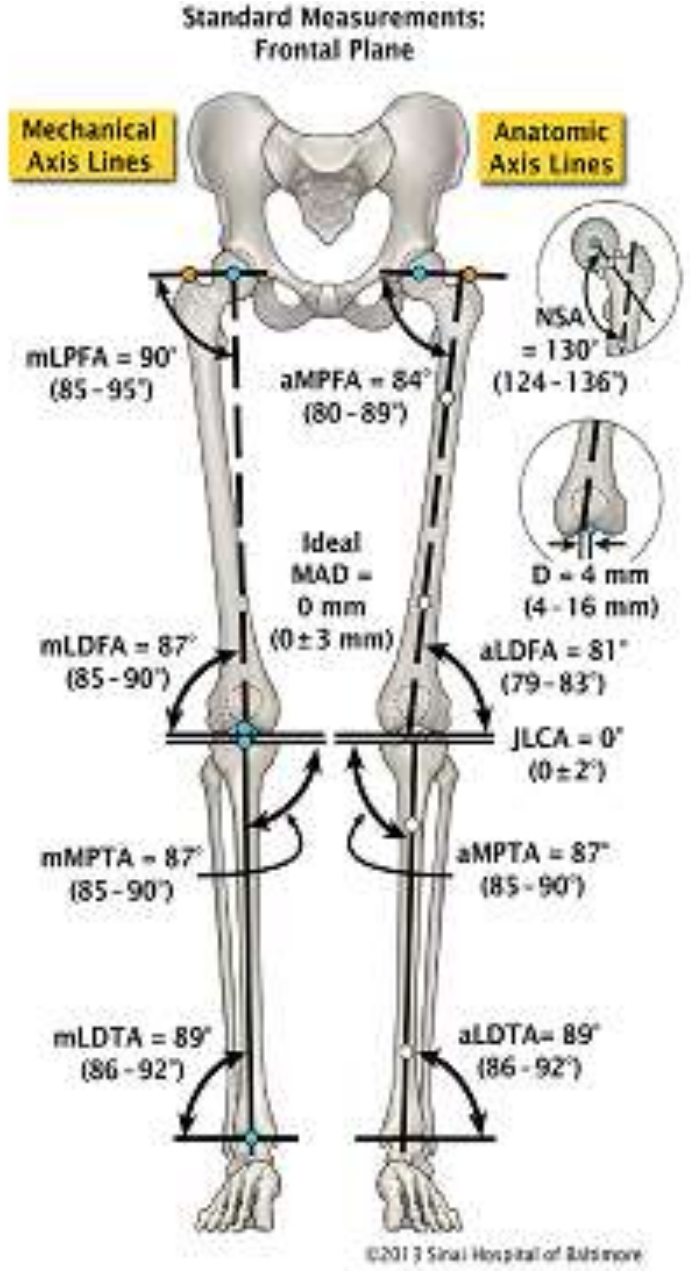
SPR teaching 8th June – Angular/Rotational deformity

