Current status of Bowlegs and knock knees in children

Freih Odeh Abu Hassan

F.R.C.S.(Eng.), F.R.C.S.(Tr.& Orth.)

Professor of Orthopedics

The University of Jordan

Bowlegs

Knock knees

1= Commonest L.L problems in daily practice.

2= Unnecessary Orthosis

3= Great concern to parents.

4= Most apparent at the start of walking >10m

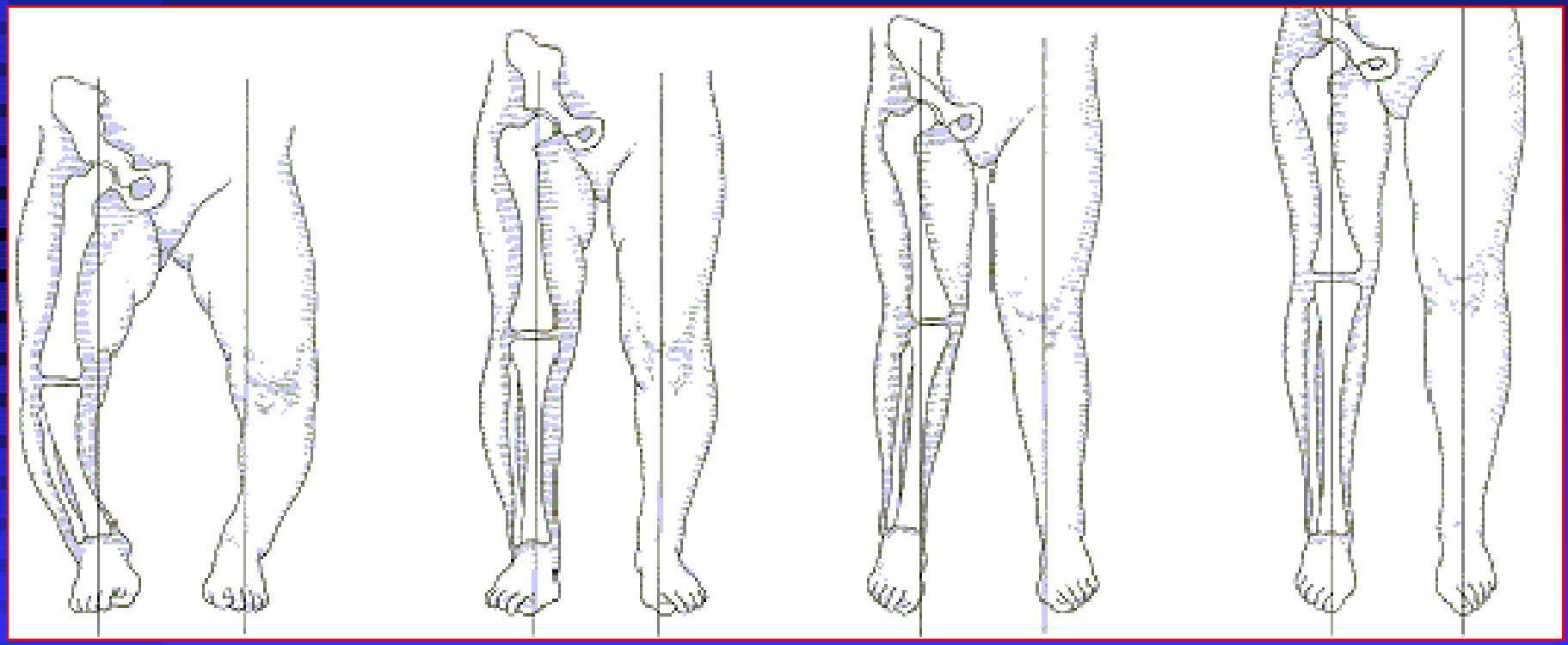
5= The physician must be able to diff. between those def. which resolve spontaneously & those will not.

