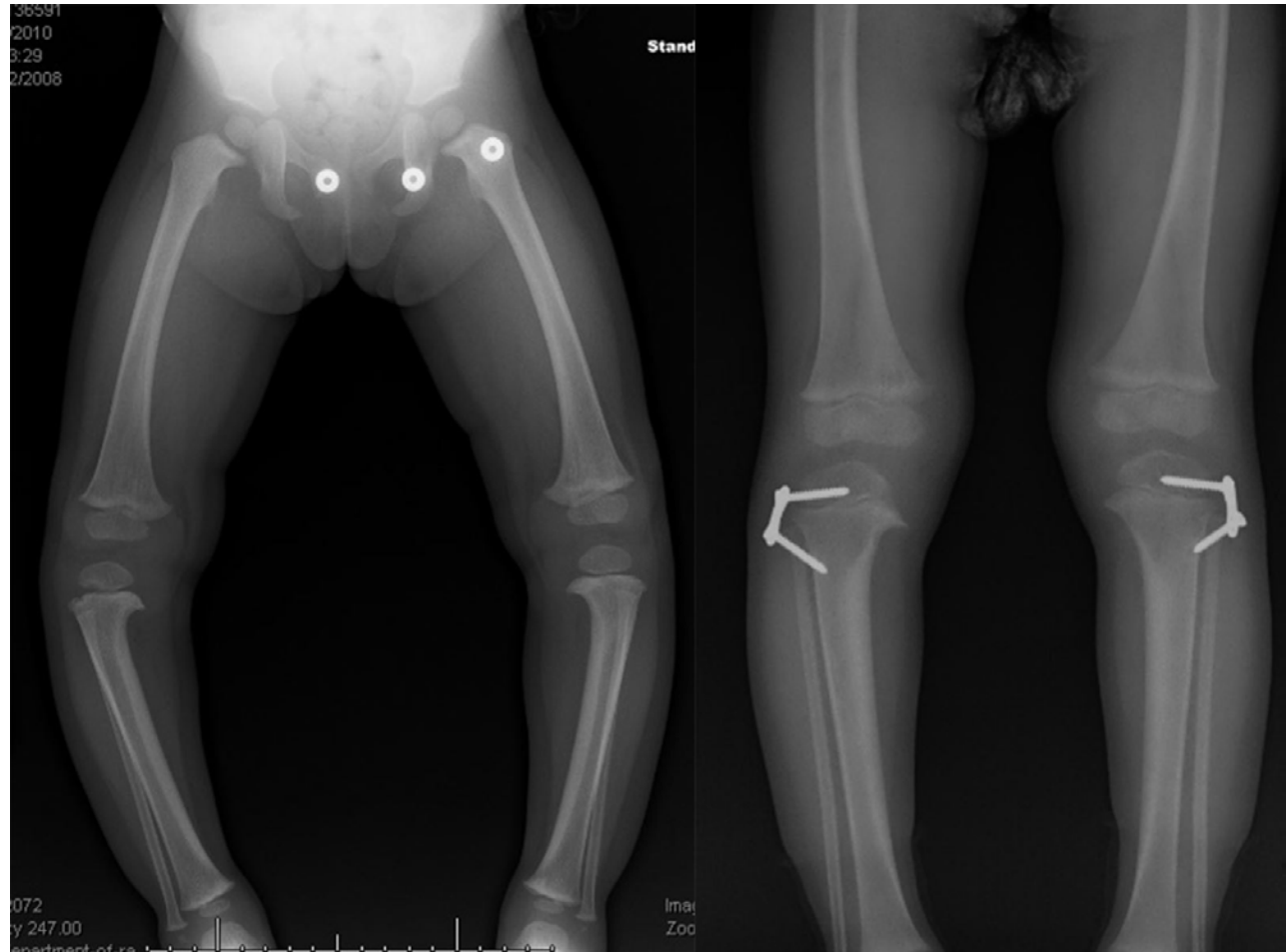
80% Distal



# Age at skeletal maturity

Girls – 14

Boys – 16



# Tarsal Coalition

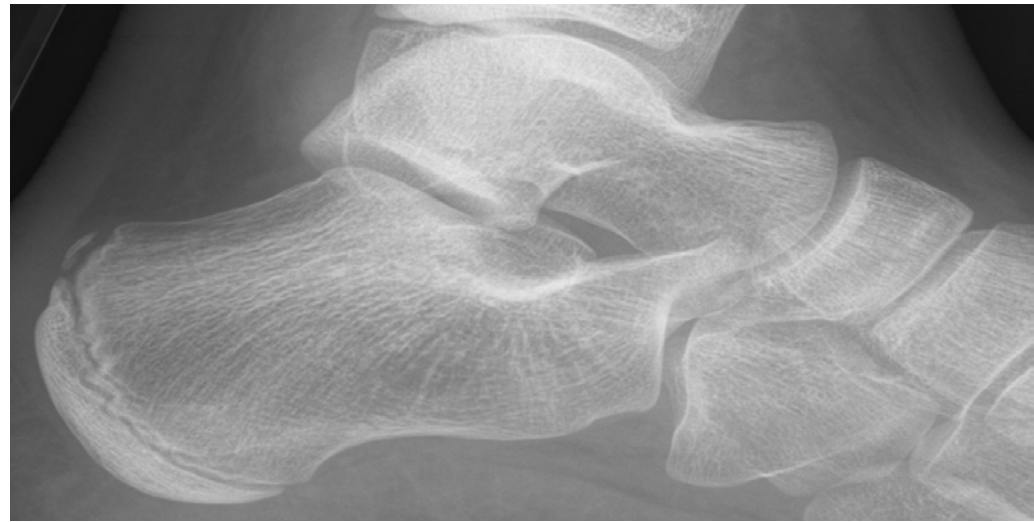
Most common coalitions:

Calcaneonavicular

Talocalcaneal

Prevalence 1-6%

Bilateral up to 60%





