

## **GAIT ABNORMALITIES**

Gait is the way your child walks. From their first steps, parents watch how kids walk very closely. Common concerns include:

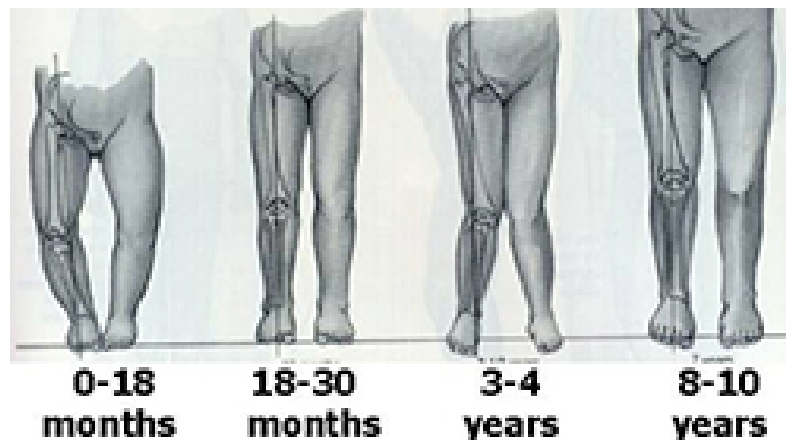
- Toes/feet turned in (intoeing)
- Toes/feet turned out (outtoeing)
- Knees turned in (knock-kneed)
- Knees turned out (bowlegged)
- Toe Walking
- Flat feet

Most of these types of gait are normal for children, especially in the few first years. They often resolve on their own over a couple of months or even years without any need for treatment, such as orthotics or physiotherapy. Surgery is an option for severe cases, but is typically not performed until age 8-10 years old. Most gait patterns are more apparent when your child is fatigued (tired).

### **Normal Progression of Gait**

At birth the position of an infant's feet are commonly turned in and this is often accompanied by a slightly bowing of the legs. This initial position tends to depend on what position the feet were in the womb. As long as the feet can easily be moved into a neutral position, nothing needs to be done and we can simply watch and observe change. Having slightly asymmetry to your infant's movements is also common when crawling or initially when walking. We often watch any asymmetric movements for up to 6 months after your child starts walking independently, assuming their check-up is normal!

Once your child starts to walk for several months, it is common to have a period of knock-knees with their feet turned in or out. This often becomes concerning for parents, but it is part of the evolution of walking. "Adult" gait patterns appear around 8-10 years of age.



### **Intoeing**

Having the toes/feet turned in can be caused by the bones in the leg (from hips down to the toes) being turned more *inwards* toward the midline of the body. Sometimes the femur (bone of the upper leg) can be rotated, and is known as

femoral anteversion. If the tibia (bone of the lower leg) is turned, it is called internal tibial torsion. And, lastly the bones of feet move inward, this is named metatarsus adductus. During the physical examination, your pediatrician will often be able to identify the affected bone. Most cases of intoeing will resolve over time without any treatment. In some cases, stretching of the foot may help. In older kids, intoeing can lead to clumsiness and more falls.

### **Outtoeing**

Similar to intoeing, having the toes/feet turned out can be caused a variety of bones in the leg (from hips down to the toes) being turned *outwards* away from the midline of the body. Sometimes the femur (bone of the upper leg) can be rotated, and is known as femoral retroversion. If the tibia (bone of the lower leg) is turned, it is called external tibial torsion. And, lastly the bones of feet move inward, this is named metatarsus abductus. During the physical examination, your pediatrician will often be able to identify the affected bone.

### **Knock-kneed**

When the knees are closer together or touch, this is called knock-kneed or genu valgum. It is often caused by the bones of the lower leg (tibia & fibula) being angled *away* from the midline of the body.

### **Bowlegged**

If their knees are further apart and there is extra space in between the legs, it is called bowlegged or genu varum. It is often caused by the bones of the lower leg (tibia & fibula) being angled *towards* from the midline of the body.

### **Toe Walking**

In most children, toe walking usually starts out as a habit. However, over time, the calf muscles can get tight, which makes it hard for the foot to be flat on the ground. You can test this by simply flexing your child's foot, moving their toes towards their head. If it's hard to move the foot, the calf muscles are tight. In this case, daily stretching exercises can be performed. Also, try to have your child wear indoor shoes in the house to help flex the foot. Sometimes, physiotherapy is needed to help stretch out the muscles.

### **Flat feet**

All children are born with flat feet, which is also known as pes planus. Arch development does not start to occur until age 3-4 years, and is often not completed until later childhood. Most flat feet are flexible – which means the feet are flat when they are on the floor, but the arch appears when the child moves onto their toes. Foot orthotics do not change the progression of flat feet in younger kids. They can be considered in older children, if they develop foot pain (which most do not).

### **Bone Health**

Proper nutrition is essential to bone health, especially calcium and vitamin D. Dairy is an excellent source of both, but a varied diet with all 4 food groups is important. In Canada, vitamin D supplements are also recommended – ask your pediatrician how much is needed for your child.

Furthermore, weight-bearing exercises help strengthen your muscles, which also helps keep your bones strong. Did you know that you develop all the bone mass for your whole life in the first 20-25 years? So talking about bone health in kids and teens is very important!