The normal evolution of leg shape

All normal infants are born with bow-legs

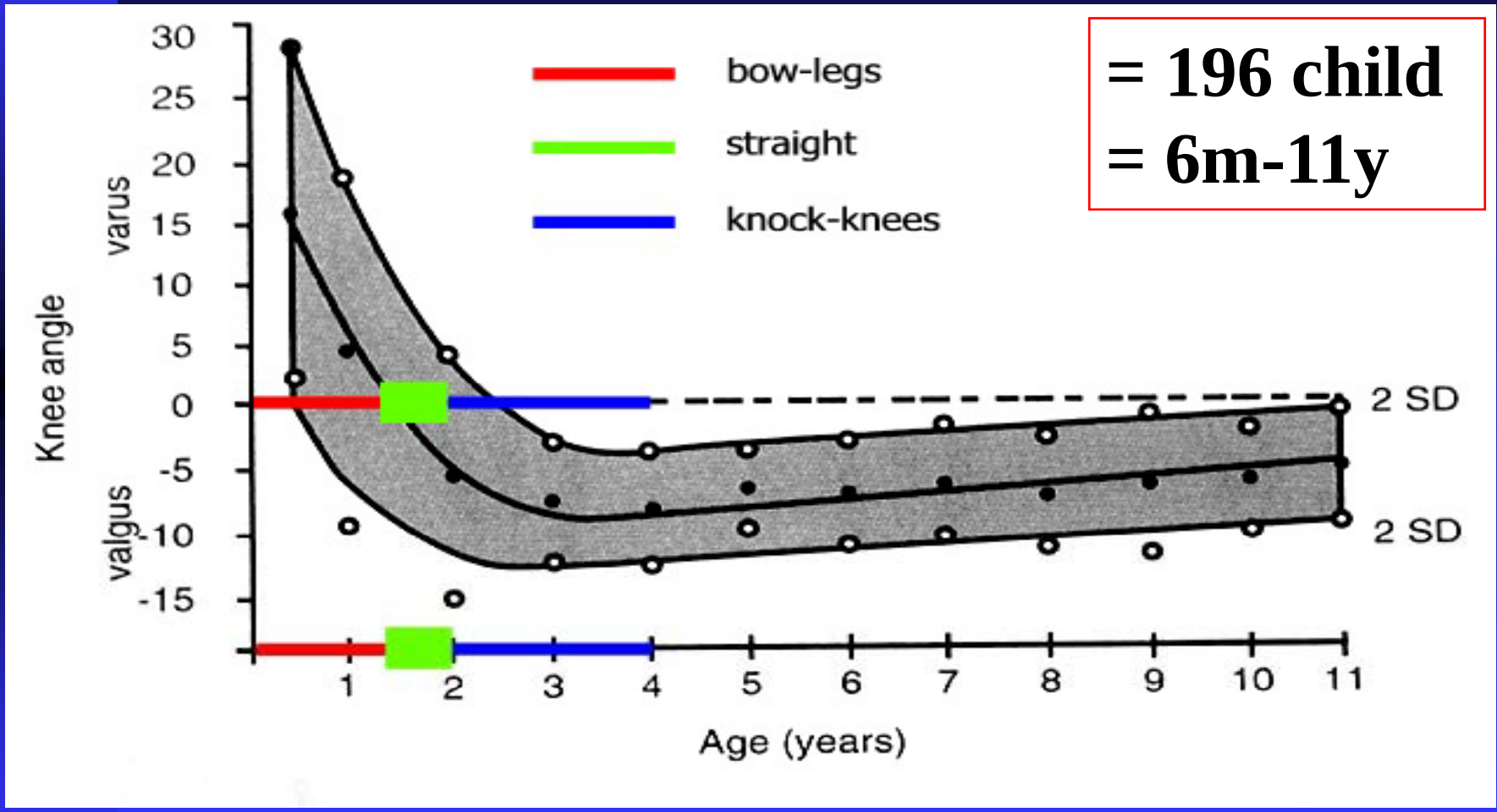
Development of knee alignment

<1.5y	1.5-3y	3-6y	7-9y

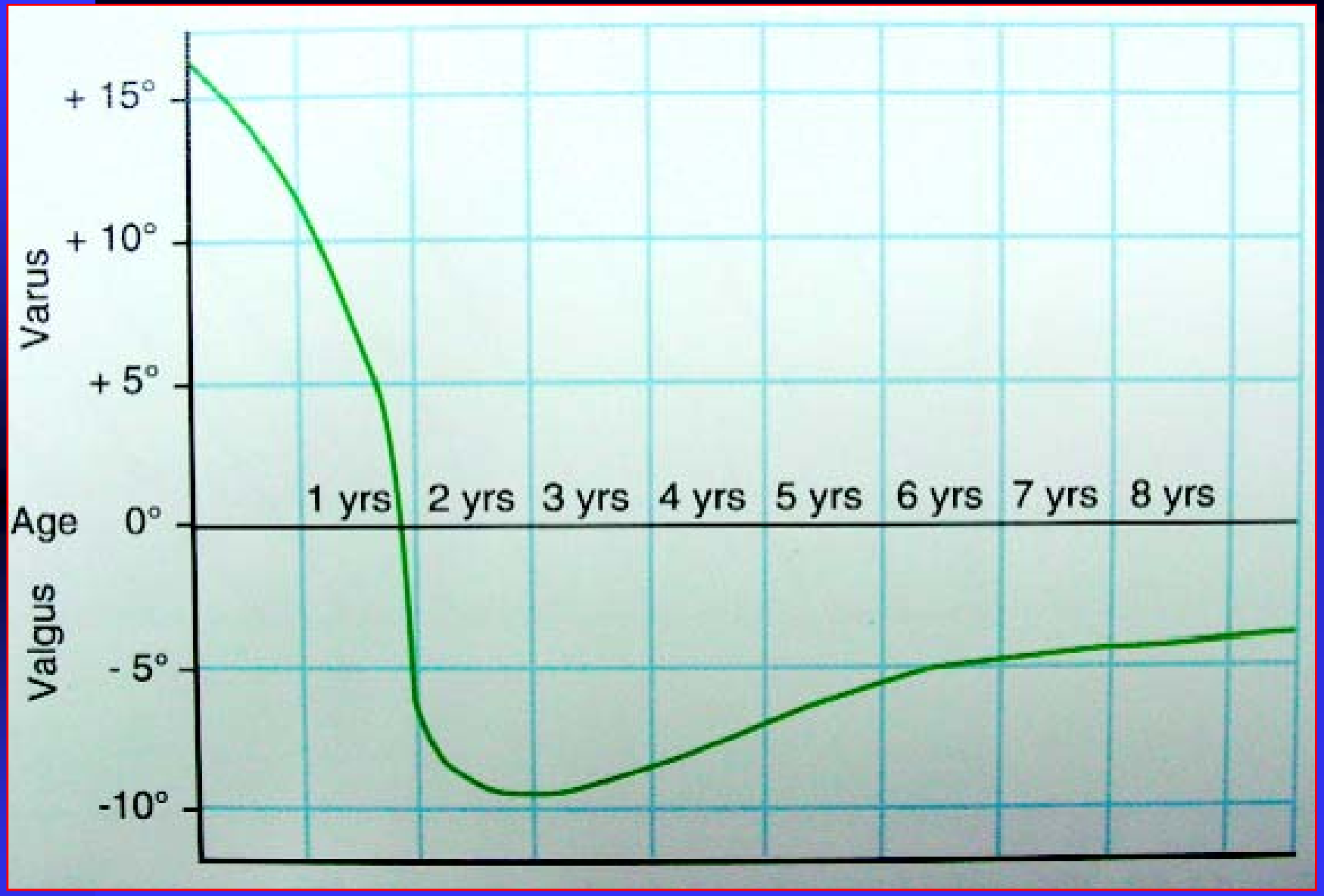


10-15 deg. Varus	0 deg.	10-12 deg. Valgus	5-6 deg. Valgus

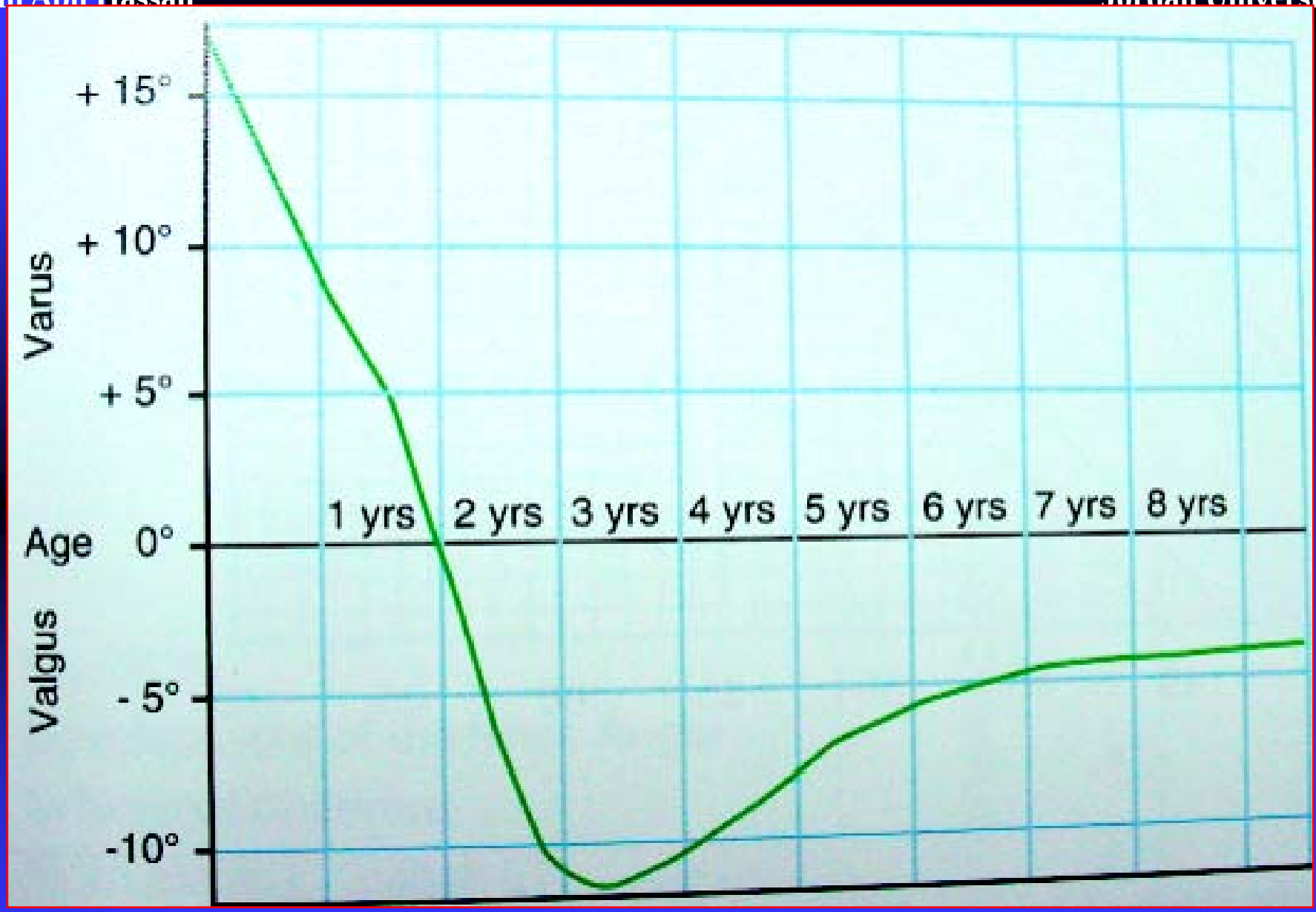
Development of knee angle in normal children



