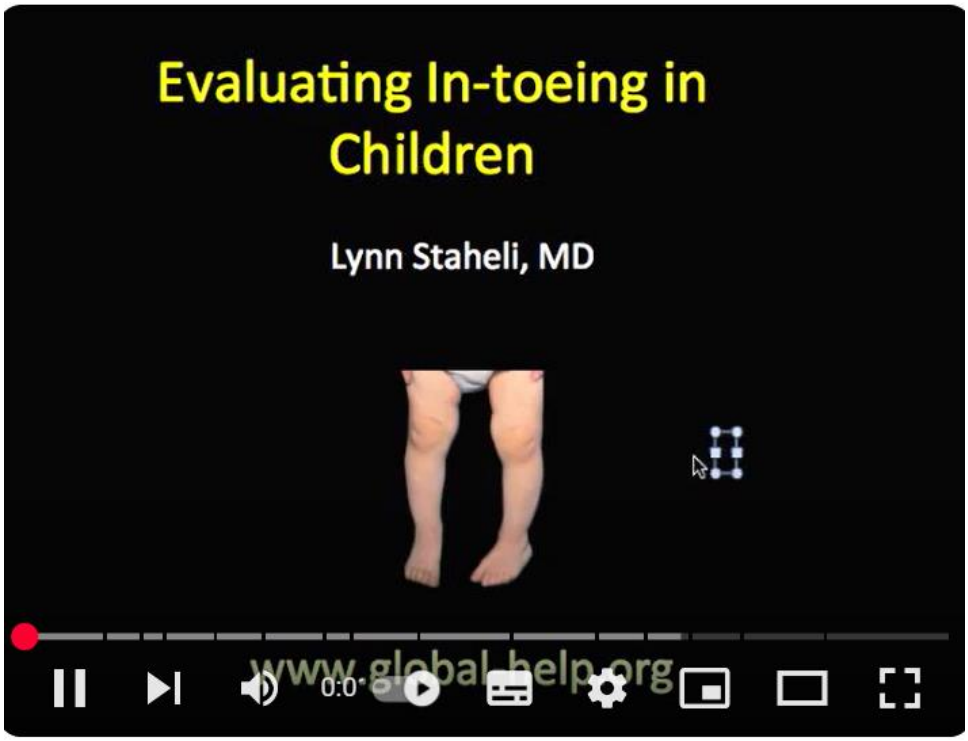
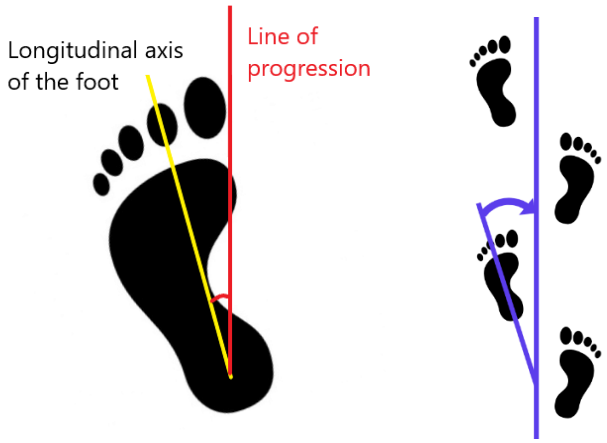


https://www.youtube.com/watch?v=kZYIKWwJn8E

Foot Progression Angle.

the angular difference between the axis of the foot and the line of progression during gait (see image).[3]

Draw a line from calcaneum to 2nd /3rd toe. Measure this from line of progression (direction of walking)



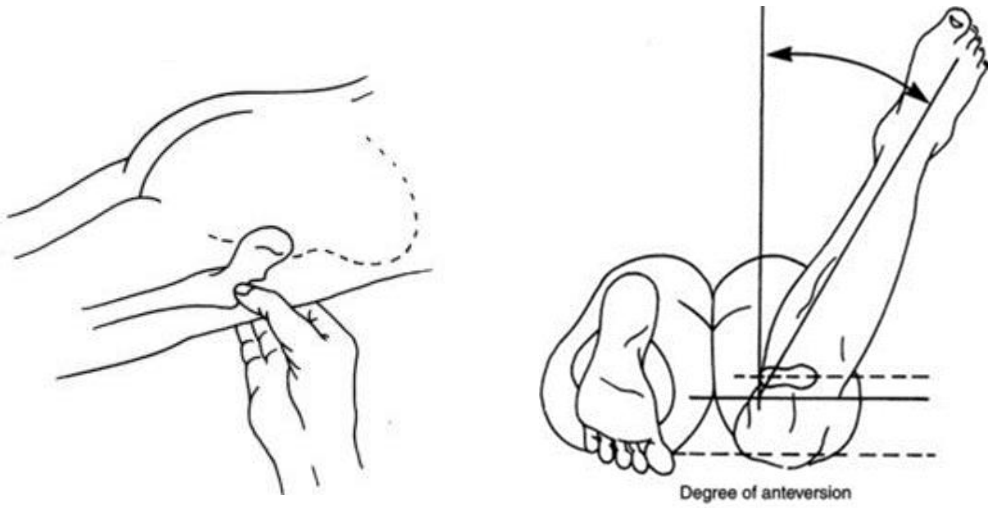
Positive values indicate out-toeing.