Normal

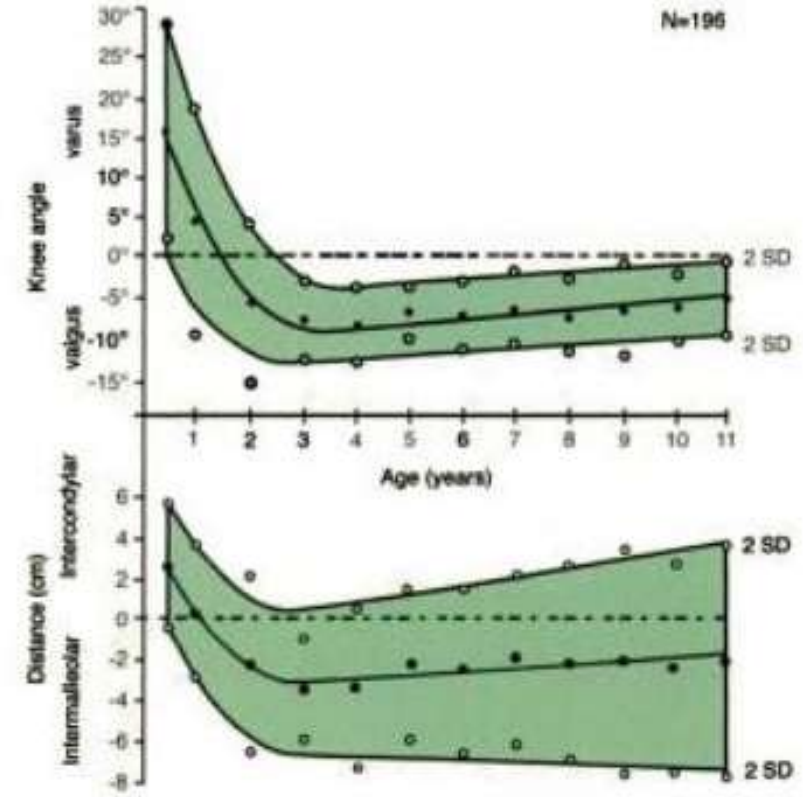
- Angles
- Varus/Valgus
- Torsion



Assessment

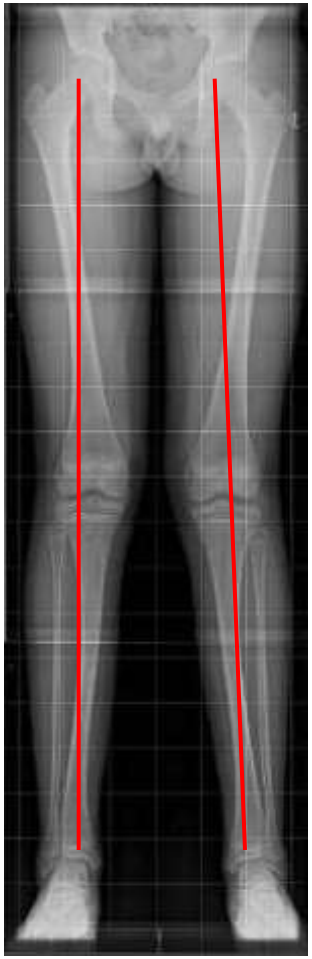
- Clinical
  - Intramalleolar distance *weightbearing or NWB?
  - Intercondylar distance
  - Rotation
- Radiographic