Heath, Staheli :JPO 1993

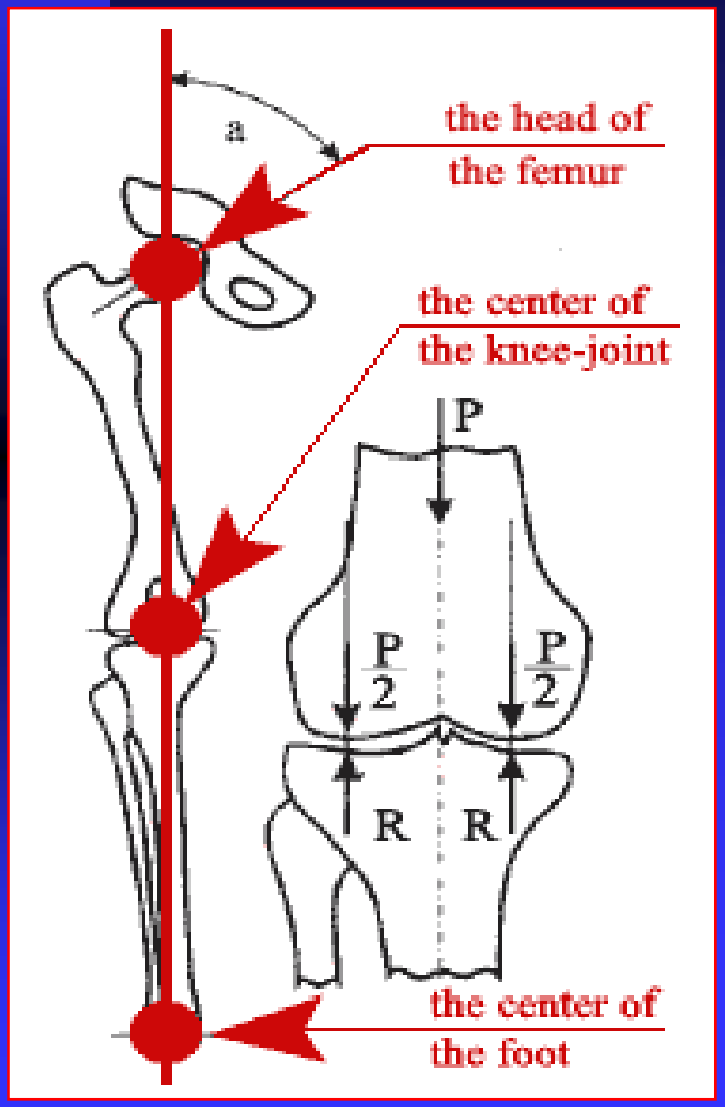


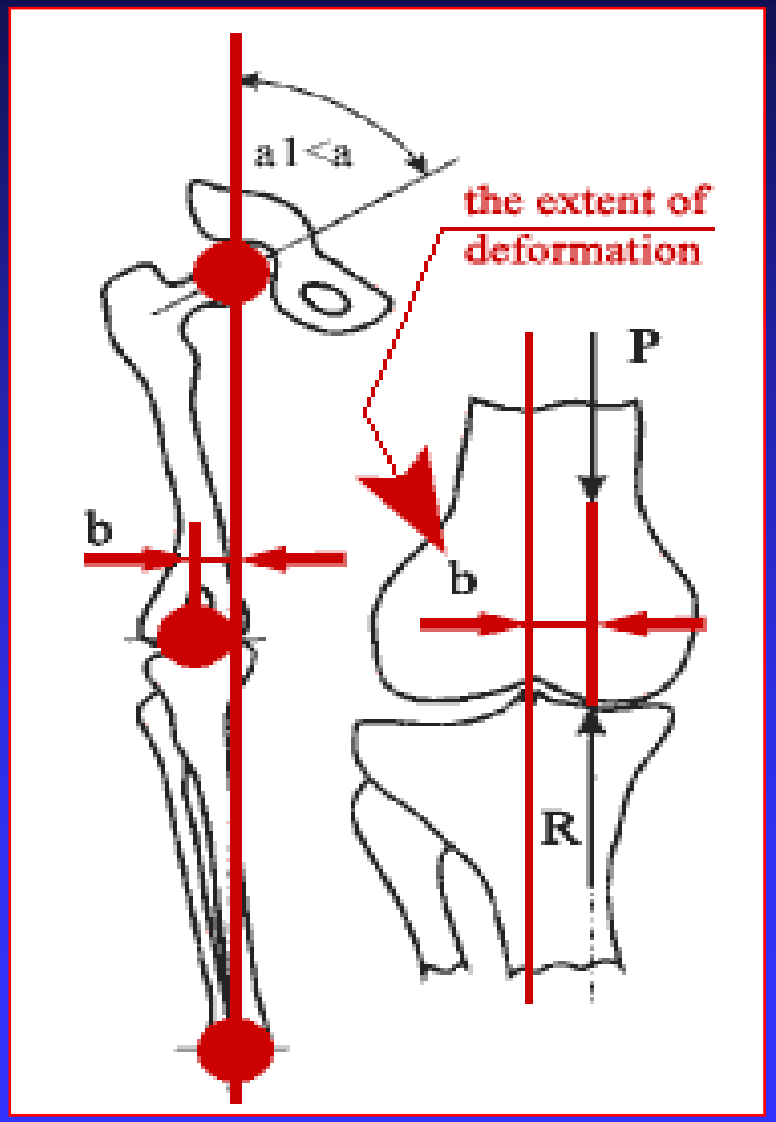
Tibiofemoral angle in Girls, Salenius P, 1977, JBJS-A



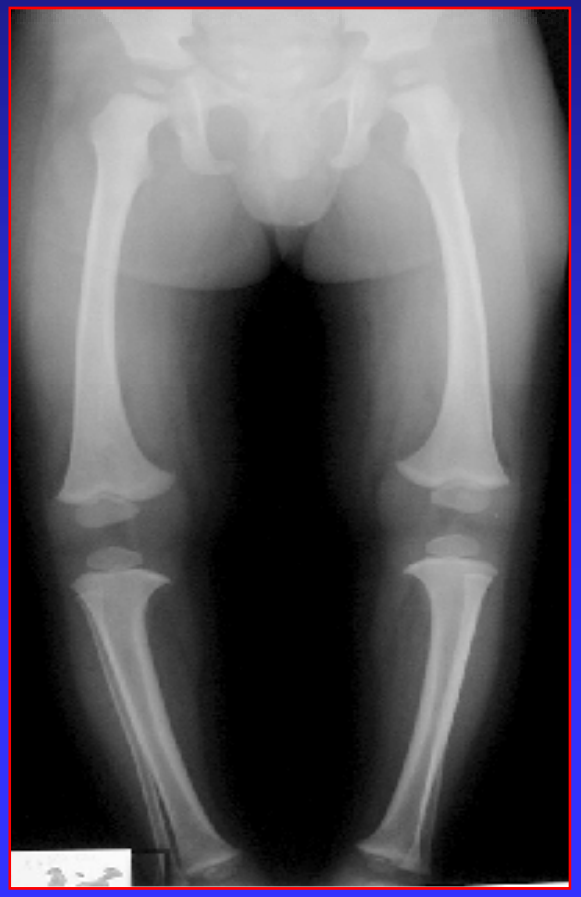
Tibiofemoral angle in Boys, Salenius P, 1977, JBJS-A

Pathomechanics





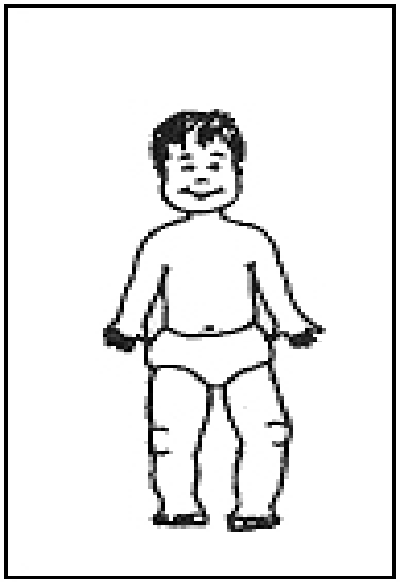
Ext. femoral torsion + I Tibial T → Lat. Deviation of the Knee axis → Lat.thrust on the knee →Bowing



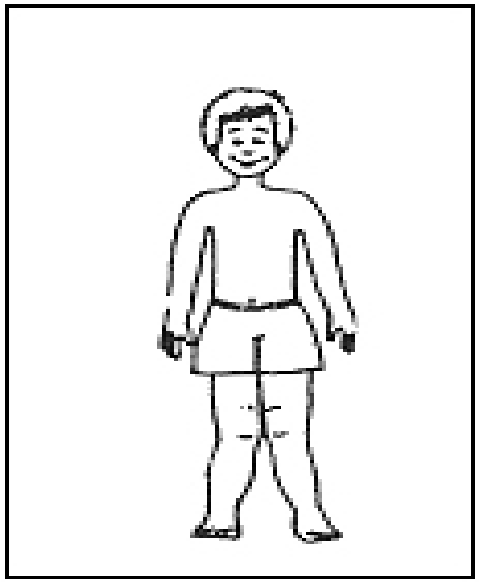
How bowing change to valgus ?

