What is Too Much In-toeing?

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A common concern of parents is the shape and alignment of their child's lower extremities. It is sometimes difficult for them to accept that most torsional deformities are normal for the child's age and that most deformities will resolve on their own with time.

Lower extremity positional deformities can exist at three different levels in the lower extremity. The evaluating physician always has to evaluate and examine the hip, the tibia, and the foot and ankle to determine where the "in-toeing" is coming from. The age of the child also needs to be considered because certain deformities present in certain age groups. Full evaluation must include range of motion examination of hip, knee, and foot and ankle, including evaluation of the patient's gait pattern.

Foot deformities, metatarsus adductus (forefoot turning inward), calcaneal valgus, calcaneus and clubfoot present in the newborn. Flexible foot deformities such as flexible metatarsus adductus straighten out spontaneously once the baby is kicking and moving his or her feet (85-90%). If the foot is slightly stiff, it will usually respond to the use of reverse last, straight last shoes or casting. It is rare for metatarsus adductus to be so rigid that it would require surgery.

Frequently a clubfoot treated early will respond to clubfoot casting followed by long term bracing. The more rigid clubfoot may also, in addition to casting, require a percutaneous Achilles tendon lengthening followed by casting and bracing.

Today, because the Ponsetti casting technique is being used more widely, fewer children with clubfoot deformity go on to open surgery (posterior medical release).

Toddlers frequently present with bow legs (genu varum). The role of the orthopedist in this deformity is to determine if the knee is stable. Physiological bowing can cosmetically appear severe, especially when the bowing originates in both the distal femur and the proximal tibia. Despite its cosmetically severe appearance, children with true physiological bowing have stable knees.

This bowing will straighten out by approximately age 3 to 4 years without bracing or shoe modification. It is important to educate parents that children frequently progress from a bow-legged position to knock-kneed position. This deformity also will spontaneously resolve. The more severe causes of bowing, such as nutritional rickets and Blount's disease (proximal tibial metaphyseal growth defect) are very rare. They require further work-up, including x-rays.

Femoral anteversion or medial femoral torsion is frequently the source of internal rotation in the child whose parents complain that they are "pigeon toed." This rotational deformity becomes dynamically more obvious in early to mid childhood, at a time when children begin participating in running and field sports, such as soccer or baseball. This rotational deformity frequently looks worse when children are tired or when they are running.

True femoral anteversion, however, does not get worse. The dynamic motion of running allows the leg to rotate in during the swing phase of gait, looking more extreme than when the child is walking. Femoral anteversion does not cause a child to trip or fall. Frequently, children who retain some degree of femoral anteversion are fast, powerful runners. The internal rotation posture allows for more powerful efficient push-off in running gait.

There is a wide range of normal hip internal rotation. Femoral anteversion usually spontaneously remodels to direct the leg forward. If a patient retains some degree of femoral anteversion, it will not cause degenerative arthritis of the hip or knee in later life. Bracing with the Denis-Brown bar or twister cables has been shown to have no clinical effect on this deformity.

The potential of the growing skeleton to straighten out the leg and direct the foot forward is quite dynamic. Most true positional lower extremity deformities start resolving once a child

begins walking. As long as a child has growth potential, this remodeling will continue. Some children will correct a significant amount of femoral anteversion during their adolescent growth phase. In the rare case that medial femoral torsion does not correct and it is causing functional disabilities, a surgical derotation osteotomy can be justified.

Referring a child with lower extremity torsional deformities for an orthopedic evaluation is appropriate in several situations. If the deformities appear rigid, if the deformity appears more extreme than that expected for the child's age, or if the hip, knee, or foot and ankle appear unstable, an orthopedic evaluation is indicated to rule out more severe orthopedic conditions.

It often takes time and education for a parent to gain comfort and confidence with the idea that rotational deformities will spontaneously resolve. A good source of clear information on torsional deformities can be found in a review article in the Journal of Pediatric Orthopedics (10:559-563, 1990): "Lower Positional Deformity in Infants and Children: A Review" by Lynn T. Staheli, M.D.

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