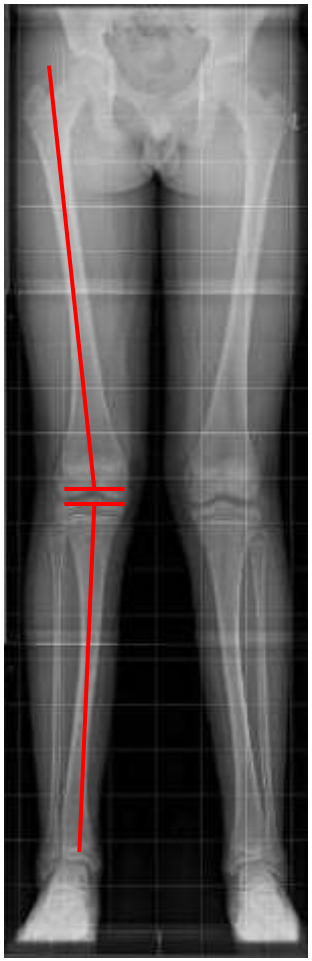
Knock knee / Bow leg

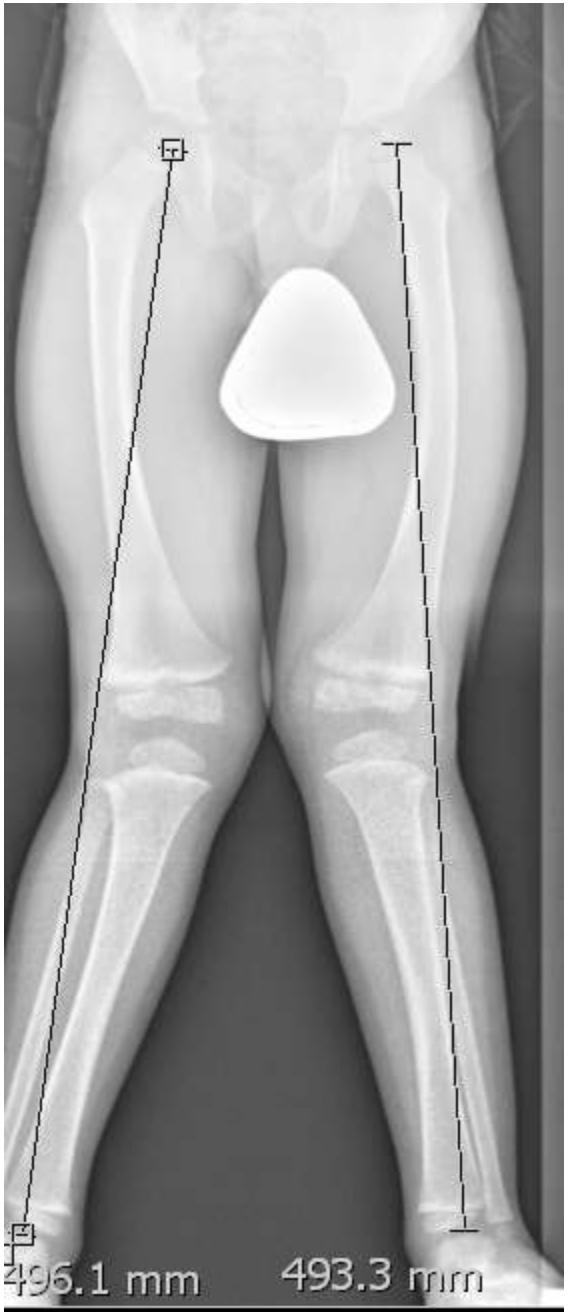


B Normal values for knee angle The normal values for the knee angle are shown in knee angle and intermalleolar or intercondylar distances. From Heath and Staheli (1993).

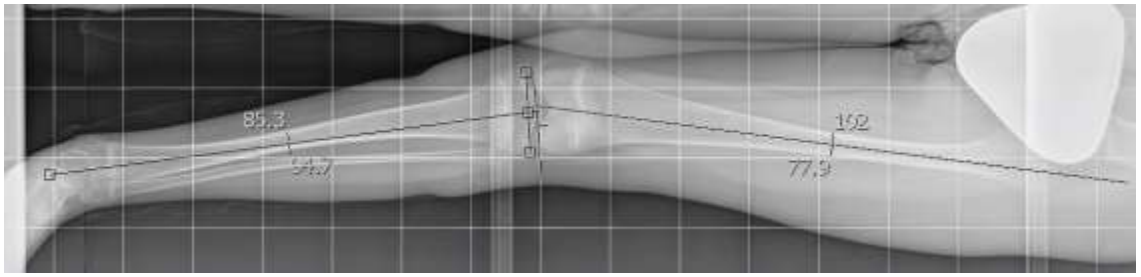
Limb alignment






496.1 mm
493.3 mm

Genu valgum
Intramalleolar distance and radiological evaluation



Physiological or pathological?