Pelvic widening

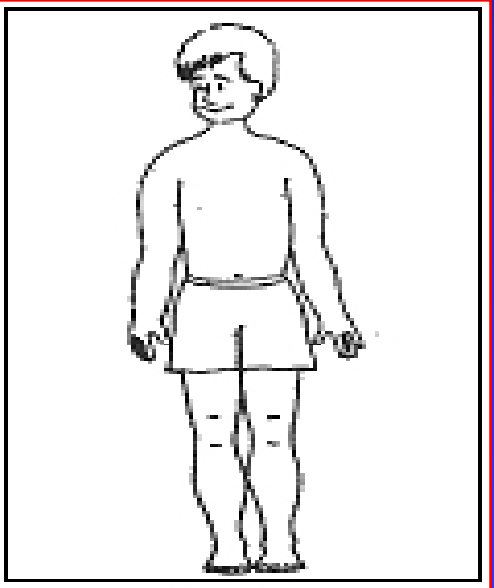
Pelvic growth gets out of step with the Growth of the femur → knock knees



Bowlegs



Knock-Knees



Normal

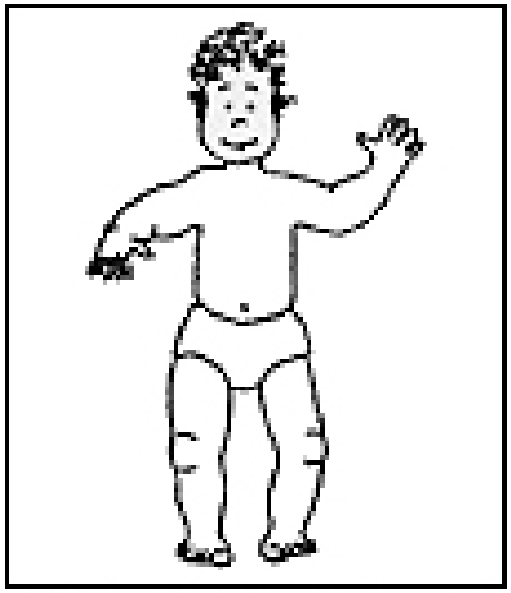
Forms of bowlegs

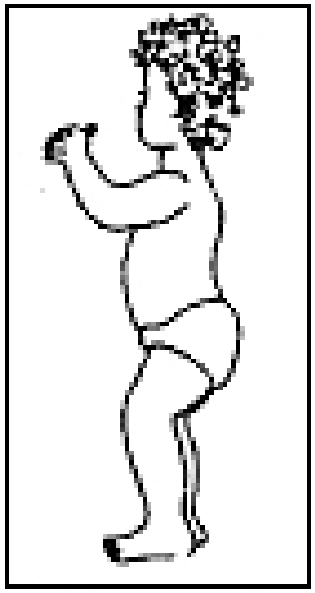
A- Physiological

1. Distal femoral angulation
2. Px tibial angulation.
3. Apparent than real (Flexed knee).
4. Distal tibia bowing :

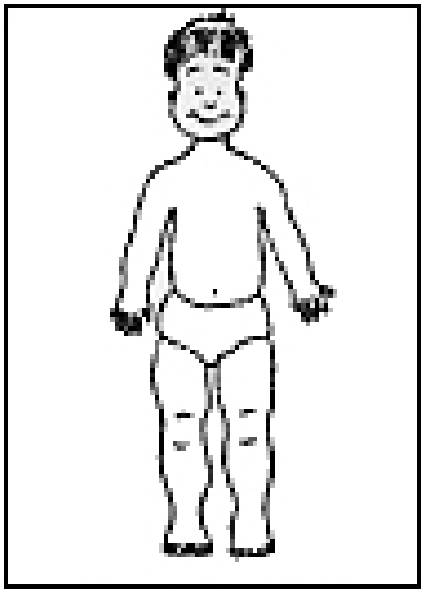
B- Pathological.

Apparent than real (Flexed knee).





Apparent bowleg occurs when the child stands with hips and knees flexed.



When the child lies down and extends the hips and knees, the legs are straight.

Child with ITT stands with the knee flexed

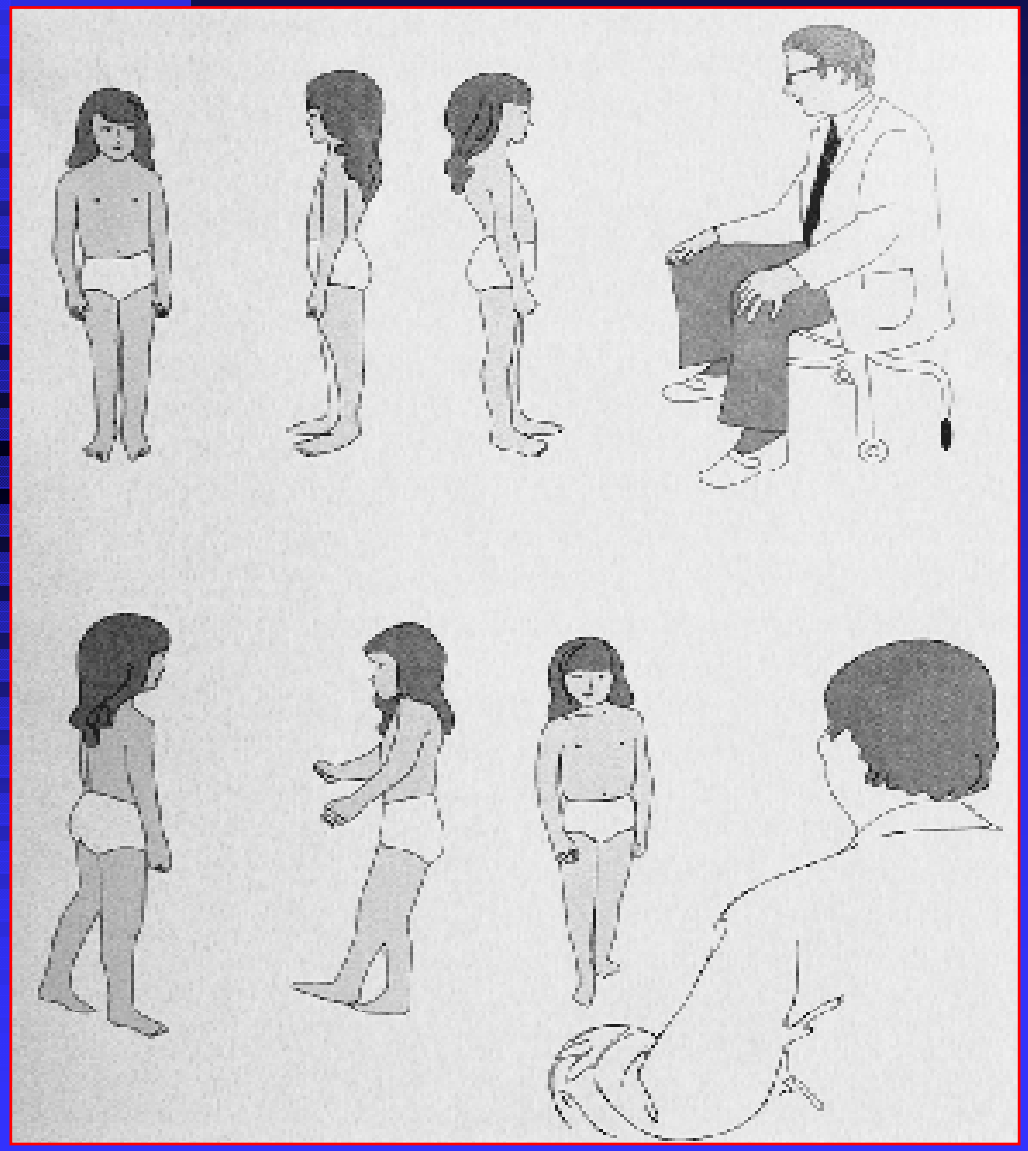
How you should approach such cases ?

Your systemic approach

Take the family concern seriously !!!!

Listen to the parents

Careful history & examination



History

= +ve FH

= Diet

= Sun Exposure

= Short stature

= Asymmetry

= Out of sequence

= Severe

Measure the ICD / IMD

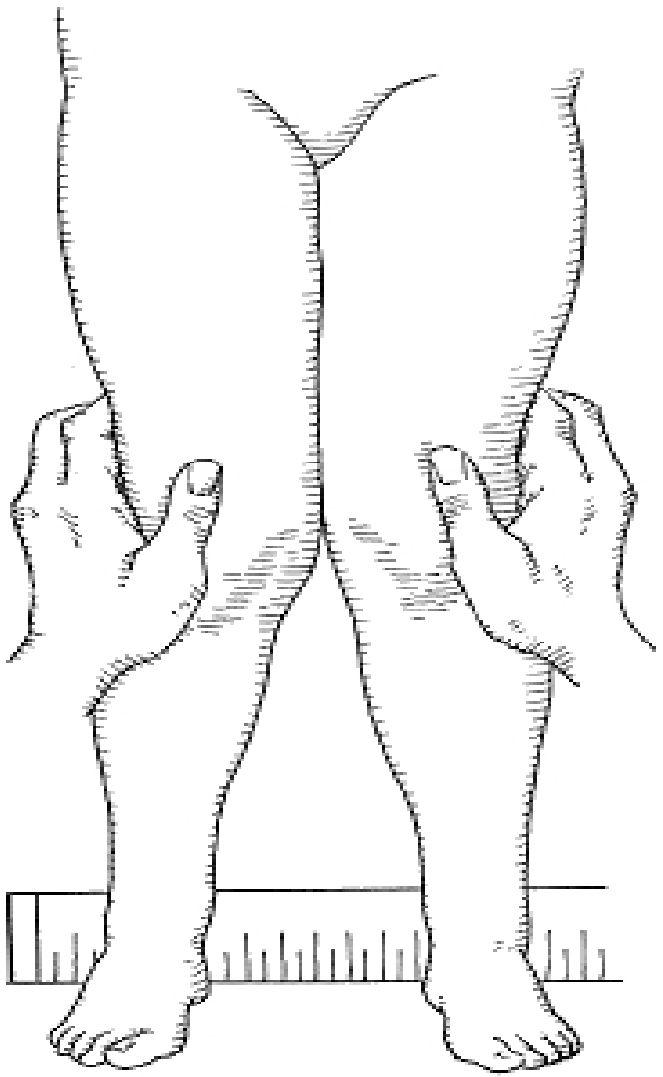


FIGURE 2 – clinical measurement of genu valgum.