# Tarsal Coalition

## Symptoms

Anterior/lateral foot/ankle pain

pain worsened by activity

**recurrent ankle sprains**

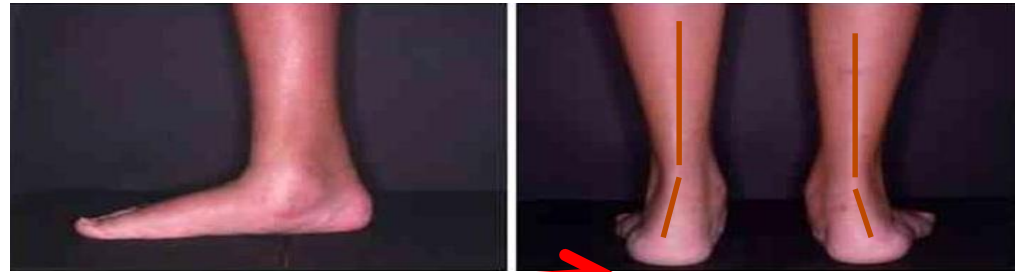


# Tarsal Coalition

## Physical Exam

### Inspection

hindfoot valgus

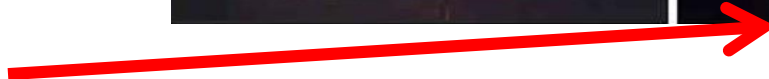
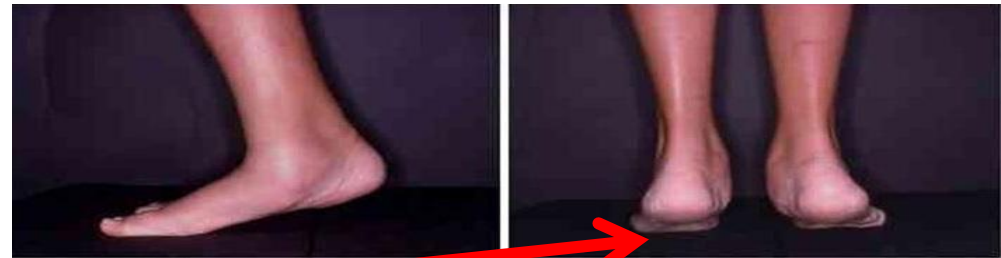


