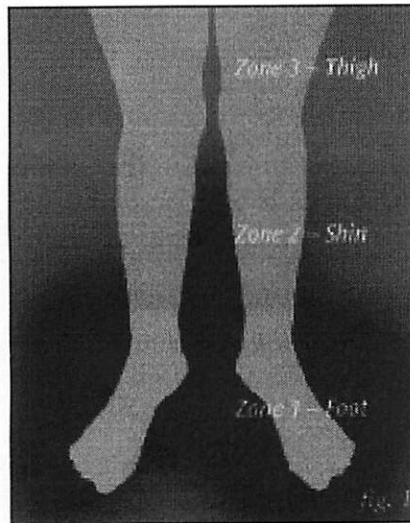


Children's Leg Problems

Spotting and treating them

Parents and grandparents often notice that the legs and feet of the new baby in the family seem to be less than perfectly straight. Does the baby need special shoes or a brace? Will the child grow up looking funny or clumsy? Children's legs are often not perfectly straight. Many variations are seen which are actually perfectly normal.

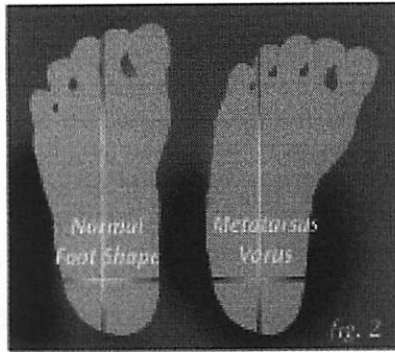
The shape of the leg is called its alignment, a trait usually inherited from a parent. Leg alignments in the normal adult population vary. There may be a slight tendency to toe-in or to toe the feet outwards. These alignments express the variations in people much the same as variations in colour of hair. If your child has a tendency to toe-in, it will be most marked at birth when the in-toeing muscles are not well balanced by the out-toeing muscles. However, as your child grows and muscle balance improves with walking, the in-toeing alignment will become less apparent. Other common alignment variations in children are bow legs, knock-knees and flat feet.



Toeing In

Toeing-in describes a method of walking where the toes or feet point inwards rather than straight ahead. The easiest way to explain toeing-in is to think of the leg as having three zones (Fig. 1). Zone 1 will be the foot, zone 2 will be the shin bone (between the ankle and the knee) and zone 3 the thigh (between the knee and the hip). One or more of these zones may be involved in causing toeing-in.

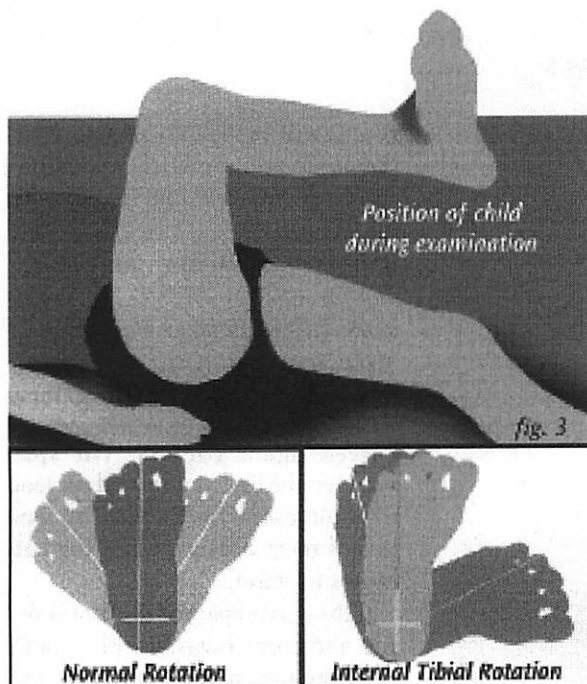
Zone 1: Foot (Metatarsus Varus)



Toeing-in which is due to a variation in the foot only is called metatarsus varus. The foot is bent inwards and curved like a banana. The space between the first and second toe tends to be increased (Fig. 2). This foot position is most obvious when the baby begins to stand. If the curved part of the foot is flexible and corrects easily with light finger pressure, it is classified as mild and will generally correct itself. If the foot is curved enough to form a crease in the arch area and requires moderate or significant pressure to correct, more in-depth treatment by a doctor is recommended.