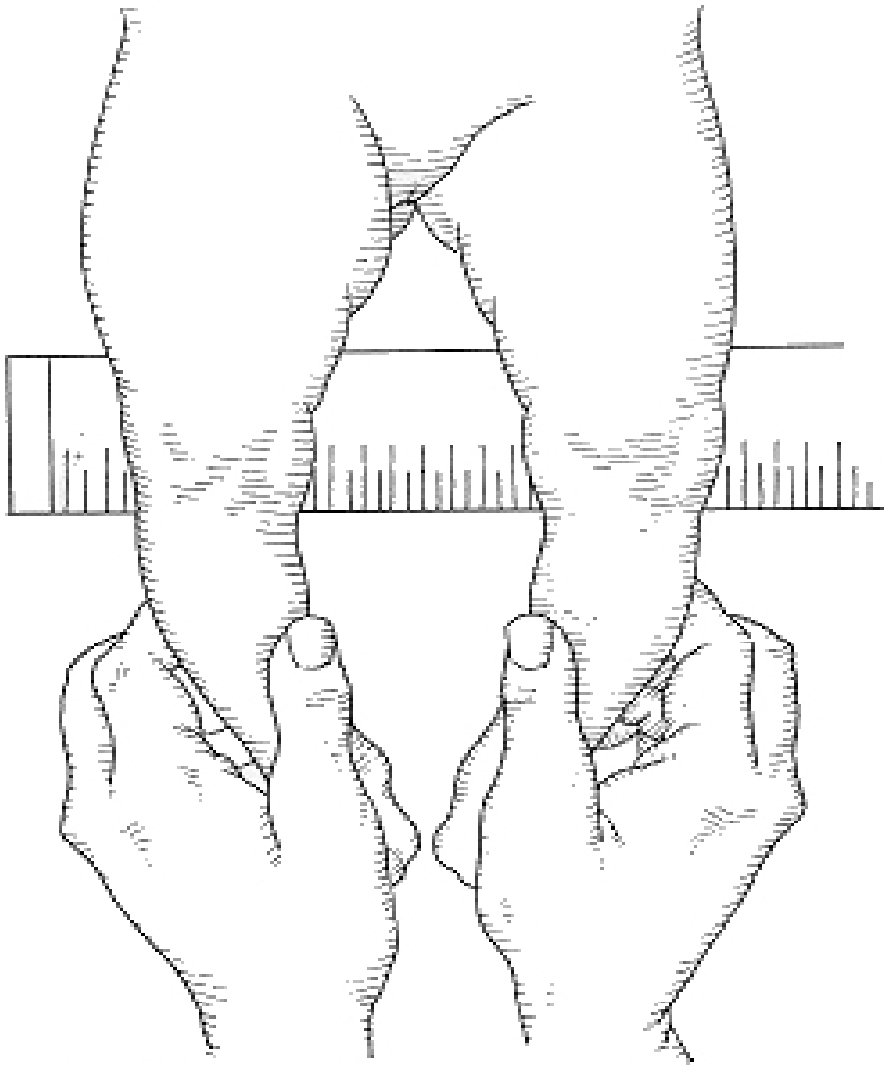
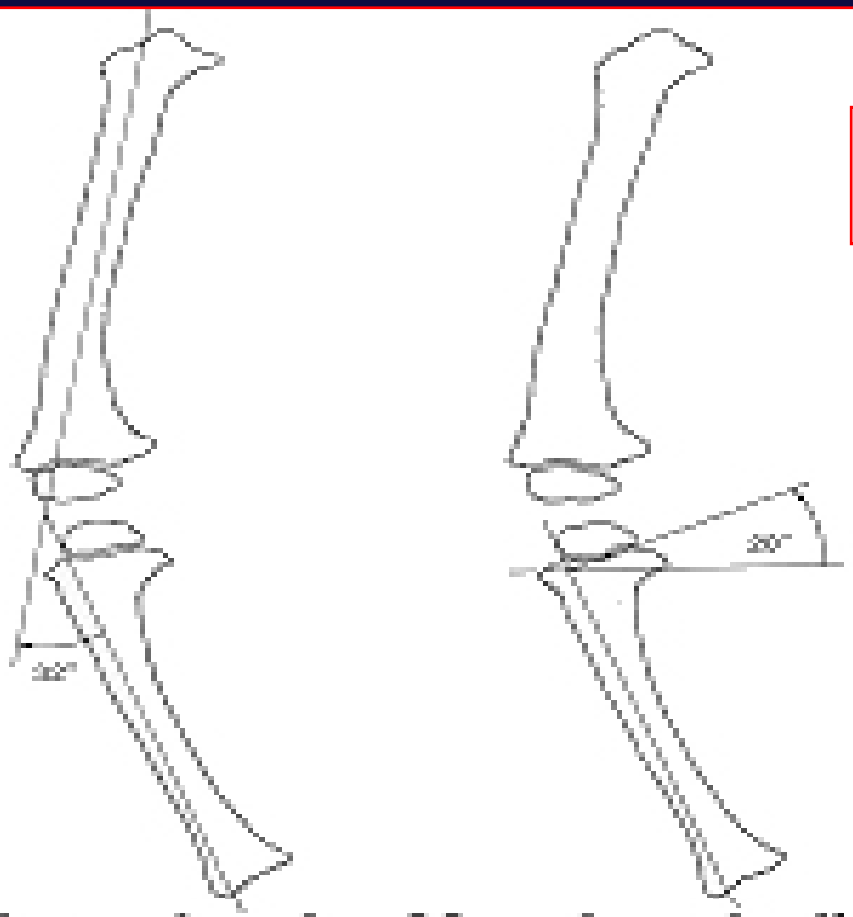


FIGURE 2 - Clinical measurement of genu varum.

Measure the angles

= A more accurate measurement → tibial femoral angle as seen on the standing AP X-ray.

= One must be careful that the legs are in **neutral rotation** when the X-ray is taken, as IR or ER will alter this angle.



N= <11 Deg.

Tibiofemoral angle Metaphyseal - diaphyseal angle

FIGURE 3 - Method of measurement of tibiofemoral and metaphyseal-diaphyseal angles from standing x-ray.

Commonly Asked Questions

1-Early walking does not cause bowed legs.

Walkers are used by
> 250,000 babies in the UK.

Physiological bowing does not require bracing or surgery.

No relation between bowlegs & O.A

The Chalange

Which is physiological ?
Which is pathological?

Diagnosis of normality : 7S.

= A Symptomatic , = Symmetrical.

= Not Severe = Suppleness **(Flexible).**

= No Skeletal dysp. (Short stature).

= No Sys. Dis. (Genetic,metabolic).

= Sequence : Bowing in infants / knock knee in young children.