### Range of motion

limited subtalar motion

heel cord contractures

arch of foot may not reconstitute upon toe-standing

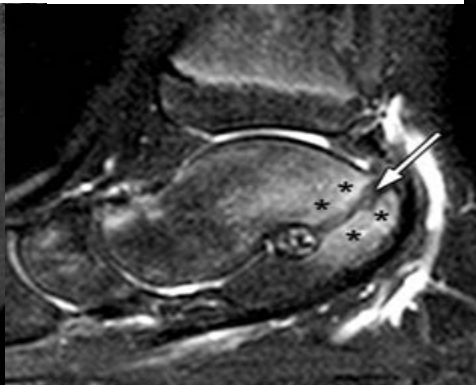
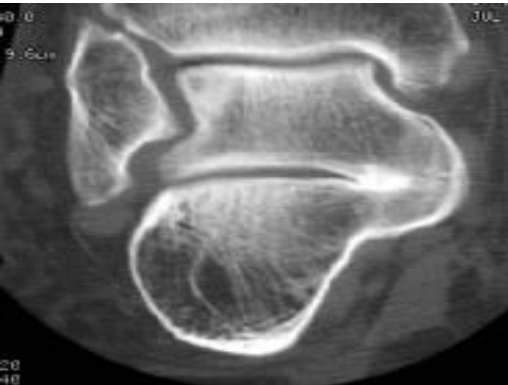


# Tarsal Coalition

## Imaging

AP, Lat, Oblique, Harris

CT or MRI



# Tarsal Coalition

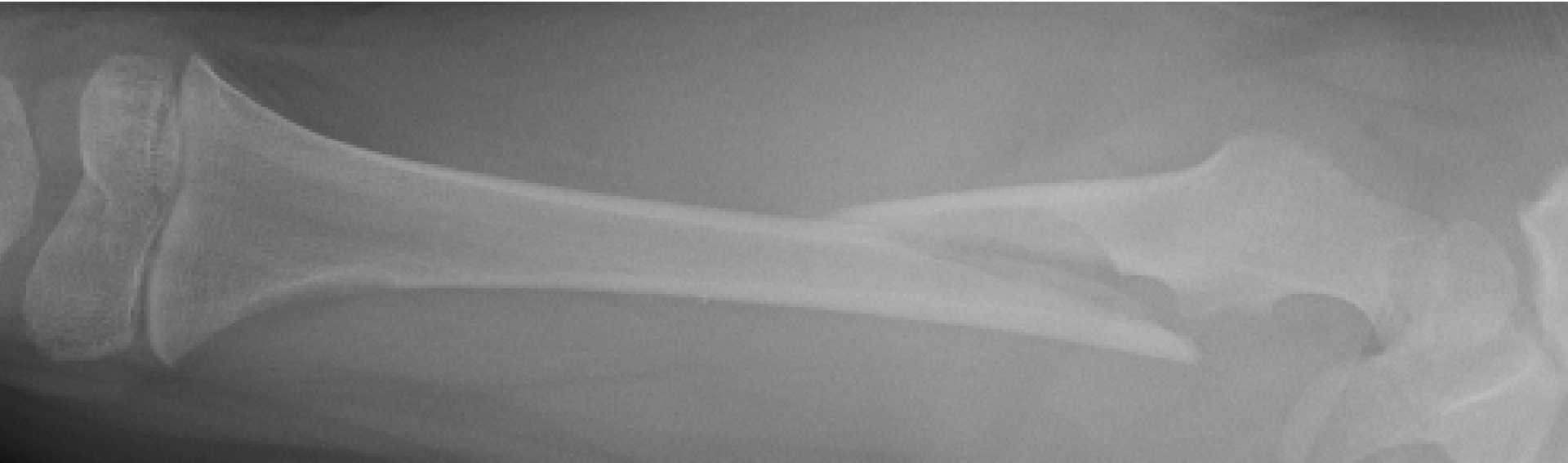
Activity modification, casting,  
orthotics

