# Examination of rotational profile

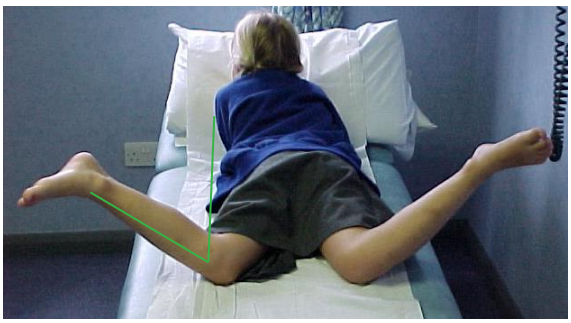
In-toeing is a very common reason for children presenting to GPs and orthopaedic clinics. The majority of children are born with 40° of femoral anteversion (in-turning of the femurs) and 5 - 10° of internal tibial torsion (in-turning of the shin bone). This commonly contributes to the normal clumsiness of toddlers as they learn to walk. During normal growth the majority of cases will straighten out to normal adult levels, and in those who do not it is very rarely a clinical problem.

**Assessment of rotational profile**

In-toeing can be caused by in-turning at the level of the hips, tibias or the feet. Examination of the rotational profile is performed as described below.

**Femoral anterversion (in-turning of the hips)**

Lie the patient prone on the examination couch with the knees bent at 90°. To measure internal rotation of the hips let both legs fall away from the midline as far as they will go. Normal internal rotation should be more than 20° from the midline. Then assess external rotation by allowing the legs to cross at the midline to see how far they will go. Normal external rotation should be more than 20°. Children commonly have a very wide arc of hip movement, but this should include 20° of external rotation and should include the knees facing forward.

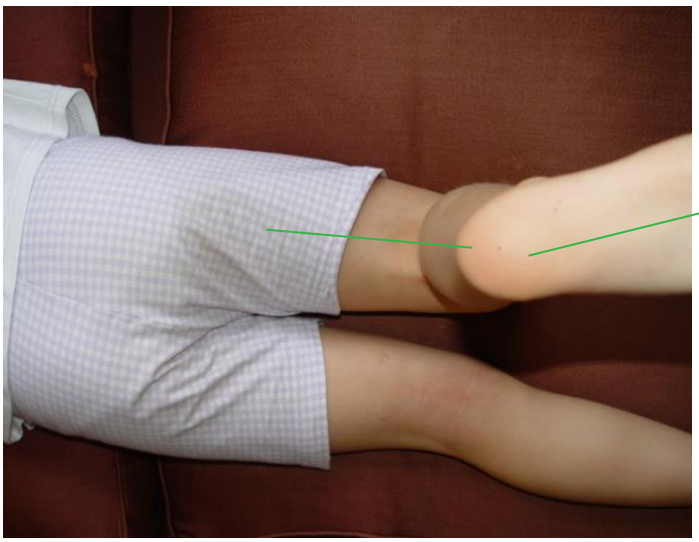


*Internal rotation*

*External rotation*

**Tibial torsion**

To assess the tibial rotation, the examiner should look for the thigh-foot angle. With the child still prone with the knees bent to 90°, a comparison is made between the axis of the femur (thigh) and the axis of the foot. If the foot points towards the midline this is internal tibial torsion. If the foot points away from the midline this represents external tibial torsion. The normal range is from 10° of internal rotation (-10°) to 15° of external rotation (+15°). We would not consider treatment unless torsion was more than 30°.



*Picture shows mild external tibial torsion*

**Foot alignment**

With the patient still prone, the foot is examined. Any curve in the shape of the foot should be noted. 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.

**Metatarsus adductus**

Metatarsus adductus (in-turning of the midfoot) can be divided into the following groups:

- 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

*Metatarsus adductus*

*Passively corrected by examiner*