1. **Bowleg > 3 y & knock-knee > 7y.**

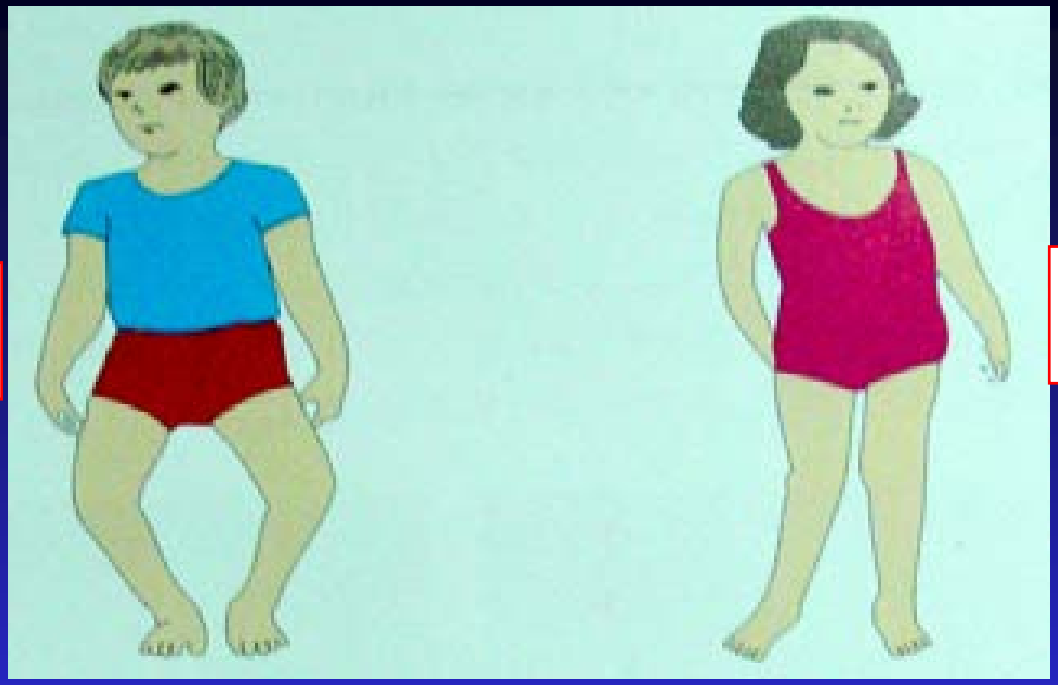
Knock-knees > 15° is abn.

2-If the IC or IM distance >3 inch, or rapidly progressing, i.e. > ½ inch within 6M.

3- Symptomatic (pain or limp)

4- Associated signs of Blount's , Rickets, or other disease synd.

Severe



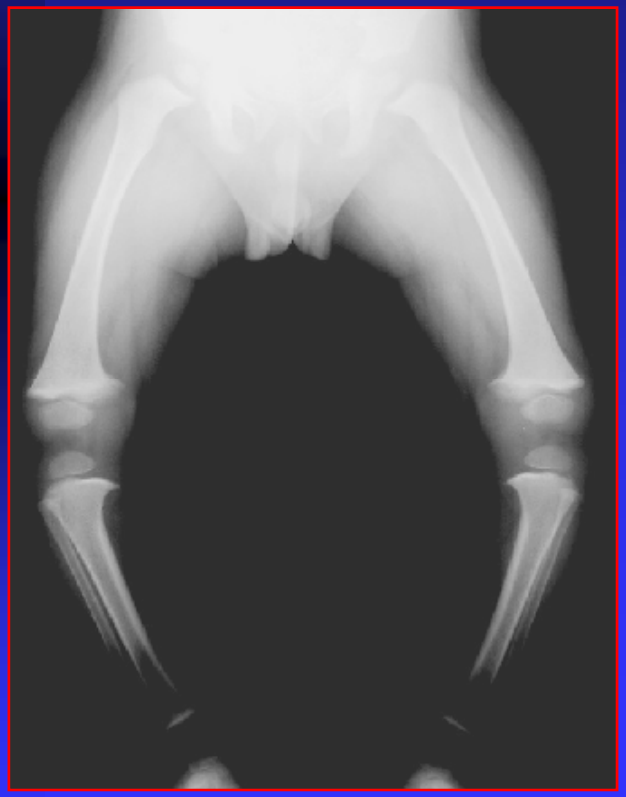
Unilat.

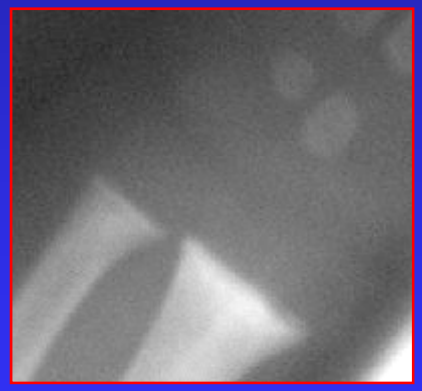
Family Hx

Short stature

Pathological Types

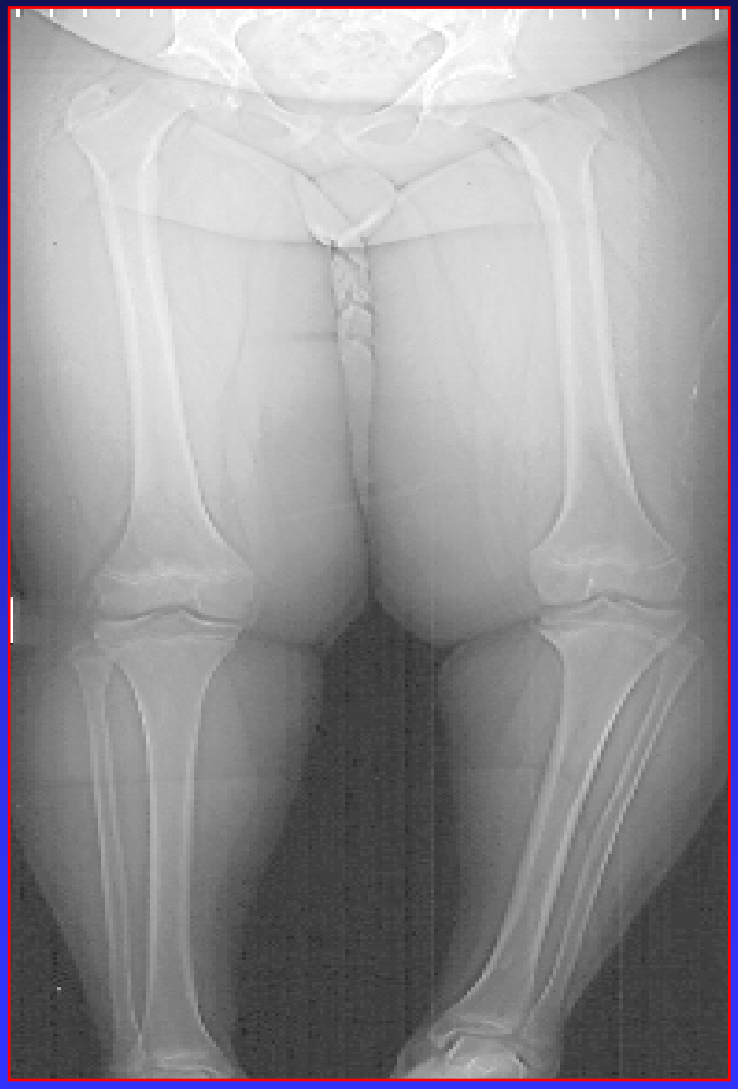
Rickets





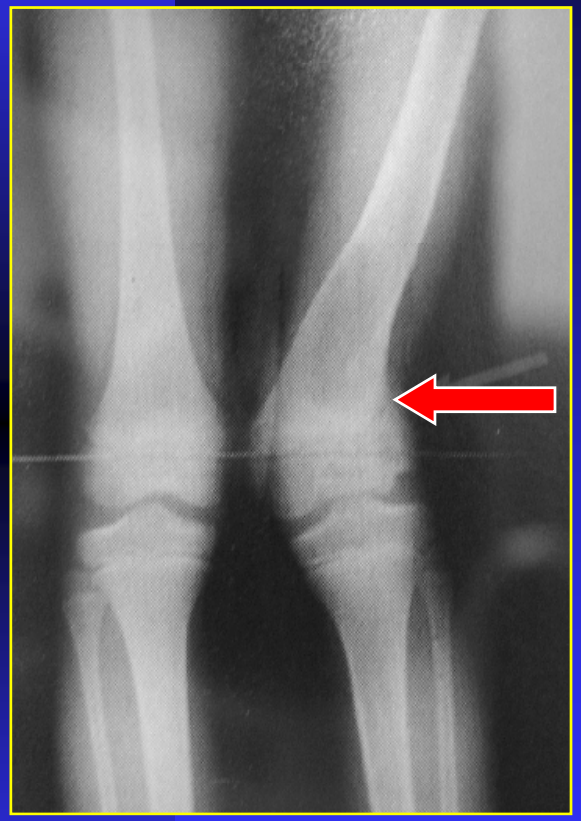
Skeletal dysplasia

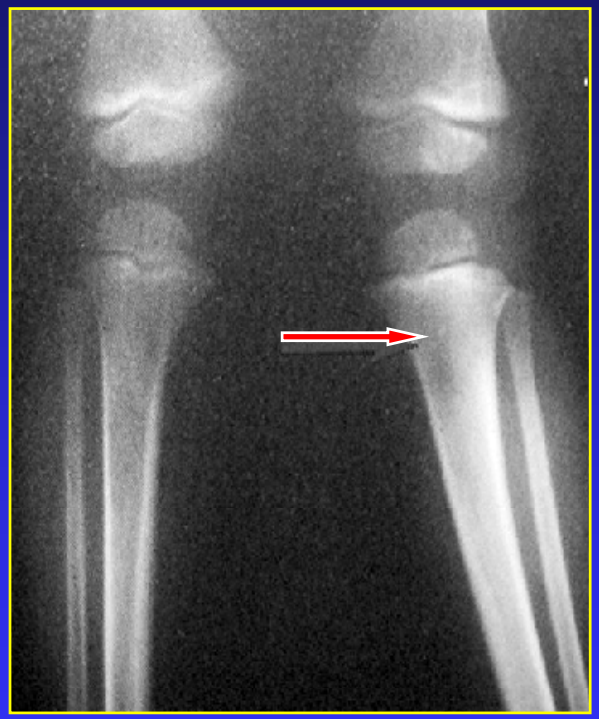
Tibia vara (Blount's dis.)