Resection and fat/EDB  
interposition

Triple arthrodesis  
Failed resection  
Extensive coalition



# Femur Fractures



<6mo – Pavlik



# 6mo-6 yr – Spica Cast





## 6-11yr – Plate vs Flex Nail





## 6-11yr – Plate vs Flex Nail



>12yr IMN



# Non-accidental Trauma

## Risk Factors

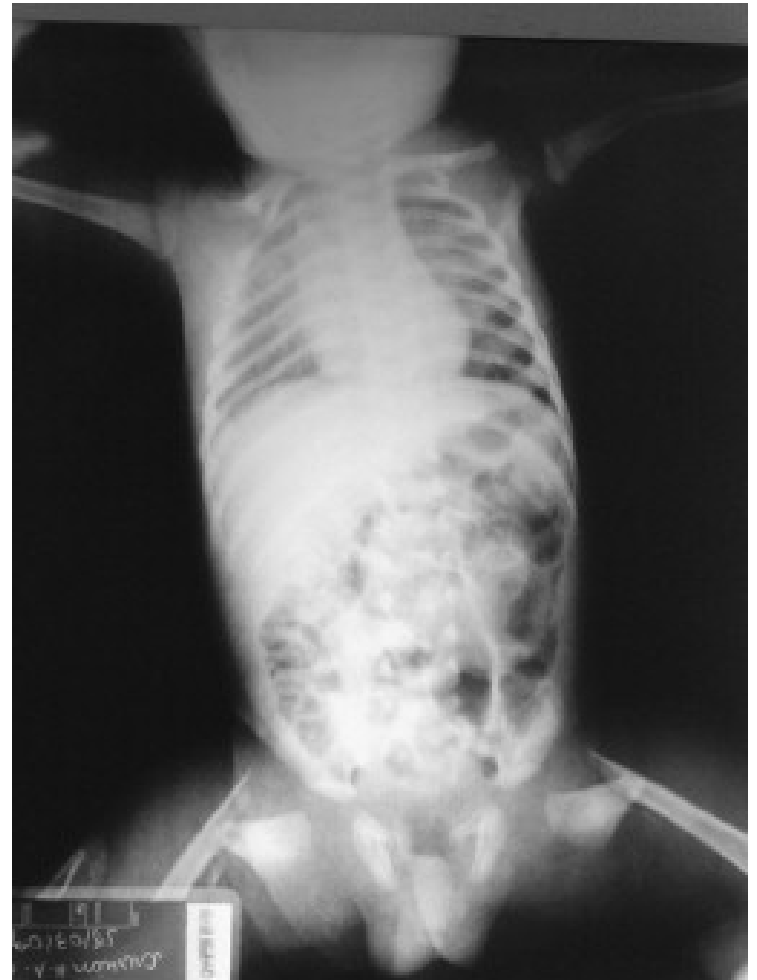
1<sup>st</sup> born

Unplanned

Premature

Disabilities/CP

Step-child



# Non-accidental Trauma

## Risk Factors

- single-parent home
- recent social stressor  
(move, job loss)
- unemployment
- drug-use
- personal history of abuse  
as a child
- lower socioeconomic  
status
- lack of support system