The moderate and severe cases will require the foot to be held in the corrected position by a “straight last” shoe or leg casts. In severe cases, stretching casts will be applied to increase flexibility before the straight last shoe can be worn comfortably. The curved foot will gradually straighten as the child wears the straight last shoe. Surgical correction is rarely necessary.

Zone 2: Shin Bone (Internal Tibial Torsion)



Toeing-in may be due to the twisting inward of the shin bone, called internal tibial torsion. It can be recognized by laying the baby down with the knee bent, then turning the foot inwards and outwards (Fig. 3).

Normally the foot will turn the same distance in each direction. With internal tibial torsion, the foot can be rotated farther toward the inside and less toward the outside. When a child toes-in due to internal tibial torsion, it will become evident with walking. The feet turn inwards while the knees remain facing forward. The foot will be a normal shape.

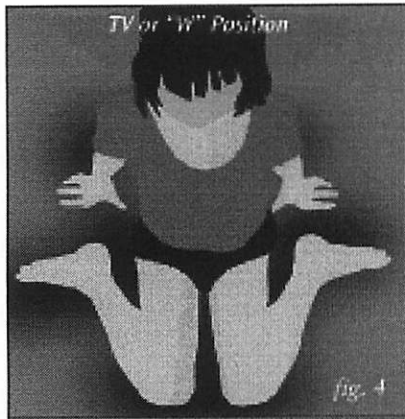
A Parent's Guide to Childrens Legs

If the internal tibial torsion is mild, it will correct itself after a year or two of walking (normally about age three years). If the torsion is moderate or severe, a doctor should be consulted.

Treatment may consist of exercises or a splint worn for about three months only at night, which helps rotate the lower leg outwards. If the outturning splint is applied before the child begins to walk, correction will occur but it will be difficult to hold because muscle imbalance is still present. When the child begins to walk however, muscle balance improves and use of the splint will be much more effective and lasting.

If the splint is used, it should be started when the child reaches walking age, continued for about 12 weeks and applied at night. During this time, increased out-turning flexibility is achieved and, hopefully, through muscle strengthening and improved muscle balance the position will be maintained. The out-toeing splints become less practical as the child gets older and are not used after age two to two-and-a-half. Balanced muscle development in the child's lower limb usually requires up to two years of active walking. Do not be surprised if a younger child toes-in more when tired, as the muscle imbalance will be more pronounced at these times. Sometimes after reasonable correction of toeing-in has occurred, the condition will seem to recur. This may happen at times of rapid growth. Improvement will occur as the growth spurt slows down and muscle balance is re-established.

Zone 3: Thigh (Femoral Anteversion)



Zone 3 toeing-in or femoral anteversion is the result of the entire leg turning inwards at the hip. The knee and the foot both point inwards. This type of toeing-in is more common in girls than boys. When it is present the child is able to sit in the “W” position or the TV position (Fig. 4). Femoral anteversion usually becomes most obvious after age six. Because the entire leg turns in, the child’s knee caps appear to have rotated inward instead of pointing straight ahead when standing or walking. When running, the style is awkward. The feet and lower legs swing out to the side, while the knees are together. This type of toeing-in worsens with rapid growth and improves as muscle strength and co-ordination catch up to the rapidly growing bone.

There are no simple treatments that are effective in correcting severe femoral anteversion. Happily it is usually mild to moderate. With maturity and increased activity, the child gains control over the lower legs and positions the feet pointing more forward.

The child is asked not to sit in the “W” position and is encouraged to participate in parallel type sports such as skiing and skating. As well, gymnastics and ballet help strengthen those muscles of the lower leg that keep it turned correctly and help to improve walking. Sports that involve prolonged running are very difficult for these children and may cause aching in the knee or foot. A knee brace may be helpful to ease ligament strain at the knee.