Negative values indicate in-toeing.

Normal is -5 to +20 degrees.

By age 8 years, >30° or <-20° indicates significant deformity.[2] and requires orthopaedic review

Craig's Test – Femoral Anteversion



Examiner with caudal hand then palpated the greater trochanter of the tested side while passively internally rotating the hip until the most prominent portion of the greater trochanter reached its most lateral position.[1][2]

One examiner holds the position of the leg in the position where the greater trochanter is the most prominent. Another examiner measures the angle between the shaft of the tibia (a line bisecting the medial and lateral malleoli) and a line perpendicular to the table (an imaginary vertical line extending from the table) using either a goniometer or inclinometer. And thus records the angle of femoral anteversion.[1][2]

Interpretation

1. **Normal**: At birth, the mean anteversion angle is 30 degrees which decreases to 8-15 degrees in adults (angle of internal rotation).
2. **Angle >15 degrees**: Increased anteversion leads to squinting patellae & pigeon toed walking (in-toeing) which is twice as common in girls.
3. **Angle <8 degrees**: Retroversion

to watch a video on craigs test – follow link https://www.physio-pedia.com/Craig%27s_Test

1. Ito I, Miura K, Kimura Y, Sasaki E, Tsuda E, Ishibashi Y. Differences between the Craig's test and computed tomography in measuring femoral anteversion in patients with anterior cruciate ligament injuries. Journal of Physical Therapy Science. 2020;32(6):365-9.
2. Choi BR, Kang SY. Intra-and inter-examiner reliability of goniometer and inclinometer use in Craig's test. Journal of physical therapy science. 2015;27(4):1141-4.

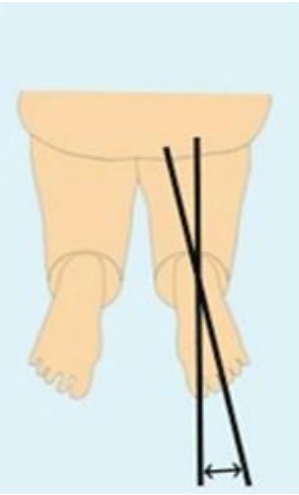
Hip medial rotation >2 standard deviations outside the mean for age

Also known as internal rotation of the hip. Femoral anteversion is indicated by increased internal rotation compared to external rotation

Eskay K. Paediatric Physiotherapy Programme. Paediatric Lower Extremity Torsional Conditions Course. Plus, 2023.

In an adolescent >70° indicates increased femoral retroversion.

Thigh-foot angle >2 standard deviations outside the mean for age



technique

- lie patient prone with knee flexed to 90 degrees
- thigh-foot-axis is the angle subtended by the thigh and the longitudinal axis of the foot

Average in infants is 5° internal (range -30° to +20°).

By age 8 years average is 10 degrees external (Ranging from -5 to 30+) {1}

20 / 30° indicates lateral or external tibial torsion,

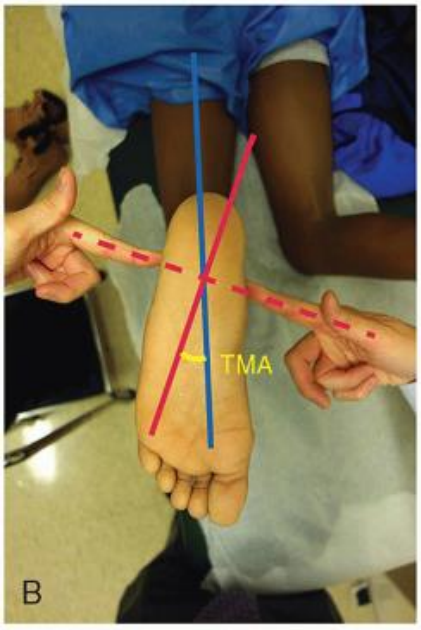
<-10° indicates medial tibial torsion.[2]

{1} https://www.orthobullets.com/pediatrics/4121/external-tibial-torsion

Transmalleolar axis >2 standard deviations outside the mean for age

Averages about 4-5° internal in newborns.