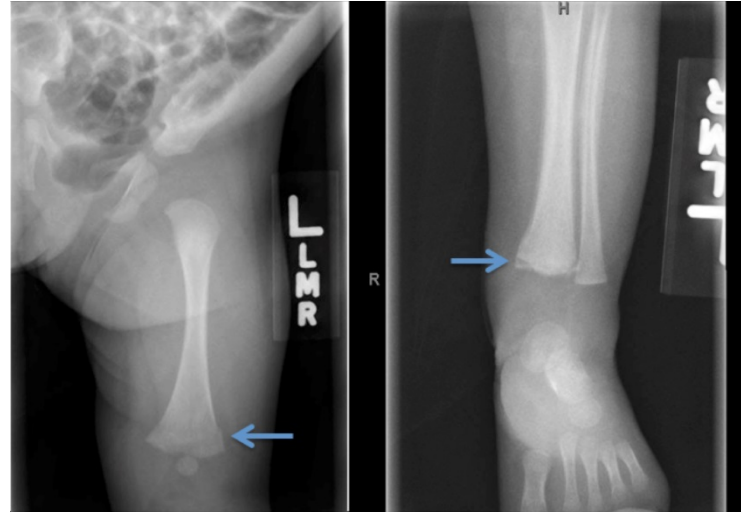
# Non-accidental Trauma

Femur fracture <1yr

Corner Fracture

Metaphyseal junction

Distal Humerus physeal fracture



# Non-accidental Trauma

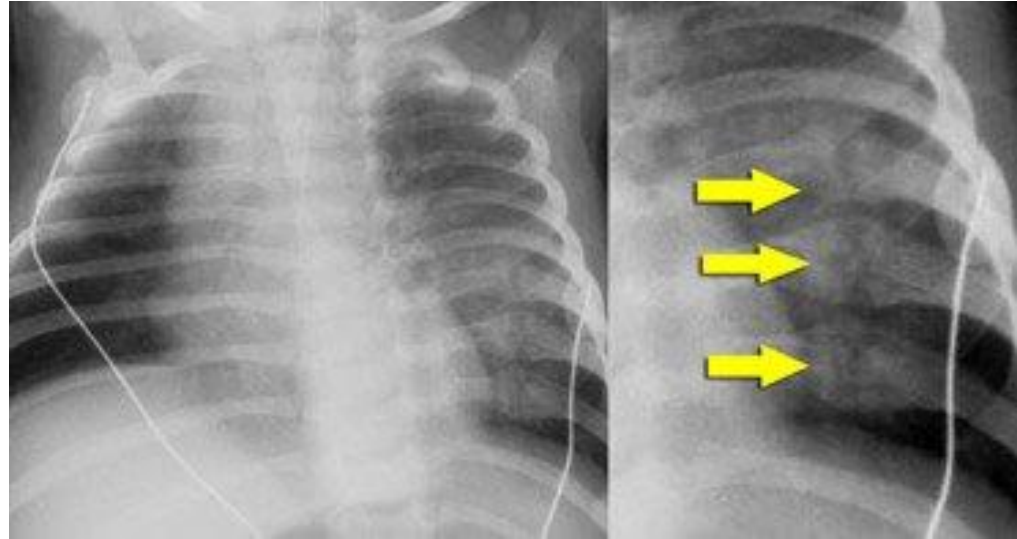
## Report

Unreported – 50% repeat abuse, 5-10% death

## Admit

Social Worker  
Skeletal Survey

## Treat



# SCFE

Male

Obese

12-14 yo

KNEE PAIN



# SCFE

KNE

Growth plate

Femoral head

12-1

Femur

BL?

