



# Pediatric Myth Busters

*common misconceptions*



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here is a lot of debate in the literature as to whether to treat the asymptomatic (or symptomatic for that matter) pediatric flat foot with foot orthoses. What I have come to accept after 25 years of experience in the fields of pedorthics, biomechanics, and physical therapy, is that when it comes to managing pediatric flat feet—*there is no universal truth!* Each situation needs to be carefully considered on a case by case basis when deciding if and how to treat each child.

In this article I will share what I fondly call my pediatric “Myth Busters”! Learning about common misconceptions related to children’s feet can help a clinician overcome unwarranted fears about treating and managing pediatric flatfeet. This article will include easy-to-understand age-specific assessment and treatment protocols for use of foot orthoses, and offer tools to help the practitioner learn how to market a pediatric program to expand their practice and become a pioneer in their community in the area of pediatric pedorthics.



## Myth Buster #1:

*“It’s ‘Normal’ For Children to Have Flat Feet”!*

Yes, it is both true and quite normal for a young ambulator (ages of 1-6) to stand and walk with pronated arches and everted (valgus) heels<sup>(1, 2, 13)</sup>. This is partially due to the fact that at birth not all of the bones of the foot are fully present or ossified. The foot of a neuro-typical child requires further postnatal development before it will achieve a state of skeletal maturity sufficient to allow for standing and ambulation<sup>(2, 13)</sup>. Also present at birth is a fat pad that fills up the space along the medial longitudinal arch of the foot that further accentuates its flatter appearance. This fat pad serves to protect the developing osseous structures of the foot from excessive load (11). Over time this fat pad is fully reabsorbed by the body and the arch should appear “normal” by ages 4-5<sup>(5, 11)</sup>.

Most children take their first steps around 9 to 15 months of age, but not all children grow and mature at the same rates. Some children may inherit skeletally-deficient feet from their parents, and at times this can lead to delayed ambulation and postural deficits that can put them at risk for future disabilities. Children with developmental delays may take longer to begin ambulating, often 16-24 months or longer. In addition, consideration needs to be given with reference to epidemiology, flexibility, gender, weight, and hypermobility<sup>(2)</sup>.

Joseph C. D’Amico, DPM, defined “Developmental Flatfoot” as an excessively pronated flexible flatfoot in the weightbearing pediatric population under 6 years of age; and describes it as a poorly functioning, posturally-deficient foot that has the potential to cause future deformity and disability<sup>(1)</sup>.

According to ACFAP president, Louis J. DeCaro (*American College of Foot and Ankle Pediatrics*), it is quite normal for a one-year-old child to stand



in 7 degrees of heel valgus. According to DeCaro, the degree of heel valgus noted on weight bearing should progressively diminish with age. A good rule of thumb to follow when assessing the "appropriate level" of heel valgus for a child is 7 minus their age. For example, it would be normal for a 3-year-old child to stand with 4 degrees of heel valgus ( $7-4=3$ ). By the time a child is 7 years of age their heels should assume a vertical alignment to the ground ( $7-7=0$ ).

Dr. DeCaro also advises that aside from skeletal issues, there are many other factors that should be evaluated that could lead to, or negatively impact, gait. These factors may include: genetics, sensory processing disorders, gross motor delays, and low muscle tone.

DeCaro states: "Overall there are 3 major factors that go into considering whether or not to treat pediatric flat foot: genetics, the age specific degree of heel eversion, and functional impairments such as endurance, fatigue and poor posture".

As the author of this article, and based on my professional experiences, I have found the "ideal" adult heel-to-floor alignment to be approximately 4-6 degrees VARUS; and that this positional alignment should be attained by adolescence (approximately ages 9-12). This moderate varus heel alignment helps to lock the midfoot, stabilize the lateral column of the foot, and encourages an effective windlass mechanism.

## Myth Buster #2:

### *"Growing Pains Are Normal"!*

When are growing pains normal? After a rapid or excessive growth period, of course! Parents and practitioners know and accept that growing pains will sometimes happen. So, how do we know when growing pains are NOT normal, or possibly excessive?<sup>(3, 7, 9)</sup>

First, consider the fact that growing pains in kids do not often occur in the foot. More commonly,

growing pains occur in the thighs, knees, or calves. Also, true growing pains usually occur at rest, such as bedtime, as opposed to during physical activity. Children are not typically very good historians and often don't express themselves well. Some kids that are experiencing pain may simply avoid activity and become more sedentary, putting them at risk of childhood obesity issues. When examining the child be sure to take a good history from their parents. Include parental questions such as did your child crawl, stand, walk, on schedule? Does your child ask to be picked up and carried frequently? Does your child hop, skip, jump, appropriately for their age?