* FFC dysplasia.

Post trauma or infection





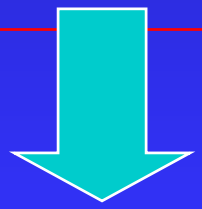
Historical Corrective Orthosis

Figure 108 Nicholas Andry (1658–1747)

Andry's Tree

Ancient Medicine & Orthopedics

= Shoe modifications
= Exercises to correct deformity
= Manipulation and encouraged posture for sitting
= Orthosis



T.B, Osteomylitis, Rickets, Polio

The occurrence of the physiological variations at that time was considered as a manifestations of serious disease

Leg braces

= Correction of the deformity.

= Delighted family

= The physician impressed

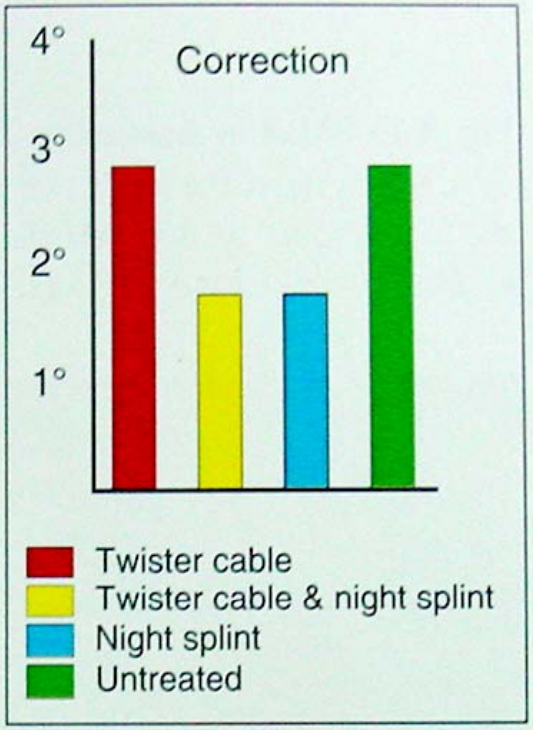
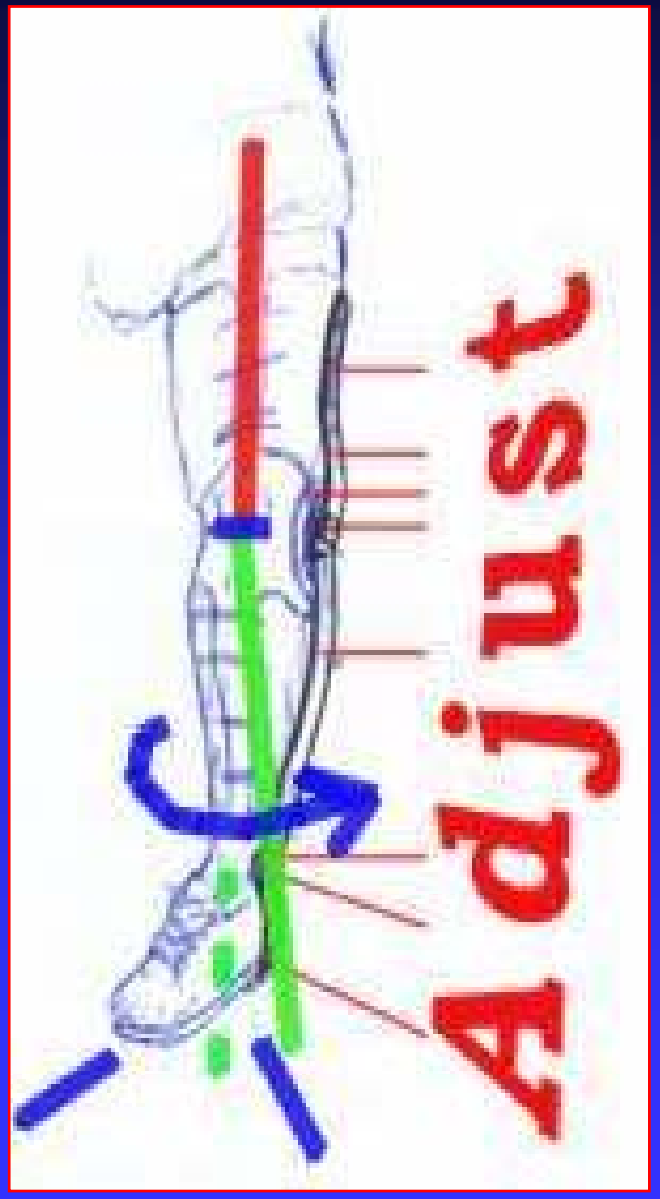


Fig. 4.21 Lack of Effectiveness of Twister Cables. The chart compares the effectiveness of various "treatments" and the "untreated" child with antetorsion. These interventions made no difference in the measured femoral anteversion before and after treatment. From Fabry, 1973.



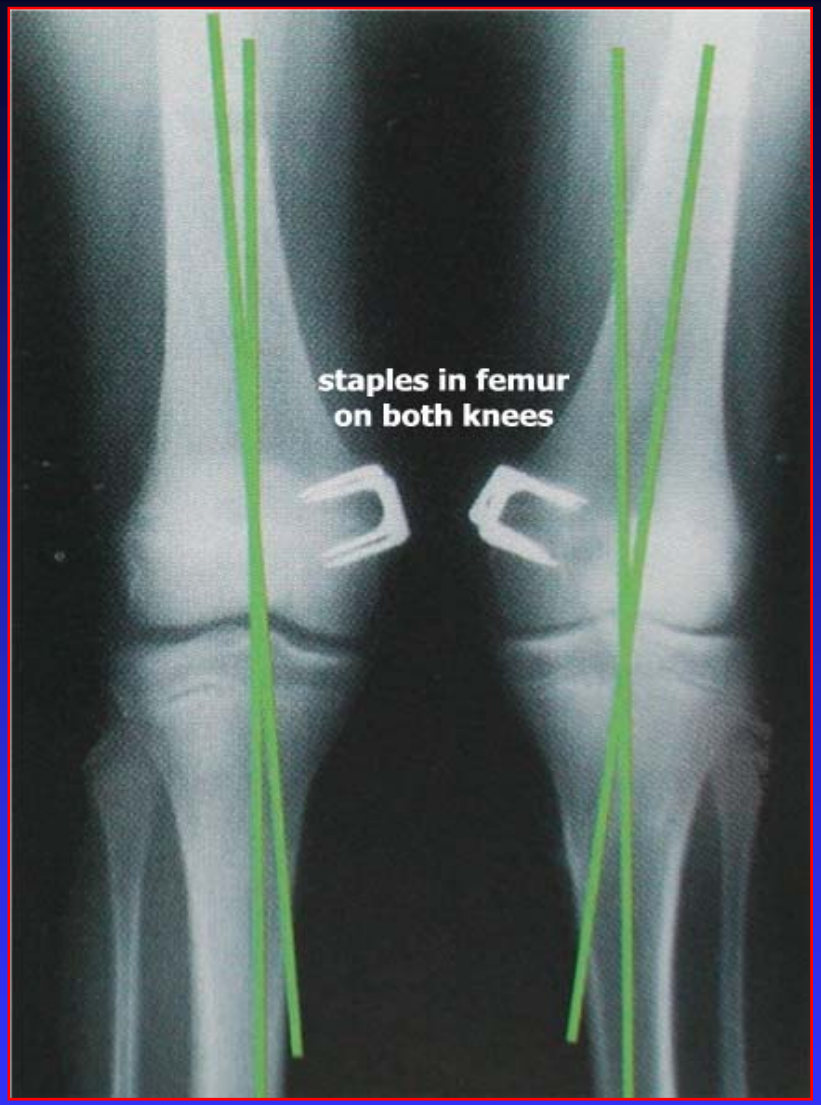
Operative Correction !!!!