Growth plate

SCFE

Femur





# SCFE

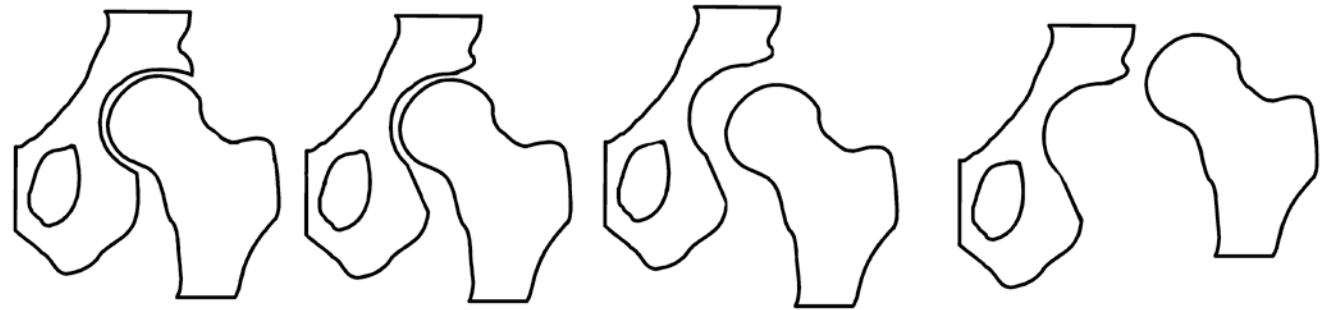


# DDH Terminology

Dysplasia – shallow or underdeveloped acetabulum

Subluxation

Dislocation



Teratologic hip

Dislocated in utero and irreducible

# Etiology

First born

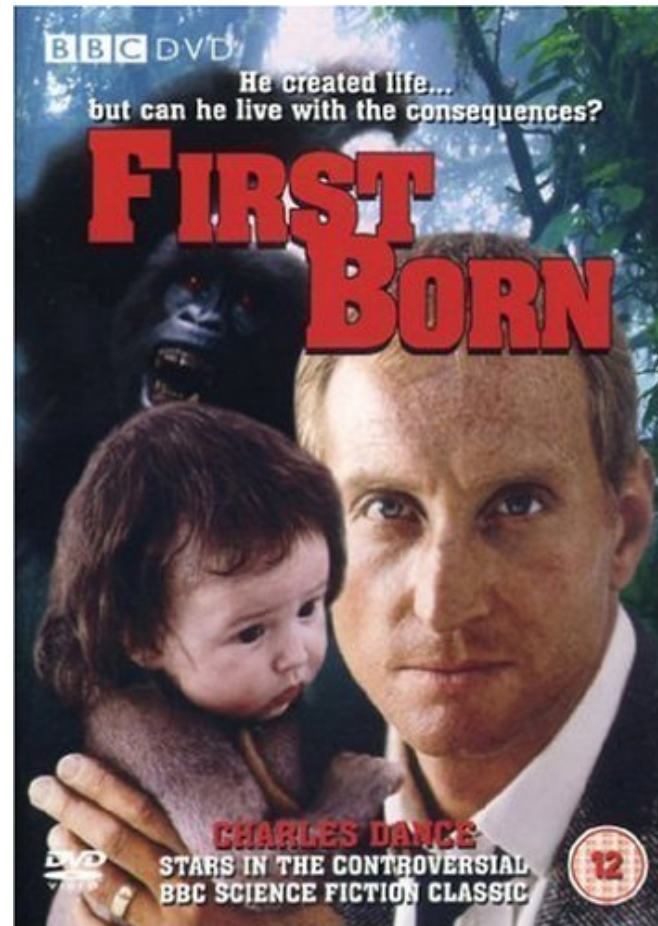