- If the knee angle or Intercondylar/intra-malleolar distance falls more than 2SD from the normal line consider further investigation
- Certain conditions can present with genu valgum/varum
  - Achondroplasia (will also have short stature)
  - Rickets
  - Growth plate arrest

In-toeing/Out-toeing

- Observe family
- Usually doesn’t bother the child at all and is purely an aesthetic problems for the parents (usually mothers)
- Excessive external rotation is much more problematic than internal rotation at a young age as the limbs naturally externally rotate with development

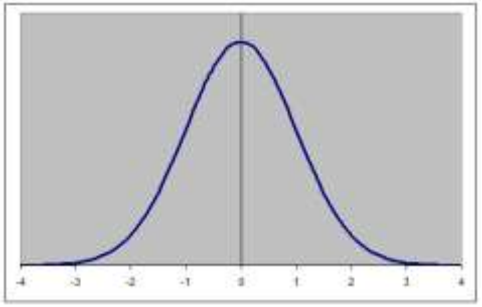
Terminology

- “version” describes the normal variation in limb rotation

  e.g. Femoral anteversion and retroversion

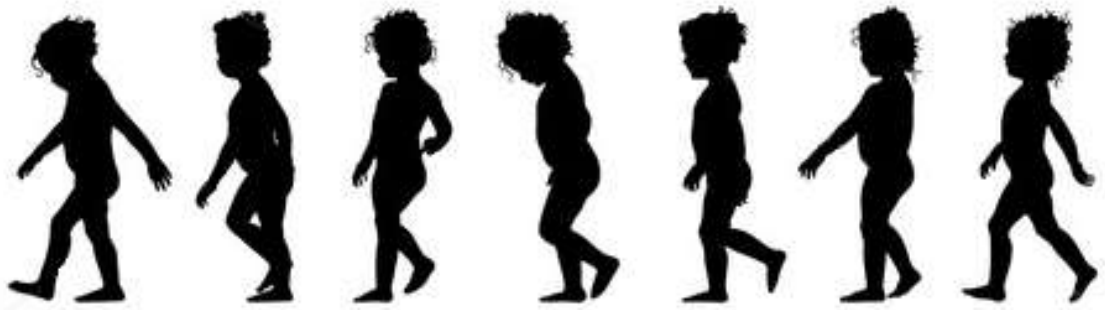
- In the “normal” the tibia is laterally rotated and the femur internally rotated