= Def. outside the range.

= Significant functional & cosmetic disability.

= 0.1% .

= >10 y



Pre op. knock-knees

post op. with staples

Our observations

A prospective analysis of children with angular knee def. seen at our Pediatric Orthopedic clinic - JUH

= 155 Child

= 1-11 year

= M:F 1.12:1 (82:73)

15 Cases → Unnecessary Braces
29 = = = → Advised for braces

79 Child **65%** **15 Child**

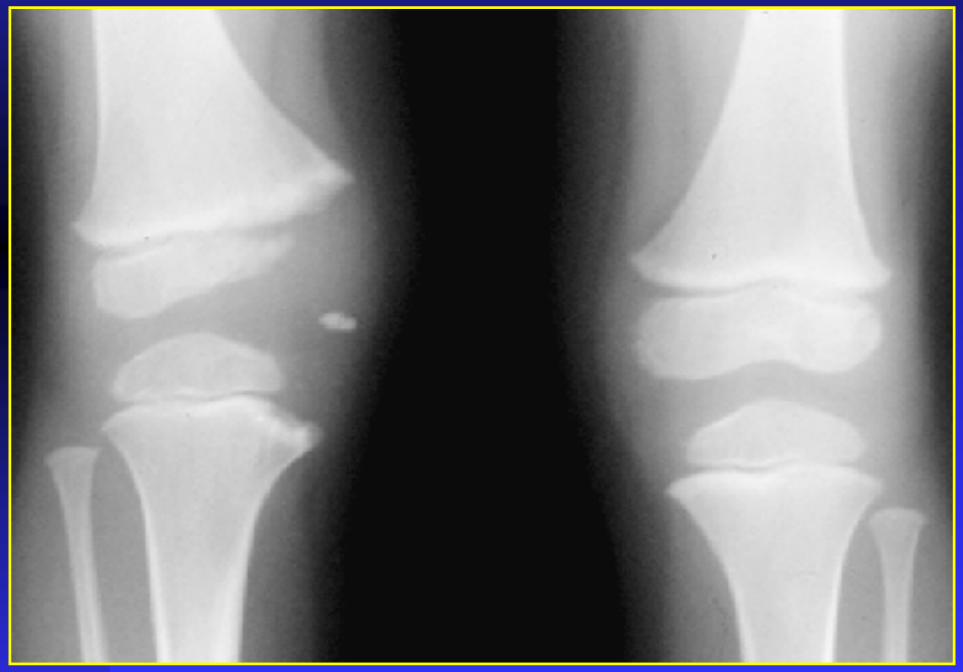
28 Child **19.25%**

12 Child 8.8%

2 Ant.lat bowing

Larsen's

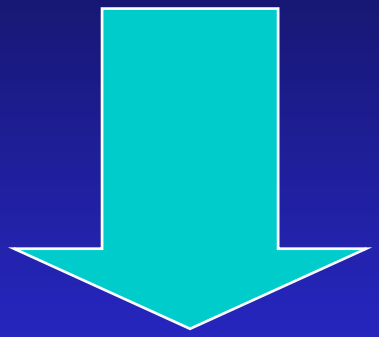
2 Osteochondroma



FFC Dysplasia

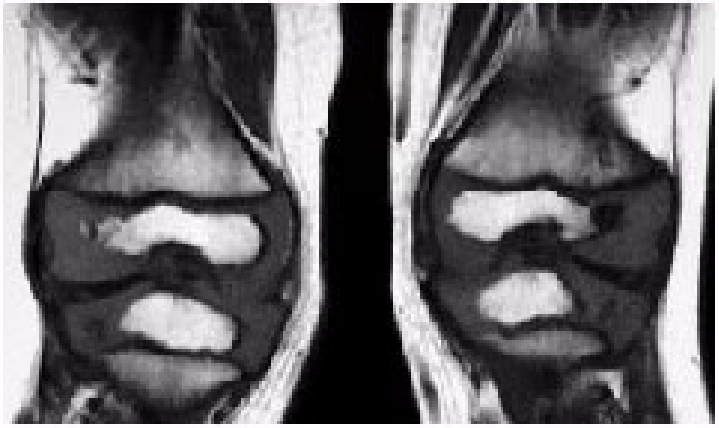
One case Post renal failure

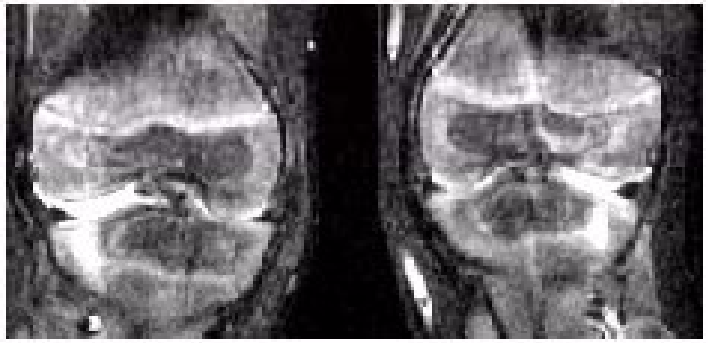
One Case Post infection



Genu Valgum deformity due to growth arrest of lat. Part of distal femur

Idiopathic





Conclusion

= Correct diagnosis & measuring severity.to exclude pathology.

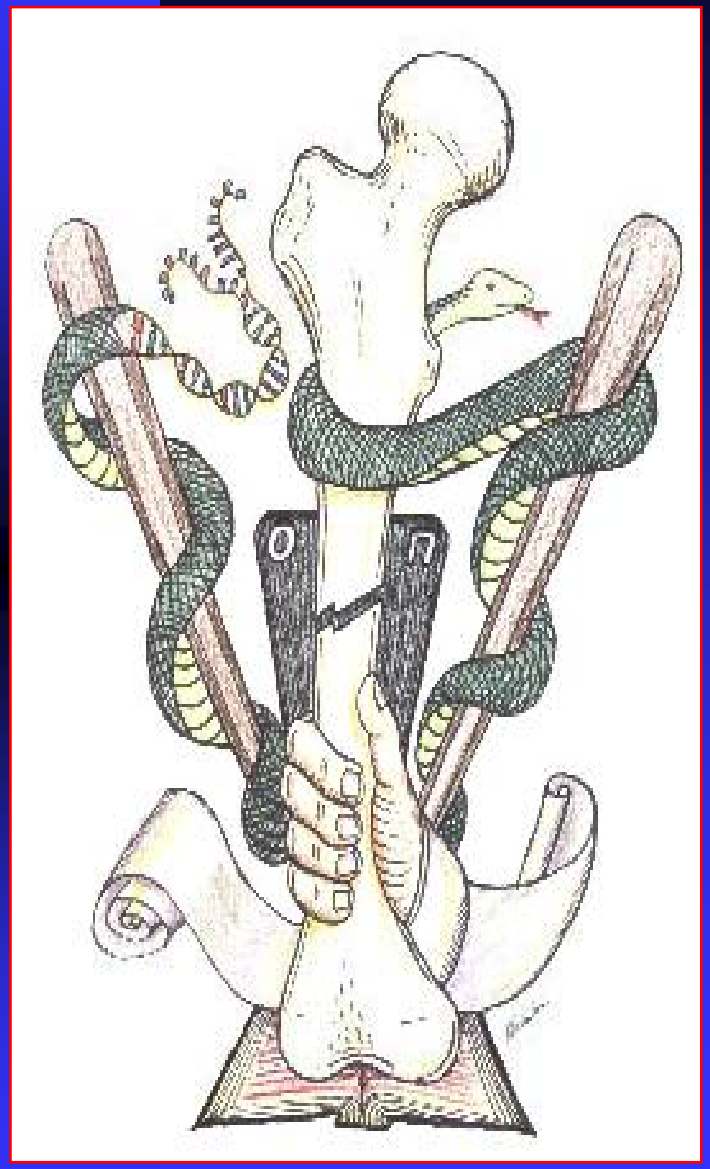
= Effective R/ of Parents worry.

= Rickets needs to be remembered


During normal development, children are bow legged and then become knock kneed. Special shoes or wedges make no difference.

= No x-rays before 2 y. of age!!

= Spontaneous resolution requires the magic of time.



THANK YOU