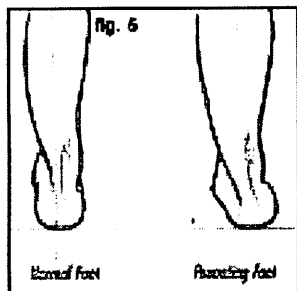
In rare instances, where femoral anteversion is severe and does not improve, surgical correction after age 10 to 12 is sometimes necessary.

The Flat Foot

The flat foot is a common cause of parental concern. Will the child have a disability in later life because of this? Will the child have sore feet? When assessing the flat foot, it should be remembered that a child’s arch does not appear until about age three. Before that age, although the arch is present, it is not visible due to a fat pad in the arch area. This makes the foot appear flat. There are two types of flat foot. The most common type is the flexible flat foot (which is often

inherited). The other type of flat foot is the rigid flat foot.

Flexible Flat Foot



The diagnosis of flexible flat foot is made by asking the child to stand on tip-toes. In this position the arch of the foot appears. When the child stands with the foot flat on the floor and is viewed from behind, the heel appears tilted and the ankle may slant inwards (Fig. 5). This foot position is called pronation and is very common among children. It can cause aching in the foot after prolonged activity and results in an abnormal shoe wear pattern. The child's shoes show excessive wear on the inside edges of the soles. The flexible flat foot or pronating foot can be divided into mild, moderate and severe. If the pronation is mild, it will correct spontaneously in early adolescence. In the moderate to severe types of flexible flat foot, sometimes treatment is necessary. It is important to begin with simple methods of management.

Running shoe design has come a long way in the past 20 years, and anti-pronation runners, such as a cross trainer or jogger are available in many styles. The runner is designed with a very strong heel cup and a very strong sole that cannot be twisted. extends from the heel cup area of the foot into the arch area. In moderate to severe forms of pronation, the child may experience aching in the arch area and have significant wear on the inside of the shoe. Sometimes arch supports or orthotics are indicated for these children.

Pronation usually gets better as the child gets older. If however, there is a family tendency towards pronation, it may persist and require lifelong support to help ease aching feet. Surgery is reserved for the severe, persistent flat foot with significant aching.

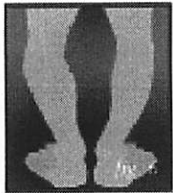
Rigid Flat Foot

The rigid flat foot comes in two varieties. The most common form is an inherited absence of the arch, pes planus. The foot is otherwise completely normal with a straight heel and ankle. With tip-toe walking, the arch does not appear. The foot functions normally, but may not be as well suited to prolonged running. An arch support placed in the shoe is painful and not well tolerated. No treatment is necessary.

The second variety of rigid flat foot is generally painful and involves either chronic inflammation

of the joints of the foot or abnormalities of the bones of the foot. The foot appears like a severely pronated foot as discussed in the previous section, but does not correct with tip-toe walking. It is painful and aches after activities. This type of foot alignment requires evaluation by a family doctor and perhaps a specialist.

Bowed leg and knocked knees



Bowed leg is defined as an alignment of the legs where there is a space between the knees when the ankles are together (Fig. 6). This is a normal alignment of the legs from the time a child begins walking until about age two years, after which the bowed legs gradually straighten without treatment.

The bow is usually present equally on both sides and gets better on both sides at the same time. In cases where a child has one bowed leg or where the bowed legs cause pain, a limp or are rapidly becoming worse, it is important to consult a doctor.

Knocked-knee is defined as an alignment of the lower legs where there is a space between the ankles when the knees are touching. This leg alignment is common between ages two and seven. The feet may show some degree of pronation (see previous section). There is gradual improvement in the condition by age seven, with a normal leg alignment occurring by the teenage years.

With moderate to severe cases of knocked knees or bowed legs, improvement may not be evident with growth. In some cases where severe malalignment persists, bracing or surgical treatment may be required to correct the leg alignment.

The appearance of the leg in the newborn child is very different from what one expects to see in adulthood. Although parents may be concerned by what they see, in most cases the legs and feet are normal and will develop as they should. When the changes in appearance are very noticeable or do not seem to fit with the age of the child as discussed in this article, you should ask your doctor about the problem. If treatment is suggested it is usually exercises, special footwear or braces and rarely requires casts or surgery.