- “torsion” describes version beyond ±2SD from the mean

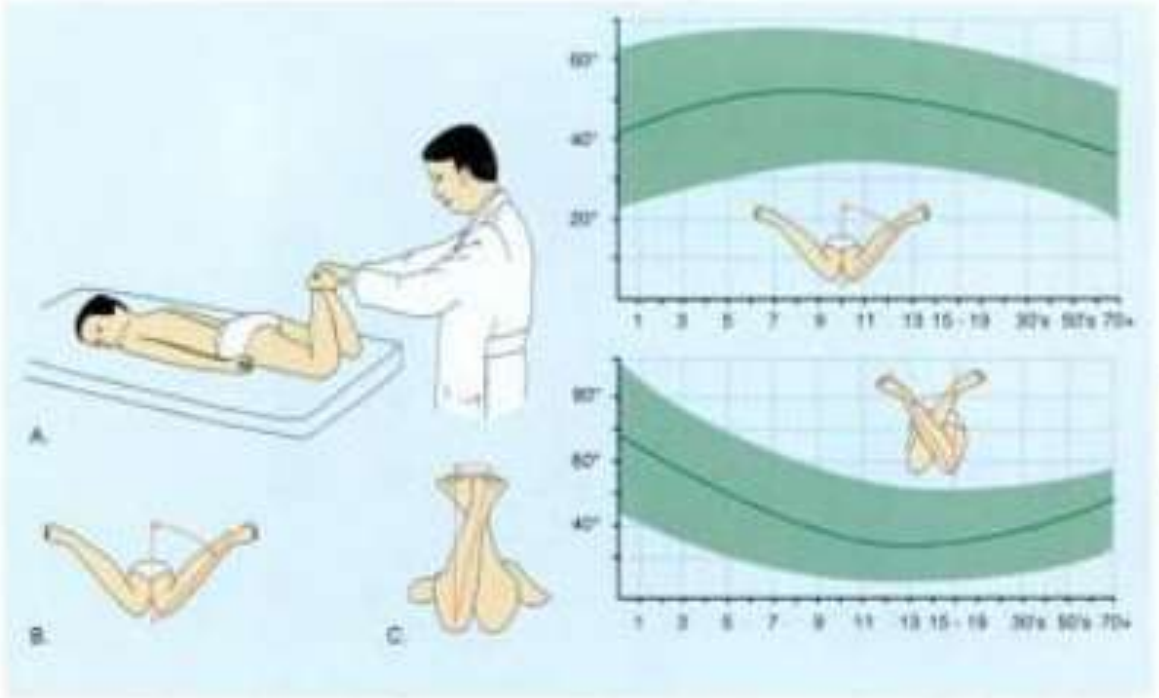


What to examine

- Foot progression angle during gait
- Hip rotation / femoral version
- Tibial version
- Foot shape

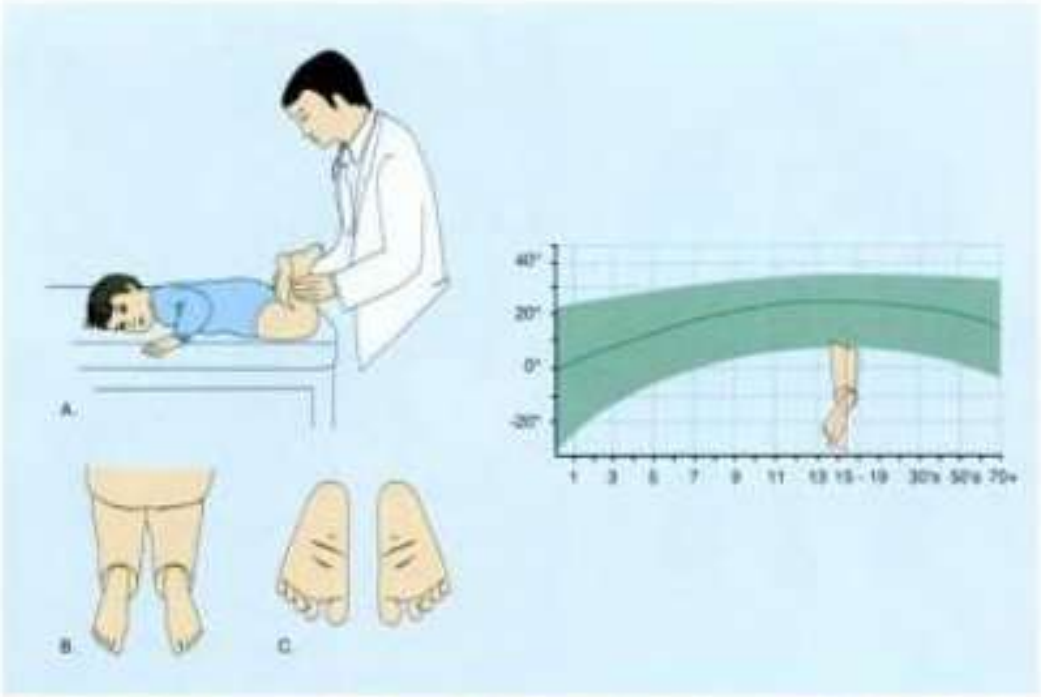


Hip & femur



B Hip rotation Hip rotation is assessed with the child prone (A). Internal rotation (B) and external rotation (C) are measured. Normal ranges are shown in green.

Tibia & foot



D Assessing rotational status of tibia and foot The rotational status of the tibia and foot are best assessed by evaluating the child in the prone position (A), allowing the foot to fall into a natural resting position. The thigh-foot axis (B) and shape of the foot (C) are readily determined. The range of normal is shown in green.

Foot shape