Because the "growing pains" are not usually in the foot, it is often overlooked. Children with flat feet can experience postural deficits that make it much harder for them to function efficiently. An overly pronated foot causes the heels to evert in standing, the talus to plantarflex and adduct, and the tibia and femur to internally rotate. Pronated feet overstretch the posterior tibialis, the deltoid ligament, the plantar fascia, and many other deeper ligamentous structures. This creates a mechanically unstable foundation (foot), further compromising knee, hip, pelvic, and back alignment <sup>(12, 14)</sup>.

Children suffering from chronic, severe, or frequent growing pains should be screened for foot pathology or overpronation. Implementing free pediatric foot screening in your clinics, at sporting events, or in school systems is a great way to promote foot health awareness and simultaneously market your business. Learning when and how to manage excessive childhood foot pronation could potentially prevent lifelong pathology and dysfunction.

## Myth Buster #3:

*"Children Outgrow Flat Feet!"*

Many times parents are told to wait it out – After all kids outgrow flat feet right? Not always! Genetics plays a big role in that determination. If one or more of your parents has flat feet, you too may end up with flat feet, and may possibly pass this trait on to your children. We inherit all of our bodily features: hair color, eyes, cheek bone structure, body frame, and as well—the shape of our feet. So if you want to know if a child will outgrow their flat feet, then look at their parents' and siblings' feet. If there is a hereditary pattern in the family, it may be wise to consider orthotic intervention to prevent future disability, particularly if there is a familial history of foot or lower limb problems such as bunions, or other musculoskeletal conditions.

## Age Specific Parameters for Pediatric Foot Development

- A child begins to walk around 10-14 months of age, at which time up to 6° heel valgus is considered normal
- Calcaneal valgus diminishes by 1° per year until age 6 at which time the heel should be vertical
- By age 13 a youths foot will take on its final adult form and the calcaneus will ideally be inverted 4-5°





## Side Tip:

*I love to take photos of families' feet: I call them family "Pho-taes".*

It is both fun and interesting to share these images with families and point out that their children can look characteristically similar to one of their parents – just by looking at their feet! This exercise is engaging and interactive and gets the entire family involved.

## Myth Buster #4:

*"Using Foot Orthoses Causes Dependency on Them!"*

I often hear parents tell me they have their children walk barefooted in order to "strengthen" their ankles. Although there may be true benefit to a structured therapeutic exercise program under the direction of a trained physical therapist, athletic trainer, or exercise physiologist, prolonged barefoot walking on an overpronated foot may at times exaggerate the deformity<sup>(4, 12, 14)</sup>. Flatfeet can lead to excessive muscle elongation of the foot supinators and can cause muscle spindle inhibition and increased production of sarcomeres. The change in muscle length alters the length–tension curve of a muscle and creates a "stretch weakness", or "positional weakness", that is associated with overuse injuries and postural dysfunction<sup>(6, 8)</sup>.

A pediatric foot orthosis is recommended when a child's foot pronation is deemed excessive for their age, especially when associated with a familial history of foot-related conditions. The orthoses should include a deep heel cup (30mm), conservative medial rearfoot posting, a medial skive, and medial and lateral flanges<sup>(4)</sup>. Because of rapid growth it is not always possible, nor is it necessary,

to use custom foot orthotics. Prefabricated orthotics that incorporate these features will often suffice and are a more affordable alternative for parents that may (because of genetics) have a gaggle of flatfooted kids to treat! Remember, when treating kids with orthoses you do not always have to achieve perfection. Medially post the rearfoot just enough to bring the foot back to the child's age-related heel alignment. For example, remember that it is normal for a 5-year-old child to stand in 2 degrees heel valgus ( $7-5=2$ ). So, if you are treating a 5-year-old child that stands in 5 degrees heel valgus, you need only post 3 degrees to bring them back to their age-related 2 degrees heel valgus position.

Russel Volpe, DPM and professor at the NY College of Podiatric Medicine offers the following guidelines to help ascertain the need to medically manage a child with a flatfoot<sup>(13)</sup>:

- Symptoms associated with abnormal foot posture
- A non-physiologic flatfoot at any age
- Abnormal weightbearing position of the foot based on age and associated abnormal foot posture
- Changes in dynamic function in gait associated with flatfoot

## Summary:

Foot pronation is often “normal” in younger children but should be outgrown by the age of 6 years. Excessive pronation in toddlers, or persisting flatfootedness in preteens and adolescents, can perpetuate lifelong disability if left untreated; this can often be easily managed with OTC devices. Realigning the foot with an orthosis has many benefits, including optimizing structural alignment to secure a stronger foundation for the body, facilitating better muscle functioning and strength, improving balance and coordination, and preventing present and future pathology.

For more immediate information, please email: [robertanstride@gmail.com](mailto:robertanstride@gmail.com); or sign up for a webinar on “Pediatric Practice Pearls for Treating Developmental Flat Feet” at: <http://www.nolaro24.com/education.html>



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