Tighter space

Female – 80%

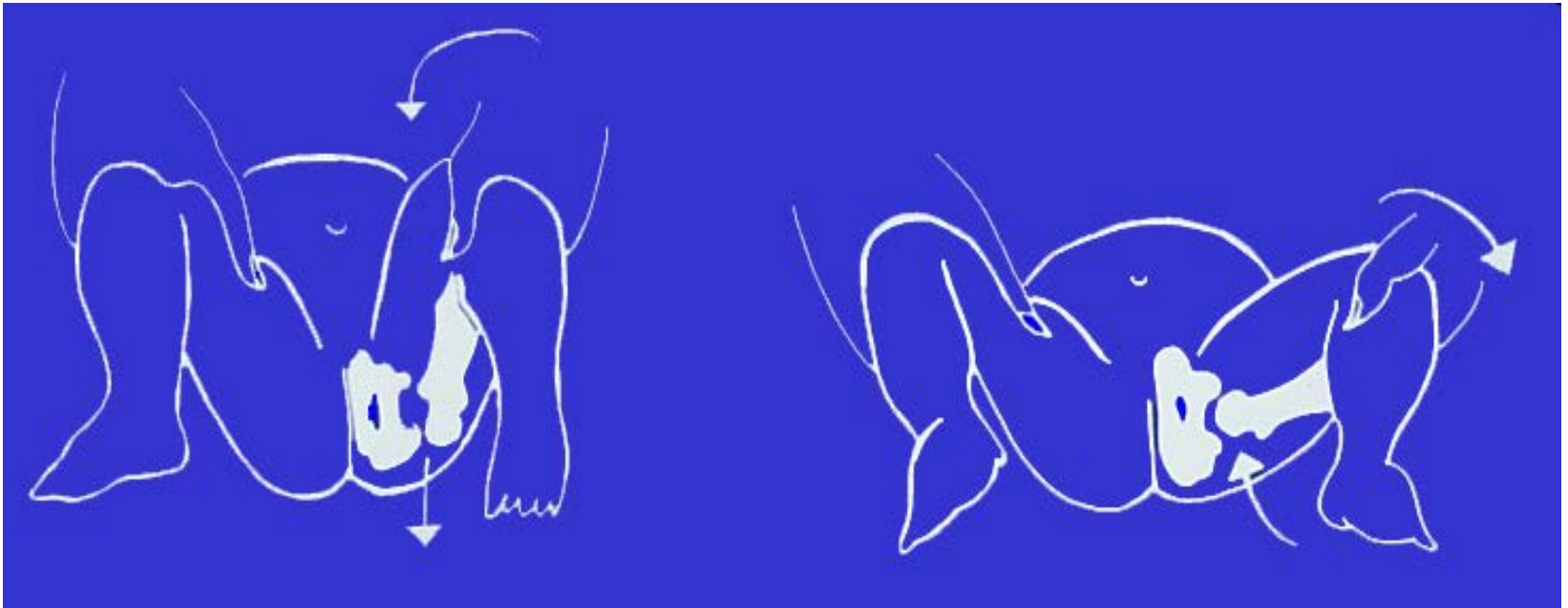
Family History

+12-33%

Breech



# Exam Maneuvers



Barlow = Dislocatable

Ortolani = Reducible

# Galeazzi



# Klasic



# Late Diagnosis

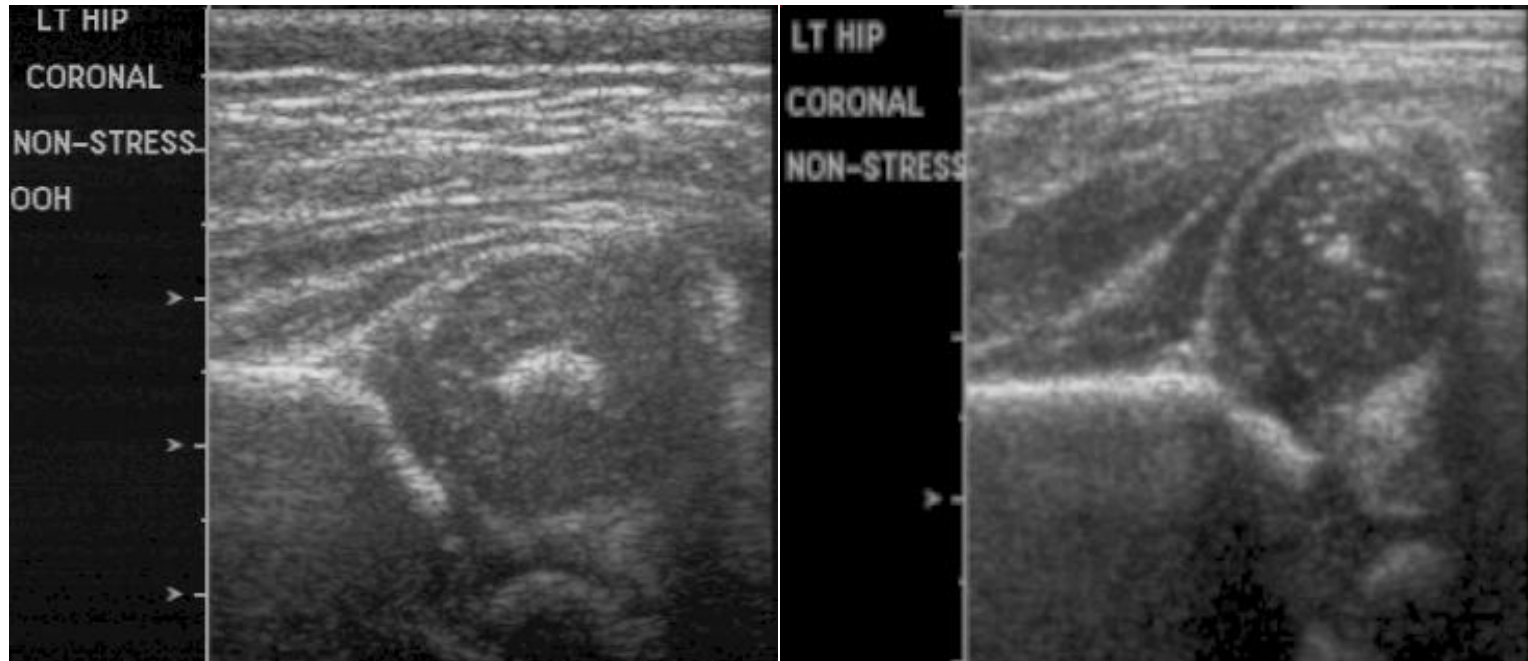




# Imaging

## US

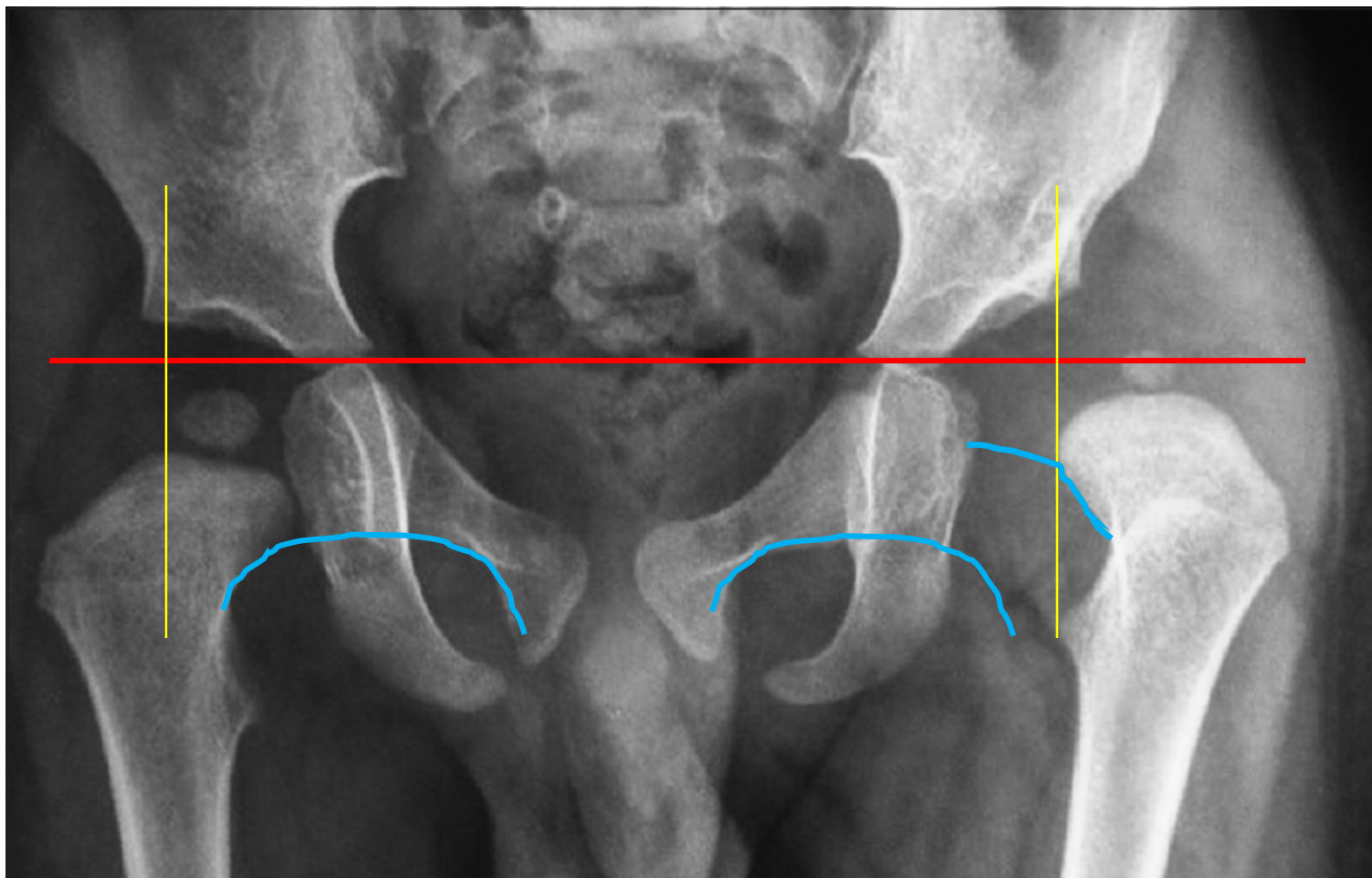
Alpha angle  
% coverage





# Imaging

AP



# Treatment <6mo



Arnold Pavlik

Pavlik Harness

Confirm w/ US

D/c after 3wks if not reduced

Tx – at least 6 weeks after normal  
US/Exam



# Treatment 6-18mo

Closed vs Open Reduction

EUA with arthrogram

Change cast at 6wks