Average at 7-8yrs to adulthood is 23 degrees external. (range – 40 degrees)

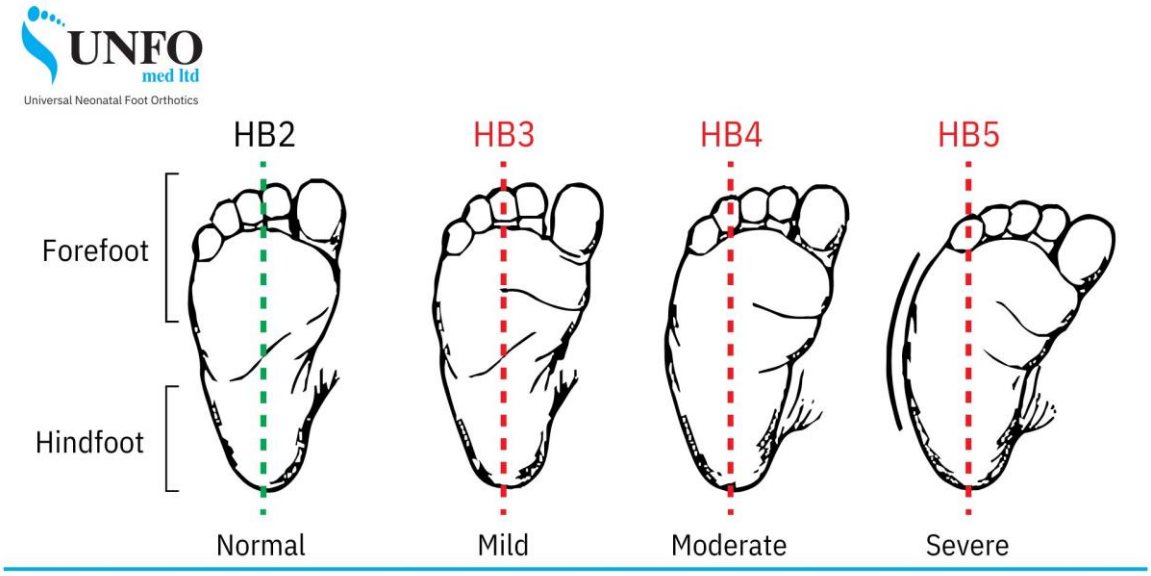


technique
an imaginary line from medial malleolus to lateral malleolus (red dotted line) and another imaginary line from medial to lateral femoral condyle is made
the axis is the angle made at the intersection of these two lines
this helps to determine the direction and extent of tibial torsion present

For TMA, a line connecting the medial and lateral malleoli is determined (dotted red line). The TMA is the angle (yellow) between a line orthogonal to this (solid red line) and the thigh axis. the child is prone and the knee is flexed 90°. The blue line represents the axis of the thigh

Heel bisector line

The heel bisector line should point towards the second toe with the lateral border of the foot being straight. Deviation of the forefoot towards the midline indicates metatarsus adductus.



The Bleck classification system is the generally accepted method of assessing the severity of metatarsus adductus. MTA is divided into three grades of severity, depending on the relation of the heel bisector line and the toes. Further classification is based on manual flexibility.

Bleck classification system:

- Normal: heel bisector line crosses between the second and third toes.
- Mild: heel bisector line passes through the third toe.
- Moderate: heel bisector line crosses between the third and fourth toes.
- Severe: heel bisector line crosses between the fourth and fifth toes.

Manual flexibility:

- Flexible: passively overcorrects the deformity.
- Partially flexible: passively corrects to the neutral position.
- Rigid : no passive correction is possible.

- Fixed contracture – cannot passively fully correct foot deformity
- Passively correctable – the examiner can fully correct the position of the foot
- Actively correctable – scratching the lateral border of the foot causes the child to turn the foot up and out themselves

References

https://musculoskeletalkey.com/limb-alignment-and-limb-length-discrepancies/

https://pediatricfootankle.com/foot-conditions/in-toeing-pigeon-toes/

https://www.orthobullets.com/pediatrics/4121/external-tibial-torsion